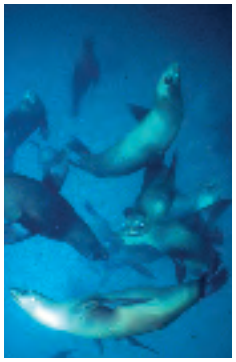
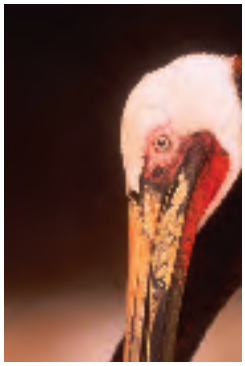
Channel Islands
National Marine Sanctuary





Final Management Plan/
Final Environmental Impact Statement

Volume II of II:
Final Environmental Impact Statement

November 2008

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
PROGRAM PLANNING AND INTEGRATION
Silver Spring, Maryland 20910

NOV 25 2008

Dear Reviewer:

In accordance with provisions of the National Environmental Policy Act of 1969 (NEPA), the National Oceanic and Atmospheric Administration (NOAA) has enclosed for your review the Final Environmental Impact Statement (FEIS) for the Channel Islands National Marine Sanctuary (CINMS). This FEIS assesses the environmental and socio-economic impacts of the revised regulations for the Channel Islands National Marine Sanctuary. The CINMS is located offshore from Santa Barbara and Ventura Counties in southern California. Designated in 1980, the CINMS 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.

This FEIS is prepared pursuant to NEPA to assess the environmental impacts of the revisions to the regulations for the CINMS. The revisions are being made pursuant to section 304(e) of the National Marine Sanctuaries Act, which requires periodic review of substantive progress toward implementation of the management plan and goals for the sanctuary.

NOAA held public hearings and provided opportunity for public comments on the draft environmental impact statement and proposed rule from May to July 2006 and from March to May 2008. All comments received are addressed in the document you are receiving.

Although NOAA is not required to respond to comments received as a result of issuance of the FEIS, any comments received will be reviewed and considered for their impact on issuance of a record of decision (ROD). Please send comments to the responsible official identified below. The ROD will be made available publicly following final agency action on or after January 5, 2008.

Responsible Official: Chris Mobley
Channel Islands National Marine Sanctuary Superintendent
Office of National Marine Sanctuaries
National Oceanic and Atmospheric Administration
Channel Islands National Marine Sanctuary
113 Harbor Way, Suite 150
Santa Barbara, CA 93109
805-966-7107 ext.465

Sincerely,

for Paul N. Doremus
NOAA NEPA Coordinator

Enclosure(s)

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ABOUT THIS DOCUMENT

This Final Environmental Impact Statement (FEIS) is Volume II of the management plan for the Channel Islands National Marine Sanctuary (CINMS or Sanctuary). Volume I, the Final Management Plan (FMP), contains information about the Sanctuary's environment and resources, staffing and administration, priority management issues and actions proposed to address them over the next five years, and performance measures. Volume II, the FEIS, evaluates the potential environmental impacts of the Sanctuary's proposed actions, *i.e.*, the proposed revisions to CINMS regulations. The Sanctuary's proposed actions and several other alternative actions are described in section 2 of this FEIS. The National Oceanic and Atmospheric Administration (NOAA) is the lead agency for this proposed project.

This FEIS has been prepared in accordance with the National Environmental Policy Act of 1969, as amended (NEPA), 42 U.S.C. 4321 *et seq*., and its implementing regulations, 40 CFR parts 1500–1508. The Notices of Intent (NOI) to prepare this EIS (64 FR 31528; 72 FR 40775) are provided in Appendices A.1 and A.2 of this document.

This FEIS was prepared with the assistance of Tetra Tech, Inc., 4213 State Street # 100, Santa Barbara, 93110.

Comments or questions on this document should be directed to:

Michael Murray
Management Plan Coordinator
Channel Islands National Marine Sanctuary
113 Harbor Way, Suite 150
Santa Barbara, California 93109
(805) 966-7107
michael.murray@noaa.gov

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EXECUTIVE SUMMARY

This Final EIS (FEIS) evaluates the potential environmental impacts associated with proposed revisions to the regulations for the Channel Islands National Marine Sanctuary (CINMS or Sanctuary), offshore California. The National Oceanic and Atmospheric Administration (NOAA) is the lead agency for this proposed project.

This FEIS has been prepared in accordance with the National Environmental Policy Act of 1969, as amended (NEPA), 42 U.S.C. 4321 *et seq*., and its implementing regulations, 40 CFR parts 1500–1508. The FEIS presents, to the decision maker and the public, information required to understand the potential environmental consequences of the proposed action and alternatives.

This FEIS incorporates changes made in response to public and agency comments received on the DEIS issued in May 2006 and Supplemental DEIS (SDEIS) issued in March 2008, and incorporates information contained within the SDEIS.

1.0 BACKGROUND

Under the National Marine Sanctuaries Act, as amended (NMSA), 16 U.S.C. 1431 *et seq*., the Secretary of Commerce (Secretary) is authorized to designate and manage areas of the marine environment as national marine sanctuaries. Such designation is based on attributes of special national significance, namely conservation, recreational, ecological, historical, scientific, cultural, archaeological, educational, or aesthetic qualities. The primary objective of the NMSA is to protect marine resources.

In addition to the NMSA itself, resource protection for national marine sanctuaries is carried out by regulations under the National Marine Sanctuary Program[1] (NMSP), which are codified at 15 CFR part 922. The mission of the NMSP "is to identify, designate and manage areas of the marine environment of special national, and in some cases international, significance due to their conservation, recreational, ecological, historical, research, educational, or aesthetic qualities" (15 CFR 922.2(a)).

Designated in 1980, the CINMS consists of an area of approximately 1,128[2] square nautical miles (nmi) off the southern coast of California. The Sanctuary boundary extends seaward to a distance of

[1] 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.

[2] From 1980 to 2007, the area of CINMS was described as approximately 1252.5 square nautical miles. However, adjusting for technical corrections and using updated technologies, in 2007 NOAA re-calculated the original CINMS area as approximately 1113 square nautical miles (72 FR 29208). This change did not constitute a change in the geographic area of the Sanctuary but rather an improvement in the estimate of its size. Also in 2007, NOAA designated the federal portion of the Channel Islands marine protected area (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 original boundary of the CINMS in four locations, increasing the overall size of the Sanctuary from approximately 1,113 square nautical miles to approximately 1,128 square nautical miles. This approximately 15 square nautical mile increase 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.

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 (collectively the Islands). Located offshore from Santa Barbara and Ventura counties in southern California, the Sanctuary hosts a rich and diverse range of marine life and habitats, unique and productive oceanographic processes and ecosystems, and culturally significant resources.

2.0 PURPOSE AND NEED

The Sanctuary's terms of designation and regulations were published in the Federal Register in 1980 (vol. 45, No. 193), and the original management plan was completed in 1983. No formal review or revision of the management plan or Sanctuary regulations has occurred since that time. Congress, however, has amended the NMSA numerous times, strengthening and clarifying the conservation principles for the program. The amended NMSA calls upon the NMSP to review the management plan of each sanctuary in five-year intervals and to revise the management plan and regulations as necessary to fulfill the purposes and policies of the NMSA (16 U.S.C. 1434(e)).

Sanctuaries are the subject of management plan review in order to:

- Evaluate the substantive progress toward implementing the management plan and goals, especially the effectiveness of site-specific management techniques and strategies;
- Determine revisions as may be necessary to the management plan and regulations;
- Prioritize management objectives; and
- Inform the general public and Sanctuary constituents about the Sanctuary and management strategies planned for future years.

For the CINMS, there are additional reasons for revising the original management plan. Since its designation as a national marine sanctuary, significant advances in science and technology, as well as innovations in marine resource management techniques, have rendered the original 1983 CINMS management plan and its corresponding EIS significantly outdated. Furthermore, new threats to Sanctuary resources have emerged that require new approaches in CINMS resource management. In addition, the original management plan did not contain performance indicators to help evaluate the effectiveness of either the CINMS or the NMSP. A new management plan is needed to reflect these changes and to guide actions that can achieve effective conservation and management of Sanctuary resources.

The CINMS management plan review began with public scoping in 1999. Following the public scoping process, sanctuary staff, public forum groups, the CINMS Sanctuary Advisory Council (SAC), and NMSP leadership contributed to the identification of nine priority resource management issue categories to be considered in the new management plan: water quality, public awareness and knowledge of the Sanctuary, research and monitoring, enforcement, boundary redefinition, human uses (recreational, commercial, military), marine reserves, marine mammal and seabird protection, administrative issues (performance standards, improved inter-agency coordination). Staff further refined these issue categories and focused the development of action plans and regulatory changes upon priority resource management issues.

The DEIS was widely circulated in order to solicit public comments on the document. A 64-day public review period was provided following publication of the DEIS. Public hearings were held no sooner than 30 days after the Notice of Availability was published in the Federal Register and at least 15 days before

the end of the comment period. In addition, a Supplemental DEIS (SDEIS) was issued in March 2008 to address revisions to the proposed discharge prohibitions. A 63-day public review period was provided for the SDEIS. During the public comment periods, oral and written comments were received from federal, state, and local agencies and officials, organizations, and interested individuals. A summary of these comments and the corresponding responses is included in this FEIS in Appendix B, including responses to comments on the SDEIS.

After this FEIS is issued, there will follow a 30-day mandatory waiting period, after which NOAA may issue its Record of Decision and publish its final rule.

The final management plan (FMP) addresses many resource management issues through nine action plans: Public Awareness and Understanding, Conservation Science, Boundary Evaluation, Water Quality, Emergency Response and Enforcement, Maritime Heritage, Resource Protection, Operations, and Performance Evaluation. In addition, the proposed regulatory changes analyzed in this FEIS also address several priority resource management issues and were developed to facilitate improved "on the ground" Sanctuary management of such issues. Furthermore, both the proposed changes presented in this FEIS, as well as the in the FMP, are needed to meet the goals and mission of the NMSP (15 CFR 922.2(b)). The FMP and FEIS are packaged as a two volume set (the FMP is Volume I and the FEIS is Volume II).

This FEIS has been prepared because revisions and updates to the outdated portions of the 1980 CINMS terms of designation are proposed. The terms of designation provide the terms of a sanctuary's designation, *i.e.*: the geographic area to be designated a national marine sanctuary, the characteristics that give the area particular value, and the types of activities that will be subject to sanctuary regulation to protect those characteristics. Proposed updates and other revisions to the CINMS terms of designation include replacing the term "seabed" with "submerged lands of the Sanctuary" to be consistent with the NMSA, clarifying that the Mean High Water Line marks the Sanctuary's shoreline boundary, and modifying the Sanctuary's scope of regulations to enable the NMSP to address current priority issues via Sanctuary regulations. To meet the requirements of the NMSA, which states in section 304(a)(4) that "the terms of designation may be modified only by the same procedures by which the original designation is made," the NMSP is preparing an EIS (one of the requirements of a designation), regardless of whether one would be required under NEPA.

3.0 SCOPE OF THE EIS

This FEIS evaluates the environmental impacts associated with the proposed revised regulatory action and alternatives to the proposed action. The Proposed Action in this EIS consists of revising existing Sanctuary regulations and adopting several new regulations. An alternative to the Proposed Action consists of a regulatory package with slight variations in the proposed regulations. Regulatory changes contained within the preferred alternative (*i.e.,* the Proposed Action) and Alternative 1 are outlined below, described in detail in section 2 of this FEIS, and analyzed in terms of impacts in section 4 of this FEIS. In addition, a No-Action Alternative (*i.e.,* no changes to regulations) is also analyzed in this FEIS.

In addition, this FEIS presents proposed changes to the Sanctuary's terms of designation (see section 2.1.17). The CINMS terms of designation were originally set in 1980 upon establishment of the Sanctuary, and per the NMSA describe the geographic area proposed to be included within the Sanctuary, the characteristics of the area that give it conservation, recreational, ecological, historical, research, educational, or esthetic value, and the types of activities that will be subject to regulation by the Secretary to protect those characteristics (16 U.S.C. 304(a)(4)). In order to implement many of the regulatory changes included in the Proposed Action, the NMSP would need to modify the Sanctuary's terms of designation describing types of activities subject to Sanctuary regulation. Additional proposed changes

to the terms of designation include: an updated and more accurate description of the Sanctuary area and characteristics of the area that give it particular value, greater clarity on the applicability of Sanctuary emergency regulations, and an updated explanation of the effect of Sanctuary authority on preexisting leases, permits, licenses, and rights. While at least most of the proposed regulatory changes presented in this FEIS do not meet the NEPA environmental impact statement test of constituting a major federal action significantly affecting the human environment, such as wording clarifications to existing regulations, these proposed regulatory changes are nonetheless presented and assessed within this EIS because they relate to associated proposed changes to the Sanctuary's terms of designation. Under the NMSA (16 U.S.C. 1434(a)(4)), alterations to the terms of designation require the Sanctuary to go through the same procedures as site designation, including preparation of an EIS.

This EIS analyzes regulatory changes, not the action plans proposed in the FMP (Vol. 1). The FMP action plans describe non-regulatory management strategies and actions that Sanctuary staff would use to address various issues identified during the management plan review process. Nested within each action plan is a series of strategies, each of which contains detailed actions Sanctuary staff would take over the next five years in order to meet CINMS goals and objectives. These strategies comprise activities ranging from program planning, budgeting, administrative services, mapping, vessel and aircraft operations, to basic and applied research and monitoring activities, education and outreach services, and advisory body activities. The NMSP has determined that the proposed actions within the FMP (Vol. I) individually and cumulatively are administrative in nature and have no potential for significant impact on the environment. Thus, the FMP's planned activities are not analyzed within this FEIS.

During 1999 public scoping meetings members of the public frequently raised issues relating to Sanctuary boundary expansion and marine zoning; however, an assessment of these issues is beyond the scope of this EIS. The FMP (Vol. I) includes a Boundary Evaluation Action Plan describing the Sanctuary's separate and future planned environmental review processes to address this matter. This action plan outlines a future supplemental environmental review process designed to yield a future decision on whether to modify the Sanctuary's outer boundary. The supplemental environmental review process will be NEPA-compliant and will result in a supplemental EIS (SEIS) and supplemental management plan. Thus, the proposed regulations addressed in this EIS would only apply to the existing CINMS boundaries, while the applicability of Sanctuary regulations to various boundary alternatives will be evaluated in the SEIS. Regarding marine reserves, in 2007 NOAA completed a separate NEPA analysis and rulemaking process (72 FR 29208) to complete the Channel Islands marine protected area (MPA) network by augmenting the marine protected areas established by the State of California in 2003. As such the consideration of Sanctuary boundary expansion and marine zoning is outside the scope of this EIS.

4.0 REVISIONS TO DEIS AND INCORPORATION OF SUPPLEMENTAL DEIS

This FEIS incorporates changes to the DEIS based on comments received during the DEIS public comment period, based on changes analyzed in the SDEIS, and comments received during the SDEIS public comment period, and based on the NMSP's subsequent review. A small number of technical and grammatical edits were made to the document as well as updates to certain sections of the ecological and socioeconomic analyses. Between May and July of 2006, NOAA received public comment and held two hearings on the DEIS and proposed rule. Between March and May 2008, NOAA received public comment on the SDEIS and proposed rule. NOAA received over 700 comments on the DEIS, SDEIS, and proposed rules. A list of regulation changes to the DEIS' proposed action is provided below, followed by a description of several complex changes to the discharge regulation and Sanctuary boundary description. FEIS section 2.1 explains each regulatory change included in the revised proposed action.

Regulation changes made to the DEIS' proposed action include the following:

- Discharge and deposit regulation: modified graywater exception to apply only to vessels less than 300 gross registered tons (GRT), and oceangoing ships (300 GRT or more) without sufficient holding tank capacity to hold graywater while within the CINMS;

- Discharge and deposit regulation: modified treated sewage exception to apply to vessels less than 300 GRT, as well as to oceangoing ships without sufficient holding tank capacity to hold sewage while within the Sanctuary;

- Added defined terms for "cruise ship," "oceangoing ship" and "graywater"; and

- Removed the proposed outer boundary coordinate corrections, and removed the proposed corrections to the legal description of the Sanctuary area based on recalculations of the Sanctuary's size.

After receiving comments on the DEIS, NOAA determined that the original range of alternatives needed to be modified to better address potential impacts of sewage and graywater discharges from large vessels. Thus, the SDEIS modified the range of regulatory changes under consideration and discussed the potential environmental consequences of a revised discharge/deposit regulation. NOAA has incorporated the revisions to the discharge/deposit regulation analyzed in the SDEIS into the FEIS' revised proposed action. In addition, based on comments received on the SDEIS, NOAA decided to further modify the prohibition on discharging or depositing sewage from within or into the Sanctuary. The revised regulation would now provide that the exception for treated sewage is applicable to small vessels (less than 300 GRT), as well as to oceangoing ships (proposed to be defined in the CINMS regulations as private, commercial, government, or military vessels of 300 gross registered tons or more, not including cruise ships) without sufficient holding tank capacity to hold sewage while within the Sanctuary. As per the analysis in the SDEIS, the revised discharge/deposit regulation would also amend the exception to the prohibition on discharging or depositing graywater from within or into the Sanctuary. The revised regulation would provide that the exception for graywater is only applicable to small vessels (less than 300 GRT), and to oceangoing ships without sufficient holding tank capacity to hold graywater while within the Sanctuary.

In 2007, NOAA made technical corrections to the CINMS boundary coordinates, re-calculated the original CINMS area as approximately 1,113 square nautical miles (72 FR 29208), and increased the Sanctuary area by approximately 15 square nautical miles to allow the boundary of four marine reserves to be defined by straight lines projecting outside the original CINMS boundary, allowing for better enforcement of the marine reserves. This change did not constitute a change in the geographic area of the Sanctuary (other than the approximately 15 square nautical miles referred to above) but rather an improvement in the estimate of its size. NOAA originally intended to make technical corrections to the Sanctuary boundary coordinates and re-calculate the CINMS area (provided at 15 CFR 922.70) as part of the CINMS management plan review EIS and rule. However, since NOAA made the technical corrections and re-calculated the CINMS area in 2007 as part of the FEIS and final rule to establish marine reserves and conservation areas within the Sanctuary, these aspects of clarifying the Sanctuary boundary description are not included in this FEIS' proposed action.

5.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

The Proposed Action consists of adopting revisions to the existing regulations plus adoption of several proposed new regulations. An alternative to the Proposed Action (Alternative1) consists of a regulatory package with slight variations to the proposed regulations and one additional proposed new regulation. A No-Action Alternative would consist of leaving the current regulations unchanged.

Revisions to existing Sanctuary regulations included in the Proposed Action would:

- Clarify that Sanctuary boundaries encompass the submerged lands and that the Mean High Water Line marks the Sanctuary's shoreline boundary;
- Remove outdated and unnecessary oil spill contingency equipment requirements;
- Clarify that discharges allowed from marine sanitation devices apply only to Type I and Type II marine sanitation devices;
- Provide that the discharges allowed from Type I and Type II marine sanitation devices are only allowed from vessels less than 300 GRT, and from oceangoing ships without sufficient holding tank capacity to hold sewage while within the Sanctuary;
- Provide an exception for graywater discharge from vessels less than 300 GRT, and from oceangoing ships without sufficient holding tank capacity to hold graywater while within the Sanctuary;
- Define "cruise ship," "oceangoing ship" and "graywater";
- Provide an exemption for discharges by vessels of the Armed Forces allowed under section 312(n) of the Federal Water Pollution Control Act;
- Specify that the existing exception for discharging or depositing fish, fish parts, or chumming materials (bait) applies only to such discharges or deposits during the conduct of lawful fishing activity within the Sanctuary;
- Remove an exception for discharging or depositing meals on board vessels;
- Prohibit discharges or deposits of any material or other matter from beyond the boundary of the Sanctuary that subsequently enter the Sanctuary and injure a Sanctuary resource or quality;
- Extend from 2 nmi to the outer 6 nmi Sanctuary boundary the existing prohibition on alteration of the submerged lands of the Sanctuary;
- Prohibit vessels of 300 gross registered tons or more (excluding fishing and kelp harvesting vessels) from approaching within 1 nmi of the Islands;
- Revise and strengthen the existing protection of cultural/historical resources to prohibit moving, possessing, injuring, or attempting to move, remove, injure or possess any Sanctuary historical resource;

- Clarify, update and refine the regulation of Department of Defense activities occurring within the Sanctuary to, among other things, provide more consistency with the NMSA as currently written; and

- Conform wording, where appropriate, to wording used for more recently designated sanctuaries.

New regulations included in the Proposed Action would prohibit:

- Exploring for, developing, or producing minerals within the Sanctuary, except producing by-products incidental to authorized hydrocarbon production;

- Abandoning any structure, material, or other matter on or in the submerged lands of the Sanctuary;

- Taking any marine mammal, sea turtle, or seabird within or above the Sanctuary, except as authorized by the Marine Mammal Protection Act, as amended, (MMPA), 16 U.S.C. 1361 *et seq*., Endangered Species Act, as amended, (ESA), 16 U.S.C. 1531 *et seq*., Migratory Bird Treaty Act, as amended, (MBTA), 16 U.S.C. 703 *et seq*., or any regulation, as amended, promulgated under the MMPA, ESA, or MBTA;

- Possessing within the Sanctuary (regardless of where taken from, moved, or removed from) any marine mammal, sea turtle, or seabird, except as authorized by the MMPA, ESA, MBTA, or any regulation, as amended, promulgated under the MMPA, ESA, or MBTA;

- Marking, defacing, damaging, moving, removing, or tampering with any sign, notice or placard, whether temporary or permanent, or any monument, stake, post, or other boundary marker related to the Sanctuary;

- Introducing or otherwise releasing from within or into the Sanctuary an introduced species; and

- Operating a motorized personal watercraft within waters of the Channel Islands National Park, established by 16 U.S.C. 410(ff).

In addition, the Proposed Action includes revised and clarified Sanctuary permit regulations that would:

- Add specificity to and slightly expand on the types of activities for which the Director of the NMSP may issue permits;

- Specify which otherwise prohibited activities would not be allowed under any Sanctuary permit;

- Revise and clarify permit issuance criteria;

- Further refine current requirements and procedures from general National Marine Sanctuary Program regulations (15 CFR 922.48(a) and (c)); and

- Expressly require that in addition to any other terms and conditions the Director deems appropriate, Sanctuary permits must require that the permittee agrees to hold the United States harmless against any claims arising out of the permitted activities.

Alternative 1 includes the proposed suite of new and revised regulations in the Proposed Action described above, along with regulatory language providing greater resource protection than the Proposed Action for

the prohibitions on discharging or depositing material or other matter from within or into the Sanctuary, and operation of vessels within one nmi of Island shores. The Alternative 1 regulations would:

- Specify that the exception for discharges or deposits generated by operable Type I or II marine sanitation devices does not apply to such discharges or deposits from vessels of 300 gross registered tons or more; and

- Prohibit vessels of 150 gross registered tons or more (excluding fishing and kelp harvesting vessels) from operating within 1 nmi of the Islands.

The additional proposed regulation found exclusively in Alternative 1 prohibits lightering (defined in Program-wide regulations as at-sea transfer of petroleum-based products, materials, or other matter from vessel to vessel, 15 CFR 922.3) within the Sanctuary.

6.0 SUMMARY OF THE ANTICIPATED ENVIRONMENTAL IMPACTS

Impacts to the physical and biological environment, cultural/historical resources, and human uses of the CINMS are defined and evaluated in section 4 of this FEIS. No significant adverse impacts to any of these categories would occur as a result of implementing the Proposed Action. No cumulative impacts and less than adverse socioeconomic impacts would occur as well. Implementing the Proposed Action would have long-term beneficial effects on the physical and biological environments, on cultural/historical resources, and would benefit many of the resource-dependent human uses of the Sanctuary, such as fishing, recreation, tourism, research, and education. Table ES-1 provides a summary of impacts under the Proposed Action.

Table ES-1. Summary of Impacts Under the Proposed Action (page 1 of 3)

Legend - No impact < Less than significant adverse impact > Significant adverse impact + Beneficial impact Note: Proposed regulatory changes are summarized	Physical Environment	Biological Environment	Cultural/Historical Resources	Human Use										
				Oil & Gas	Tele-communications	Minerals Mining	Vessels & Harbors	Commercial Fishing	Recreation & Tourism (consumptive and non-consumptive)	Marine Salvage Businesses	Motorized Personal Watercraft	Aviation	Research & Education	Department of Defense
Prohibition 1 (modification): Exploring for, Developing, or Producing Hydrocarbons														
Remove outdated and unnecessary oil spill contingency equipment requirements for offshore oil industry operations at leased areas partially within the Sanctuary	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Prohibition 2 (new): Exploring for, Developing, or Producing Minerals	+	+	+	-	-	<	-	+	+	-	-	-	+	-
Prohibition 3 (modifications): Discharge or Deposit														
Specify that the existing exception for discharging or depositing fish, fish parts, or chumming materials (bait) applies only to lawful fishing activity within the Sanctuary	-	+	-	-	-	-	-	-	<	-	-	-	<	-
Remove an exception for discharging or depositing meals on board vessels	-	+	-	-	-	-	<	<	<	<	-	-	<	-
Clarify that discharges allowed from marine sanitation devices apply only to Type I and Type II marine sanitation devices	+	+	-	-	-	-	<	<	<	<	-	-	<	-
Provide an exception for graywater discharge from vessels less than 300 GRT, and from oceangoing ships 300 GRT or more without the capacity to hold graywater while within the CINMS	+	+	-	-	-	-	<	+	+	-	-	-	-	-

Legend - No impact < Less than significant adverse impact > Significant adverse impact + Beneficial impact Note: Proposed regulatory changes are summarized	Physical Environment	Biological Environment	Cultural/Historical Resources	Human Use										
				Oil & Gas	Tele-communications	Minerals Mining	Vessels & Harbors	Commercial Fishing	Recreation & Tourism (consumptive and non-consumptive)	Marine Salvage Businesses	Motorized Personal Watercraft	Aviation	Research & Education	Department of Defense
Prohibit treated sewage discharge (MSD Type I or II) from cruise ships, and from oceangoing ships without the capacity to hold sewage while within the CINMS	+	+	-	-	-	-	<	+	+	-	-	-	-	-
Prohibit discharges and deposits of any material or other matter from beyond the boundary of the Sanctuary that subsequently enters the Sanctuary and injures a Sanctuary resource or quality	+	+	-	-	-	-	-	-	-	-	-	-	-	-
Prohibition 4 (modification): Altering the Seabed														
Extend from 2 nmi to 6 nmi from Islands the existing prohibition on alteration of the submerged lands of the Sanctuary	+	+	+	-	<	<	-	+	+	-	-	-	+	-
Prohibition 5 (new): Abandoning any structure, material or other matter on or in the submerged lands of the Sanctuary	+	+	+	-	-	-	<	+	+	+	-	-	+	-
Prohibition 6 (modification): Nearshore Operation of Vessels														
Prohibit vessels of 300 gross registered tons or more (excluding fishing and kelp harvesting vessels) from approaching within 1 nmi of the Islands	+	+	+	-	-	-	-	+	<	-	-	-	<	-
Prohibition 7 (modification): Disturbing a Seabird or Marine Mammal by Aircraft Overflight – minor wording changes	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Legend - No impact < Less than significant adverse impact > Significant adverse impact + Beneficial impact Note: Proposed regulatory changes are summarized	Physical Environment	Biological Environment	Cultural/Historical Resources	Human Use										
				Oil & Gas	Tele-communications	Minerals Mining	Vessels & Harbors	Commercial Fishing	Recreation & Tourism (consumptive and non-consumptive)	Marine Salvage Businesses	Motorized Personal Watercraft	Aviation	Research & Education	Department of Defense
Prohibition 8 (modification): Moving, Removing, or Injuring a Historical Resource														
Revise and strengthen to prohibit "moving, possessing, injuring or attempting to move, remove, or injure any Sanctuary historical resource"	-	-	+	-	-	-	-	-	+	-	-	-	+	-
Prohibition 9 (new): Taking a Marine Mammal, Sea Turtle, or Seabird except as authorized under the Marine Mammal Protection Act, the Endangered Species Act, or the Migratory Bird Treaty Act	-	+	-	-	-	-	-	<	+	-	-	-	+	-
Prohibition 10 (new): Possessing Marine Mammals, Sea Turtles, or Seabirds except as authorized under the Marine Mammal Protection Act, the Endangered Species Act, or the Migratory Bird Treaty Act	-	+	-	-	-	-	-	<	+	-	-	-	+	-
Prohibition 11 (new): Tampering with Sanctuary Signs and Markers	+	+	+	-	-	-	-	-	-	-	-	-	-	-
Prohibition 12 (new): Releasing an Introduced Species within or into the Sanctuary	+	+	+	-	-	-	-	+	+	-	-	-	+	-
Prohibition 13 (new): Operation of Motorized Personal Watercraft within Channel Islands National Park	+	+	-	-	-	-	-	-	-	-	-	-	-	-
Sanctuary Boundary Description Clarifications	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Exemptions and Requirements for Department of Defense Activities (modifications)	<	<	<	-	-	-	-	<	<	-	-	-	<	-
Permit Procedures and Issuance Criteria (modifications)	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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1.0 INTRODUCTION

This Final Environmental Impact Statement (FEIS) is Volume II of a two-volume set that is the result of an extensive management plan review process at the Channel Islands National Marine Sanctuary (CINMS or Sanctuary), offshore California. Volume I, the Final Management Plan (FMP), contains information about the Sanctuary's environment and resources, staffing and administration, priority management issues and actions proposed to address them over the next five years, and performance measures. Volume II, the FEIS, evaluates the potential environmental impacts of the Sanctuary's proposed actions, *i.e.*, the proposed revisions to CINMS regulations. The Sanctuary's proposed actions and several other alternative actions are described in section 2 of this FEIS. The National Oceanic and Atmospheric Administration (NOAA) is the lead agency for this proposed project.

This FEIS has been prepared in accordance with the National Environmental Policy Act of 1969, as amended (NEPA), 42 U.S.C. 4321 *et seq*., and its implementing regulations, 40 CFR parts 1500–1508. The Notices of Intent (NOI) to prepare this EIS (64 FR 31528; 72 FR 40775) are provided in Appendices A.1 and A.2 of this document.

This FEIS incorporates changes made to the Draft Environmental Impact Statement (DEIS) in response to public and agency comments received on the DEIS issued in 2006, and on the Supplemental DEIS (SDEIS) issued in 2008, and also incorporates information contained within the SDEIS.

1.1 THE NATIONAL MARINE SANCTUARY PROGRAM

Under the National Marine Sanctuaries Act, as amended, 16 U.S.C. 1431 *et seq*., (NMSA) the Secretary of Commerce (Secretary) is authorized to designate and manage areas of the marine environment as national marine sanctuaries. Such designation is based on attributes of special national significance, including conservation, recreational, ecological, historical, scientific, cultural, archaeological, educational, or aesthetic qualities. The primary objective of the NMSA is to protect Sanctuary resources.

Per the NMSA, the National Marine Sanctuary Program[3] (NMSP) strives to improve the conservation and management of marine resources and will "maintain for future generations the habitat, and ecological services, of the natural assemblage of living resources that inhabit these areas" (16 U.S.C. 1431 (a)(4)(c)). This statutory finding guides the NMSP to take a broad and comprehensive management approach consistent with the NMSA's primary objective of resource protection. The focus of such an approach is broad-scale, ecosystem-level protection and management, unique vis-à-vis the various agencies and laws directed at managing single or limited numbers of species or specific human activities within the ocean. As such, ecosystem-based management serves as the framework for the revised CINMS management plan.

To date, thirteen national marine sanctuaries and one marine national monument have been designated. These sanctuaries and monument include both nearshore and offshore areas. Their designation provides protection for sensitive marine ecosystems, such as coral reefs and kelp forests, habitat used by important marine species, and historically significant shipwrecks and artifacts. In addition, these areas serve as

[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.

valuable educational, recreational, scientific, and commerce resources. National Marine Sanctuary Program regulations are carried out under the NMSA and are codified at 15 CFR part 922. The mission of the NMSP "is to identify, designate and manage areas of the marine environment of special national, and in some cases international, significance due to their conservation, recreational, ecological, historical, research, educational, or aesthetic qualities."

The NMSP regulations include prohibitions on specific kinds of activities, descriptions of sanctuary boundaries, and a permitting system to allow certain types of activities to be conducted within sanctuaries that would otherwise be prohibited. Each of the thirteen national marine sanctuaries has its own set of site-specific regulations within subparts F through R of 15 CFR part 922. The regulations for the CINMS are found at Subpart G.

1.1.1 Channel Islands National Marine Sanctuary

Designated in 1980, the CINMS consists of an area of approximately 1,128[4] square nautical miles (nmi) off the southern coast of California. The Sanctuary boundary 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 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 combined 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, maritime shipping, and nearby offshore oil and gas development. More details about the Sanctuary environment and human setting may be found in section 3 of this EIS, and in section II of the Final Management Plan.

1.2 PROJECT LOCATION

The four northern Islands, Anacapa, Santa Cruz, Santa Rosa, and San Miguel, are in waters approximately 20 statute miles south of the Santa Barbara and Ventura County coast. Santa Barbara Island is approximately 50 statute miles southwest of the shoreline of Los Angeles and 30 statute miles west of the westernmost part of Santa Catalina Island. The CINMS is also at the northwestern end of a much larger area referred to as the Southern California Bight (SCB). The SCB is formed by a transition in the California coastline wherein the north-south trending coast begins to trend east-west. Figure 1.2-1 shows the regional location of the CINMS; the Study Area for this EIS, including the CINMS boundary and surrounding area, is shown in more detail in Figure 1.2-2.

[4] From 1980 to 2007, the area of CINMS was described as approximately 1252.5 square nautical miles. However, adjusting for technical corrections and using updated technologies, 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 marine protected area (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 from approximately 1,113 square nautical miles to approximately 1,128 square nautical miles. This approximately 15 square nautical mile increase 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. This change did not constitute a change in the geographic area of the Sanctuary (other than the approximately 15 square nautical miles referred to above) but rather an improvement in the estimate of its size.

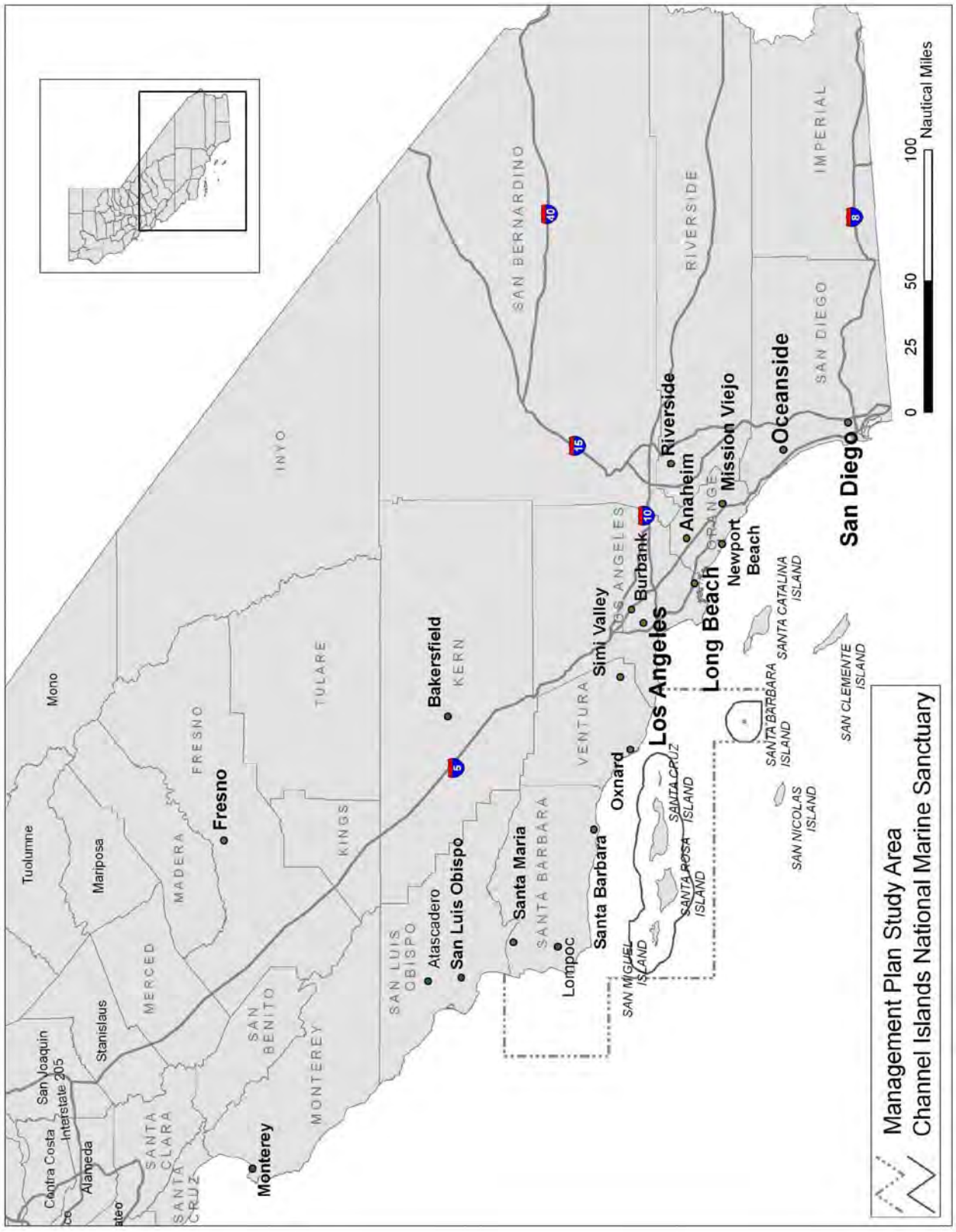

Figure 1.2-1 Regional Location of the CINMS Study Area.

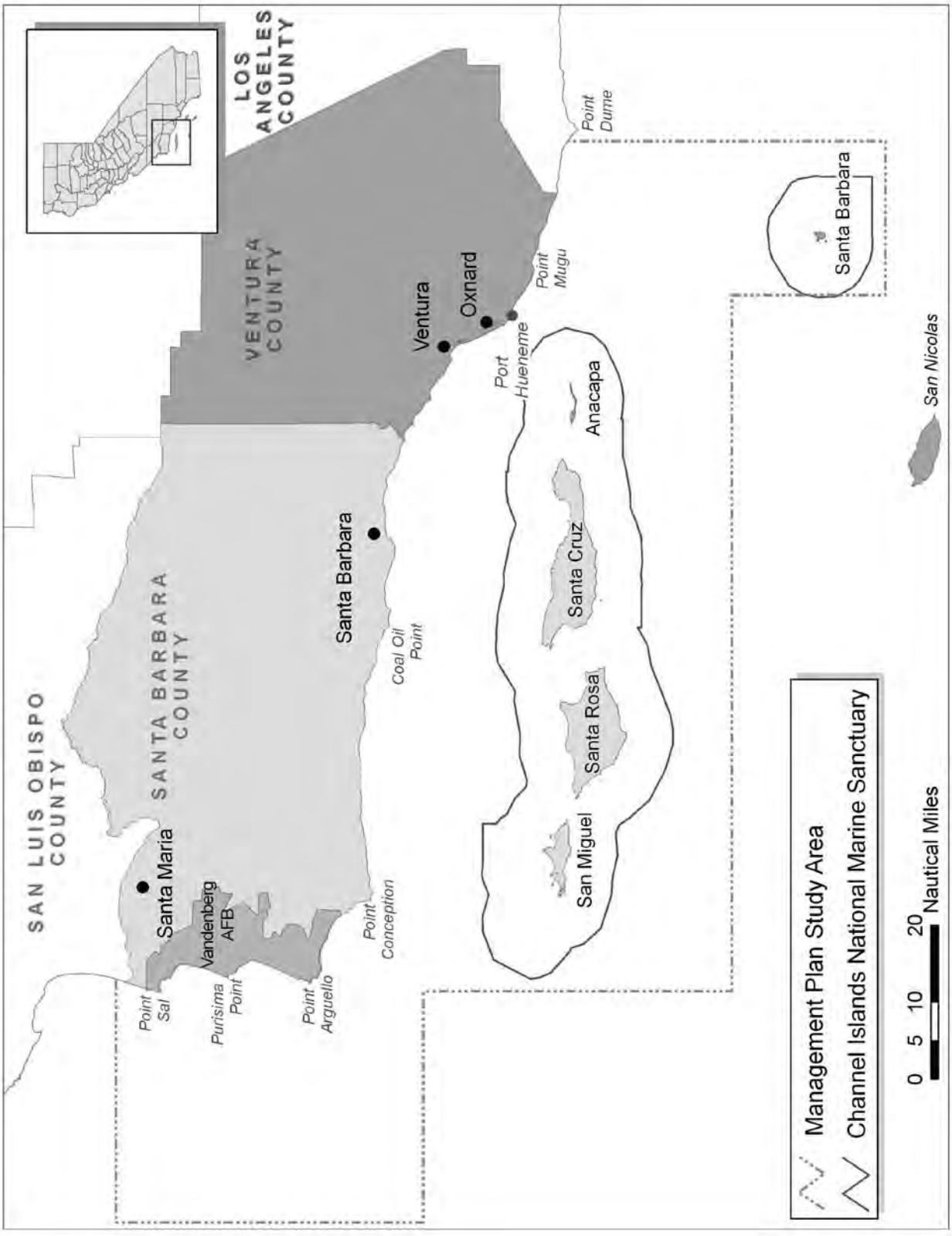

Figure 1.2-2 CINMS EIS Study Area Location Map

1.3 PURPOSE AND NEED

The Sanctuary's terms of designation and regulations were published in the Federal Register in 1980 (vol. 45, No. 193), and the original management plan was completed in 1983. No formal review or revision of the management plan or Sanctuary regulations has occurred since that time. Congress, however, has amended the NMSA numerous times, strengthening and clarifying the conservation principles for the program. The amended NMSA calls upon the NMSP to review the management plan of each sanctuary in five-year intervals and to revise the management plan and regulations as necessary to fulfill the purposes and policies of the NMSA (16 U.S.C. 1434(e)).

Sanctuaries are the subject of management plan review in order to:

- Evaluate the substantive progress toward implementing the management plan and goals, especially the effectiveness of site-specific management techniques and strategies;
- Determine revisions as may be necessary to the management plan and regulations;
- Prioritize management objectives; and
- Inform the general public and Sanctuary constituents about the Sanctuary and management strategies planned for future years.

For the CINMS, there are additional reasons for revising the original management plan. Since its designation as a national marine sanctuary, significant advances in science and technology, as well as innovations in marine resource management techniques, have rendered the original 1983 CINMS management plan and its corresponding EIS significantly outdated. Furthermore, new threats to Sanctuary resources have emerged, requiring new approaches in CINMS resource management. In addition, the original management plan did not contain performance indicators to help evaluate the effectiveness of either the CINMS or the NMSP. A new management plan is needed to reflect these changes and to guide actions that can achieve effective conservation and management of Sanctuary resources.

The CINMS management plan review began with public scoping in 1999. Following the public scoping process, Sanctuary staff, public forum groups, the CINMS SAC, and NMSP leadership contributed to the identification of nine priority resource management issue categories to be considered in the new management plan:

- Water quality;
- Public awareness and knowledge of the Sanctuary;
- Research and monitoring;
- Enforcement;
- Boundary change;
- Human uses (recreational, commercial, military);
- Marine reserves;

- Marine mammal and seabird protection; and

- Administrative issues (performance standards, improved inter-agency coordination).

Staff further refined these issue categories and focused the development of action plans and regulatory changes upon priority resource management issues. Specific regulatory changes proposed and analyzed in this FEIS address several priority resource management issues. The FMP (Vol. I) addresses many resource management issues through nine action plans: Public Awareness and Understanding, Conservation Science, Boundary Evaluation, Water Quality, Emergency Response and Enforcement, Maritime Heritage, Resource Protection, Operations, and Performance Evaluation.

This document has been prepared, in part, because NEPA requires federal agencies to prepare an appropriate environmental analysis - either an Environmental Impact Statement (EIS) or Environmental Assessment (EA) - to thoroughly assess the environmental impacts of major federal actions that could significantly affect the human environment.

In addition, this FEIS has been prepared because revisions and updates to the outdated portions of the 1980 CINMS terms of designation are proposed. The terms of designation provide the terms of a sanctuary's designation, *i.e.*: the geographic area to be designated a national marine sanctuary, the characteristics that give the area particular value, and the types of activities that will be subject to sanctuary regulation to protect those characteristics. Proposed updates and other revisions to the CINMS terms of designation include replacing the term "seabed" with "submerged lands of the Sanctuary" to be consistent with the NMSA, clarifying that the Mean High Water Line marks the Sanctuary's shoreline boundary, and modifying the Sanctuary's scope of regulation to enable the Sanctuary to address current priority issues via Sanctuary regulations. To meet the requirements of the NMSA, which states in section 304(a)(4) that "the terms of designation may be modified only by the same procedures by which the original designation is made," the NMSP is preparing an EIS (one of the requirements of a designation).

The proposed CINMS regulatory changes have been specifically developed to improve "on the ground" Sanctuary management of priority resource management issues. Furthermore, both the proposed changes presented in this FEIS, as well as those in the FMP (Vol. I), are needed to meet the purposes and policies of the NMSA (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;

(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.

1.4 SCOPE OF THIS FEIS

This FEIS evaluates the environmental impacts associated with the proposed revised regulatory action and alternatives to the proposed action. The Proposed Action in this FEIS consists of revising existing Sanctuary regulations and adopting several new regulations. An alternative to the Proposed Action consists of a regulatory package with slight variations in the proposed regulations. Regulatory changes contained within the preferred alternative (*i.e.* the Proposed Action) and Alternative 1 are outlined below, described in detail in section 2 of this EIS, and analyzed in terms of impacts in section 4 of this EIS. In addition, a No-Action Alternative (*i.e.*, no changes to regulations) is also analyzed in this EIS.

Revisions of existing Sanctuary regulations included in the Proposed Action would:

- Clarify that Sanctuary boundaries encompass the submerged lands and that the Mean High Water Line marks the Sanctuary's shoreline boundary;
- Remove outdated and unnecessary oil spill contingency equipment requirements;
- Clarify that discharges/deposits allowed from marine sanitation devices apply only to Type I and Type II marine sanitation devices
- Provide that the discharges/deposits allowed from Type I and Type II marine sanitation devices are only allowed from vessels less than 300 gross registered tons (GRT), and from oceangoing ships without sufficient holding tank capacity to hold sewage while within the Sanctuary;
- Provide an exception for graywater discharge/deposit from vessels less than 300 GRT, and from oceangoing ships without sufficient holding tank capacity to hold graywater while within the Sanctuary;
- Define "cruise ship," "oceangoing ship" and "graywater";
- Provide an exemption for discharges by vessels of the Armed Forces allowed under section 312(n) of the Federal Water Pollution Control Act;
- Specify that the existing exception for discharging or depositing fish, fish parts, or chumming materials (bait) applies only to such discharges or deposits during the conduct of lawful fishing activity within the Sanctuary;

- Remove an exception for discharging or depositing meals on board vessels;
- Prohibit discharges or deposits of any material or other matter from beyond the boundary of the Sanctuary that subsequently enter the Sanctuary and injure a Sanctuary resource or quality;
- Extend from 2 nmi to the outer 6 nmi Sanctuary boundary the existing prohibition on alteration of the submerged lands of the Sanctuary;
- Prohibit vessels of 300 gross registered tons or more (excluding fishing and kelp harvesting vessels) from approaching within 1 nmi of the Islands;
- Revise and strengthen the existing protection of cultural/historical resources to prohibit moving, possessing, injuring, or attempting to move, remove, injure or possess any Sanctuary cultural/historical resource;
- Clarify, update and refine the regulation of Department of Defense activities occurring within the Sanctuary to, among other things, provide more consistency with the NMSA as currently written; and
- Conform wording, where appropriate, to wording used for more recently designated sanctuaries.

New regulations included in the Proposed Action would prohibit:

- Exploring for, developing, or producing minerals within the Sanctuary, except producing by-products incidental to authorized hydrocarbon production;
- Abandoning any structure, material, or other matter on or in the submerged lands of the Sanctuary;
- Taking any marine mammal, sea turtle, or seabird within or above the Sanctuary, except as authorized by the Marine Mammal Protection Act, as amended, (MMPA), 16 U.S.C. 1361 *et seq*., Endangered Species Act, as amended, (ESA), 16 U.S.C. 1531 *et seq*., Migratory Bird Treaty Act, as amended, (MBTA), 16 U.S.C. 703 *et seq*., or any regulation, as amended, promulgated under the MMPA, ESA, or MTBA;
- Possessing within the Sanctuary (regardless of where taken from, moved, or removed from) any marine mammal, sea turtle, or seabird, except as authorized by the MMPA, ESA, MBTA, or any regulation, as amended, promulgated under the MMPA, ESA, or MBTA;
- Marking, defacing, damaging, moving, removing, or tampering with any sign, notice or placard, whether temporary or permanent, or any monument, stake, post, or other boundary marker related to the Sanctuary;
- Introducing or otherwise releasing from within or into the Sanctuary an introduced species; and
- Operating a motorized personal watercraft within waters of the Channel Islands National Park, established by 16 U.S.C. 410(ff).

In addition, the Proposed Action includes revised and clarified Sanctuary permit regulations that would:

- Add specificity to and slightly expand on the types of activities for which the Director of the NMSP may issue permits;
- Specify which otherwise prohibited activities would not be allowed under any Sanctuary permit;
- Revise and clarify permit issuance criteria;
- Further refine current requirements and procedures from general NMSP regulations (15 CFR 922.48(a) and (c)); and
- Expressly require that in addition to any other terms and conditions the Director deems appropriate, Sanctuary permits must require that the permittee agrees to hold the United States harmless against any claims arising out of the permitted activities.

Alternative 1 includes the proposed suite of new and revised regulations in the Proposed Action described above, along with regulatory language providing greater resource protection than the Proposed Action for the prohibitions on discharging or depositing material or other matter from within or into the Sanctuary, and operation of vessels within one nmi of Island shores. The Alternative 1 regulations would:

- Specify that the exception for discharges or deposits generated by operable Type I or II marine sanitation devices does not apply to such discharges or deposits from vessels of 300 gross registered tons or more; and
- Prohibit vessels of 150 gross registered tons or more (excluding fishing and kelp harvesting vessels) from operating within 1 nmi of the Islands.

The additional proposed regulation found exclusively in Alternative 1 prohibits lightering (defined in Program-wide regulations as at-sea transfer of petroleum-based products, materials, or other matter from vessel to vessel, 15 CFR 922.3) within the Sanctuary.

Finally, this FEIS presents proposed changes to the Sanctuary's terms of designation (see section 2.1.17). The CINMS terms of designation were originally set in 1980 upon establishment of the Sanctuary, and per the NMSA describe the geographic area proposed to be included within the Sanctuary, the characteristics of the area that give it conservation, recreational, ecological, historical, research, educational, or esthetic value, and the types of activities that will be subject to regulation by the Secretary to protect those characteristics (16 U.S.C. 304(a)(4)). In order to implement many of the regulatory changes included in the Proposed Action, the NMSP would need to modify the Sanctuary's terms of designation describing types of activities subject to Sanctuary regulation. Additional proposed changes to the terms of designation include: an updated and more accurate description of the Sanctuary area and characteristics of the area that give it particular value, greater clarity on the applicability of Sanctuary emergency regulations, and an updated explanation of the effect of Sanctuary authority on preexisting leases, permits licenses and rights. While at least most of the proposed regulatory changes presented in this FEIS do not meet the NEPA environmental impact statement test of constituting a major federal action significantly affecting the human environment, such as wording clarifications to existing regulations, these proposed regulatory changes are nonetheless presented and assessed within this FEIS because they relate to associated proposed changes to the Sanctuary's terms of designation. Under the NMSA (16 U.S.C. 1434(a)(4), alterations to the terms of designation require the Sanctuary to go through the same procedures as site designation, including preparation of an EIS.

This FEIS analyzes regulatory changes, not the action plans proposed in the FMP (Vol. 1). The FMP action plans describe non-regulatory management strategies and actions that Sanctuary staff would use to address various issues identified during the management plan review process. Nested within each action plan is a series of strategies, each of which contains detailed actions Sanctuary staff would take over the next five years in order to meet CINMS goals and objectives. These strategies comprise activities ranging from program planning, budgeting, administrative services, mapping, vessel and aircraft operations, to basic and applied research and monitoring activities, education and outreach services, and advisory body activities. The NMSP has determined that the proposed actions within the FMP (Vol. I) individually and cumulatively are administrative in nature and have no potential for significant impact on the environment. Thus, the FMP's planned activities are not analyzed within this FEIS.

1.5 REVISIONS TO THE DEIS

This FEIS incorporates changes to the DEIS based on comments received during the DEIS public comment period, based on changes analyzed in the SDEIS and comments received during the SDEIS public comment period, and based on the NMSP's subsequent review. Between May and July of 2006, NOAA received public comment and held two hearings on the DEIS and proposed rule. Between March and May 2008, NOAA received public comment on the SDEIS and proposed rule. NOAA received over 700 comments on the DEIS, SDEIS, and proposed rule. Some public and agency comments warranted corrections, revisions, or clarifications of the DEIS text, which NOAA made. NOAA also made a small number of technical and grammatical edits to the document as well as updates to certain sections of the ecological and socioeconomic analyses. A list of regulation changes to the DEIS' proposed action is provided below, followed by descriptions of several complex changes to the discharge regulation and Sanctuary boundary, and information about other changes to the DEIS. FEIS section 2.1 explains each regulatory change included in the revised proposed action.

Changes to the Proposed Action

The following list reflects changes made to the proposed Sanctuary regulations after the release and review of the DEIS and SDEIS. These changes are reflected in sections 2.0 (Description of the Proposed Action and Alternatives) and 4.0 (Environmental Consequences of Alternatives) of this FEIS.

- Discharge and deposit regulation: modified graywater exception to apply only to vessels less than 300 gross registered tons (GRT), and oceangoing ships (300 GRT or more) without sufficient holding tank capacity to hold graywater while within the Sanctuary;

- Discharge and deposit regulation: modified treated sewage exception to apply to vessels less than 300 GRT, as well as to oceangoing ships without sufficient holding tank capacity to hold sewage while within the Sanctuary;

- Added defined terms for "cruise ship," "oceangoing ship" and "graywater"; and

- Removed the proposed outer boundary coordinate corrections, and removed the proposed corrections to the legal description of the Sanctuary area based on recalculations of the Sanctuary's size.

Incorporation of Supplemental DEIS

During the DMP/DEIS public review period (May 15 through July 21, 2006), NOAA received a wide range of comments, including substantial public and agency comments about changes proposed for Sanctuary regulation of sewage and graywater discharges from large vessels. (Herein "large vessel"

refers to a vessel 300 GRT or more, regardless of vessel type). Comments included a request that NOAA adopt the discharge regulation under DEIS alternative 1, which would prohibit any sewage discharges from large vessels, whether treated or untreated. Comments also included a request that NOAA prohibit cruise ship discharges in Sanctuary waters. In addition, there were suggestions that NOAA implement recommendations contained in the Sanctuary Advisory Council's water quality needs assessment (Polgar *et al*. 2005), which includes a recommendation that NOAA prohibit cruise ship discharges in Sanctuary waters. Comments also indicated that NOAA's original proposed exception for graywater discharges was inconsistent with the California Clean Coast Act (described in FEIS sections 3.5.3.4, and 5.2). In May 2006, NOAA submitted its Coastal Zone Management Act consistency determination to the California Coastal Commission (Commission), in compliance with federal consistency regulations (15 CFR part 930). In July 2006, the Commission conditionally concurred with NOAA's determination that the revised Sanctuary management plan and proposed regulations are consistent to the maximum extent practicable with the enforceable policies of the California Coastal Management Program. The Commission voted to concur with the consistency determination on the condition that NOAA revise the proposed discharge and deposit regulation to prohibit vessels of 300 gross registered tons or more from discharging sewage or graywater into the waters of the Sanctuary. On May 11, 2007, NOAA received a request from the California State Water Resources Control Board to prohibit discharges from certain vessels in national marine sanctuaries off the shore of California.

After reviewing the comments received, considering the Commission's action, and further analyzing the vessel discharge issues raised, NOAA decided to revise its proposed action to better address potential impacts of sewage and graywater discharges from large vessels. Thus, the SDEIS presented a revised proposed action and analyzed its potential environmental consequences of a revised discharge/deposit regulation. NOAA has incorporated into this FEIS "revised proposed action" the revisions to the discharge/deposit regulation analyzed in the SDEIS. In addition, based on comments received on the SDEIS indicating that some oceangoing ships have very limited capacity to store treated sewage, NOAA has decided to further modify the prohibition on discharging or depositing sewage from within or into the Sanctuary. The revised regulation would now provide that the exception for treated sewage is applicable to small vessels (less than 300 GRT), as well as to oceangoing ships (proposed to be defined in the CINMS regulations as private, commercial, government, or military vessels of 300 gross registered tons or more, not including cruise ships) without sufficient holding tank capacity to hold sewage while within the Sanctuary. As per the analysis in the SDEIS, the revised discharge/deposit regulation would also amend the exception to the prohibition on discharging or depositing graywater from within or into the Sanctuary. The revised regulation would provide that the exception for graywater is only applicable to small vessels (less than 300 GRT), and to oceangoing ships without sufficient holding tank capacity to hold graywater while within the Sanctuary. This revised proposed action would make the Sanctuary regulations in state waters (0 to 3 nmi) consistent with the standards of the California Clean Coast Act, and apply those same regulatory standards in federal waters of the Sanctuary (3 nmi to outer Sanctuary boundary).

Information from the Supplemental DEIS is incorporated into the FEIS in section 2.0 (Description of the Proposed Action and Alternatives), section 3.0 (Affected Environment) and section 4.0 (Environmental Consequences of Alternatives). In summary, the revised discharge/deposit regulation does not change the impact findings of the DEIS; the discharge/deposit regulation would result in beneficial impacts for the Sanctuary's biological and physical resources, and in less than significant adverse impacts on some Sanctuary users.

Sanctuary Boundary Description

In 2007, NOAA issued an FEIS and final rule analyzing and establishing a network of marine reserves and conservation areas within federal waters of the Sanctuary. Within these documents NOAA also made technical corrections to the CINMS boundary coordinates, re-calculated the original CINMS area as approximately 1,113 square nautical miles (72 FR 29208), and increased the Sanctuary area by approximately 15 square nautical miles to allow the boundary of four marine reserves to be defined by straight lines projecting outside the original CINMS boundary, allowing for better enforcement of the marine reserves. This change did not constitute a change in the geographic area of the Sanctuary (other than the approximately 15 square nautical miles referred to above) but rather an improvement in the estimate of its size. NOAA originally intended to make technical corrections to the Sanctuary boundary coordinates and re-calculate the CINMS area (provided at 15 CFR 922.70) as part of the CINMS management plan review EIS and rule. However, since NOAA made the technical corrections and re-calculated the CINMS area in 2007 as part of the FEIS and final rule to establish marine reserves and conservation areas within the Sanctuary, these aspects of clarifying the Sanctuary boundary description are not included in this FEIS.

Other Revisions to DEIS

In addition to the above revisions, clarifications and updates were provided to several sections of the EIS, including the following:

- Updated section 5 to include the California Clean Coast Act that took effect in 2006;
- Updated and improved maps and figures;
- Updated section 3 to reflect recent data and management actions regarding the southern sea otter;
- Refined and augmented section 3 information on both Chumash history and contemporary Chumash culture;
- Updated and refined section 3 information on offshore oil development and production;
- Removed appendices that provided the National Marine Sanctuaries Act[5] and the rule (NOAA will publish the final rule no sooner than 30 days after publication of the FEIS); and
- Updated section 3 information on vessel strikes with wildlife to reflect blue whale ship strike mortalities in 2007.

1.6 ISSUES BEYOND THE SCOPE OF THIS FEIS

The proposed action and alternatives analyzed in this FEIS do not include consideration of Sanctuary boundary expansion or the designation of marine reserves (no-take areas) or marine conservation areas (limited-take zones) within the Sanctuary. These considerations are explained briefly below.

[5] The National Marine Sanctuaries Act may be found online at: http://sanctuaries.noaa.gov/about/legislation/welcome.html.

1.6.1 Boundary Expansion

During the 1999 public scoping meetings, and subsequently over the next two years, the most frequently raised public topic was CINMS boundary expansion. Although CINMS staff received less than a hundred comments that expressed opposition to the idea of expanding the Sanctuary boundary, they received hundreds of e-mails and letters (including three petitions with over 1,500 signatures) in support of enlarging the Sanctuary. Many of these letters encouraged the Sanctuary to improve its ecosystem representation by expanding the Sanctuary boundary to the mainland coast. Other reasons for expanding the boundary were to address watershed runoff, oil and gas development, water quality threats, military activity impacts, and to provide better overall marine resource protection.

From 1999 through 2001, based on input received during the public scoping process and over the course of several SAC meetings and workshops, Sanctuary staff and the SAC developed a preliminary range of boundary concepts to be considered as possible redefined outer boundaries for the CINMS. These ideas included the status quo boundary option plus five new preliminary boundary configurations. Maps and descriptions of these boundary configurations are presented in Appendix D of the FMP (Vol. I).

In 2002 NOAA determined that additional scientific data collection and analysis would be desirable in order to evaluate the effectiveness of each boundary configuration in meeting NMSP goals. In response, NOAA's National Centers for Coastal Ocean Science (NCCOS) conducted a biogeographic assessment from 2003 to 2005.

This FEIS analyzes the proposed regulatory alternatives solely within the existing Sanctuary boundary. However, the Boundary Evaluation Action Plan within the FMP (Vol. I) calls for the initiation of a supplemental comprehensive, scientifically-based, open public environmental review process that will lead to a sound future decision on the Sanctuary's boundary and the application of Sanctuary regulations within that selected boundary. The NMSP will incorporate results of the NCCOS biogeography assessment into the supplemental environmental review process. Regulations for areas of any proposed boundary expansion may or may not be identical to those proposed for the existing Sanctuary boundary; the regulations applicable to each boundary concept will be evaluated in the supplemental EIS. Reaching a final decision on this issue would involve a NEPA-compliant supplemental environmental impact analysis process, resulting in a supplemental EIS and supplemental management plan. That future process, outlined below in Figure 1.6-1, will provide several additional opportunities for public comment. At this time, the preliminary boundary concepts previously developed with community input are available for public comment and provided in Appendix D of the FMP (Vol. I).

1.6.2 Marine Reserves and Conservation Areas

To address a number of concerns related to the need to increase protection of the Sanctuary's natural resources, scoping comments recommended the use of marine reserves (no-take areas) as an ecosystem management tool. In 1999, the marine reserves working group (MRWG) of the SAC began the process of considering marine reserves as a tool for use within the Sanctuary, along with monitoring, research, education, and enforcement strategies. In 2001, the SAC presented its recommendations to CINMS staff and the California Department of Fish and Game (CDFG). On October 23, 2002, the California Fish and Game Commission adopted a network of ten marine reserves and two marine conservation areas (all referred to as marine protected areas) in portions of the state waters within CINMS. In 2007, NOAA completed a separate NEPA analysis and rulemaking process (72 FR 29208) to complete the Channel Islands marine protected area (MPA) network by augmenting the marine protected areas established by the state. As such the consideration of marine reserve zoning is outside the scope of this EIS.

Since 2003, Sanctuary staff have since been cooperating with several state and federal agencies to manage the Channel Islands Marine Protected Area Network. Additional details of Sanctuary efforts to support enforcement, monitoring, and education pertaining to the Channel Islands state marine protected areas are provided in the FMP's Action Plans (Vol. I).

1.7 NEPA PUBLIC COMMENT PROCESS

Public comment is an important part of the scoping process for an EIS, and an important part of the broader management plan review process (described in more detail in the introduction to Vol. I). Associated with public scoping are procedures aimed at facilitating review and input from interested and affected parties. Soliciting public comment begins when the notice of intent (NOI) is published in the *Federal Register* (Appendix A.1) and continues through the preparation of the EIS.

1.7.1 Council on Environmental Quality Regulations

According to Council on Environmental Quality (CEQ) regulations, federal agencies are required to "make diligent efforts to involve the public in preparing and implementing their NEPA procedures" (40 CFR 1506.6(a)). One aspect of public involvement is the public comment process. Public involvement begins with public notice of scoping meetings, followed by the public release of the Draft EIS to persons and agencies potentially interested in or affected by the proposed project and to those that have requested a copy, and any NEPA-related public hearings or meetings (40 CFR 1506.6(b)).

1.7.2 Scoping Process

By providing a means of open communication between NOAA and the public, the procedural aspects of NEPA promote better decision-making. Those having a potential interest in the proposed project, including minority, low-income, disadvantaged, and other interested groups, were notified and invited to participate in the scoping and environmental impact analysis process. The scope of this EIS was determined through public scoping, input from public agencies and officials, experience from and research for similar projects, and NEPA requirements. Per CEQ regulations, this process begins early in the EIS development and is open for input from interested parties (40 CFR 1501.7). CEQ regulations guide public participation opportunities.

As part of the scoping process, the lead agency is required to do the following:

- Invite the participation of affected federal, state, and local agencies, any affected Native American tribes, the proponent of the action, and other interested persons;
- Determine the scope and significant issues to be analyzed in depth in the EIS;
- Identify and eliminate from detailed study the issues that are not significant or that have been covered by prior environmental review;
- Indicate any public Environmental Assessments (EAs) and other EISs that are being or will be prepared that are related to but are not part of the scope of the EIS under consideration;
- Identify other environmental review and consultation requirements so the lead and cooperating agencies may prepare other required analyses and studies together with the EIS; and
- Indicate the relationship between the timing of the preparation of environmental analyses and the agency's tentative planning and decision-making schedule.

The scoping process for this EIS was initiated when NOAA published an NOI in the *Federal Register* on June 11, 1999 (Appendix A.1). As discussed above, in 1998 CINMS formed a SAC as a forum through which Sanctuary constituents can provide advice to the Sanctuary Manager, including advice on the management plan review and the EIS. From July to September 1999, seven public scoping meetings were held across San Luis Obispo, Santa Barbara, Ventura, and Los Angeles counties, as well as in Washington, D.C., followed by a public presentation of the findings in October 1999. CINMS staff received over 1,900 comments. In addition, approximately 30 public and agency meetings have been held to date and consultation letters have been mailed out to key federal, state, and local agencies and officials soliciting their input on the proposed management plan update. Documentation of the scoping process is included in Appendix A.3. The major concerns and issues expressed during the scoping process are described above in section 1.3.

1.7.3 Public Review of the DEIS

The initial scoping process allowed the public to have input on issues analyzed in this document. In addition, subsequent meetings of the SAC in 2000–2003, including special workshops on selected management plan issues (*e.g.*, boundaries, military activities, regulations), provided numerous opportunities for the public to learn about the status of plan development and offer additional input. Over the summer of 2004 all individuals and agencies on the Sanctuary mailing list received a postcard notifying them of the pending public release of the draft environmental impact statement (DEIS) and draft management plan (DMP), and soliciting their response as to whether they would like to be on the management plan review mailing list and indicate their preferred document format. In 2006, NOAA solicited public comment on the DEIS during a 64-day public review period. Public hearings were held no sooner than 30 days after the Notice of Availability was published in the Federal Register and at least 15 days before the end of the comment period. In March 2008, NOAA solicited comments on the SDEIS during a 63-day public review period. Availability of the DEIS and the SDEIS were announced in the Federal Register, on various e-mail lists, on the project Web site, and in local newspapers. In addition, copies of the DEIS and SDEIS were available for review in numerous locations, such as libraries, throughout the study area. During the public comment periods, oral and written comments were received from federal, state, and local agencies and officials, organizations, and interested individuals.

NOAA's CINMS management plan review mailing list of persons and agencies potentially interested in or affected by the proposed project and who requested a copy of the management plan/EIS is provided in Appendix E of this FEIS. The development and review process for the revised CINMS management plan and EIS is illustrated in Figure 1.6-1.

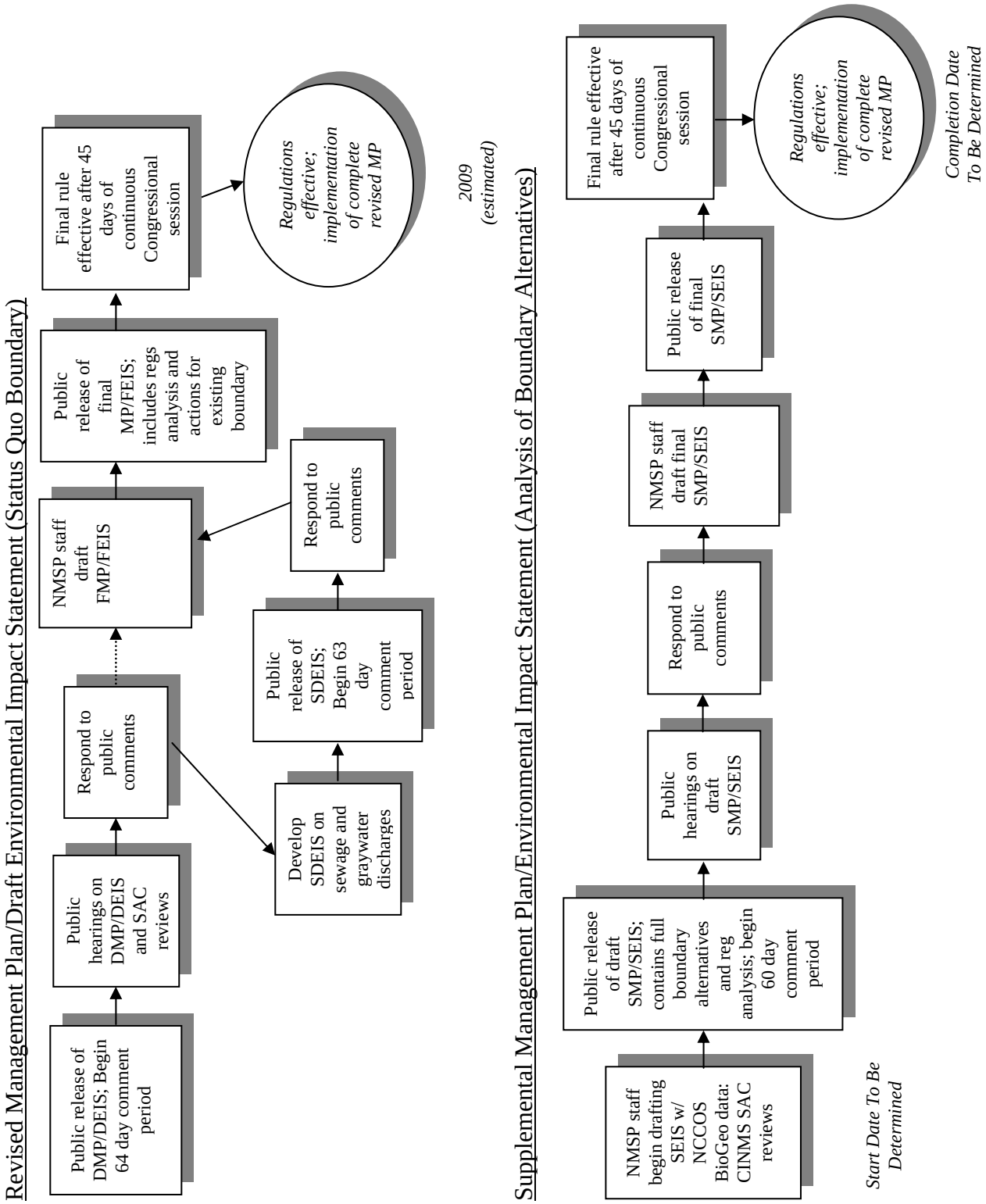

Figure 1.6-1 Development and Review Process for the Revised CINMS Management Plan and Environmental Impact Statement

1.7.4 Public Comment Management Process

After the public comment periods on the DMP/DEIS and SDEIS, NOAA reviewed, discussed, and summarized all comments received on the two documents. Responses to substantive comments were prepared and revisions were made, as deemed necessary. A summary of comments received on the DEIS/DMP and SDEIS, and corresponding responses, is included in this FEIS in Appendix B.

After issuance of this FEIS, NOAA is required to wait 30 days before issuing its Record of Decision (ROD) and final rule. The final rule will take effect after 45 days of continuous Congressional session.

1.8 INTERAGENCY COORDINATION

NOAA has sought the input of a number of federal, state, and local officials and agencies in preparing this FEIS. The list of these officials and agencies is provided in section 7.0.

1.9 EXAMPLES OF RELATED STUDIES AND PROCESSES

Other studies and processes have been recently completed or are being conducted by federal agencies that are pertinent to marine resources in the Channel Islands region. These include:

- *Final Environmental Impact Statement/Over Seas Environmental Impact Statement, Point Mugu Sea Range* (U.S. Navy 2002);
- *California Department of Fish and Game's Final Environmental Impact Report on the Marine Protected Areas in the National Oceanic and Atmospheric Administration's Channel Islands National Marine Sanctuary* (Ugoretz 2002);
- *CINMS Final Environmental Impact Statement for the Establishment of Marine Reserves and Marine Conservation Areas* (2007);
- *Pacific Coast Groundfish Fishery Management Plan and Essential Fish Habitat Designation and Minimization of Adverse Impact* (NMFS 2006);
- Development of a new General Management Plan for the Channel Islands National Park (CINP) by the NPS*;*
- Environmental assessments of granting suspensions of production or operations for nine units and one non-utilized lease in the Pacific Outer Continental Shelf (MMS 2005);
- Implementation of the Energy Policy Act of 2005;
- Implementation of the California Clean Coast Act of 2006;
- Port of Long Beach expansion proposed in the *Port of Long Beach Master Plan* (2003);
- Consideration of potential CINMS boundary expansion;
- The Joint Management Plan Review of the Monterey Bay, Cordell Bank, and Gulf of the Farallones national marine sanctuaries; and

- Crystal Energy proposal for a liquefied natural gas terminal offshore from Santa Barbara County.

More information about each of the above studies and processes is included in section 4.6 of this document, which addresses the cumulative impacts of the Sanctuary's proposed action.

1.10 ORGANIZATION OF THE EIS

This section (1.0) provides a background discussion of the NMSP and the proposed project at the CINMS. In addition, this section discusses the EIS public scoping process and lists the identified issues of concern.

Section 2.0 (Description of the Proposed Action and Alternatives) describes the Proposed Action, which consists of adopting revisions to existing Sanctuary regulations plus several proposed new regulations. This section also includes a description of alternatives to the Proposed Action, which include the No-Action Alternative.

Section 3.0 (Affected Environment) describes the project background and the existing conditions in the surrounding area to provide a baseline for assessing environmental impacts that may occur. Regional and site-specific information is provided related to the physical environment, biological environment, historical resources, and human uses (including oil and gas activities, vessel traffic and harbor activities, contaminant sources, Department of Defense and related activities, fishing, introduced species, recreation and tourism, and research and education).

Section 4.0 (Environmental Consequences of Alternatives) includes an evaluation of potential impacts to the physical and biological environment, historical resources, and human uses, including socioeconomic impacts that may occur as a result of implementing the Proposed Action and Alternatives. Direct, indirect, short-term, and long-term impacts are evaluated. This section also provides a discussion of cumulative impacts, any irreversible and irretrievable commitment of resources, the relationship between short-term uses of resources and the maintenance and enhancement of long-term productivity, unavoidable impacts, environmental justice, and growth-inducing impacts. Finally, potential mitigation measures for significant environmental impacts are discussed, if applicable.

Section 5.0 presents a list of other applicable federal and state law and regulations.

Sections 6.0 through 11.0 contain References, Persons and Agencies Contacted, a List of Preparers, Acronyms and Abbreviations, and a Glossary of Terms, respectively.

Appendices to support the analyses in the EIS consist of the following:

- Appendix A—Notices of Intent and Documentation of Public Scoping Process;
- Appendix B— Public Comments and Responses;
- Appendix C—Biological and Historical/Cultural Resources of the Study Area;
- Appendix D—Proposed Determinations and Findings; and
- Appendix E—EIS Mailing List.

2.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

Introduction

This section describes various proposed regulatory changes under consideration as part of the CINMS Management Plan Review. In evaluating alternatives for analysis in the EIS, NOAA considered proposed regulatory changes appropriate for and consistent with achieving increased protection of the ecosystem, improving scientific knowledge of the area, and promoting public understanding of the value of the CINMS resources and qualities. This section includes a description of the screening criteria used to develop alternatives considered for the EIS evaluation process, as well as descriptions of the Proposed Action, Alternative 1, No-Action Alternative, and alternatives considered but dismissed from further evaluation.

This section incorporates some regulation wording revisions to the Proposed Action, and associated updated information, that resulted from comments received on the proposed rule and DEIS. This section also incorporates into the Proposed Action the revised proposed discharge/deposit regulation as addressed in the Supplemental DEIS, which was issued in March 2008.

Alternatives considered in this EIS include:

- Proposed Action: an alternative that contains updates or other changes (including additions) to the regulations that further CINMS management objectives;

- Alternative 1: an alternative that contains regulatory language providing greater resource protection than the Proposed Action, including one new regulation on lightering; and

- No-Action Alternative: an alternative that includes the status quo regulatory scenario, along with a discussion of possible means by which the Sanctuary may augment its planned non-regulatory actions in lieu of the proposed regulatory changes.

It should be noted that the strategies and actions described in Volume I, Final Management Plan (FMP), are non-regulatory in nature and not analyzed in this EIS. The FMP's Action Plans comprise activities ranging from program planning, budgeting, administrative services, mapping, vessel and aircraft operations, to basic and applied research and monitoring activities, education and outreach services, and advisory body activities. NOAA has determined that the proposed actions within the FMP individually and cumulatively are administrative in nature and have no potential for significant impact on the environment and, therefore, are not analyzed within this EIS.

With the proposed regulatory changes, CINMS regulations would continue to prohibit a relatively narrow range of activities, set forth procedures and criteria for national marine sanctuary permits to conduct otherwise prohibited activities and set forth procedures for administrative appeal, and establish Department of Defense activities that would be exempt from the regulations. More specifically, the choice of either the Proposed Action or Alternative 1 would amend the CINMS-specific regulations contained in the NMSA (15 CFR part, 922 Subpart G). A number of the regulatory amendments included in these two alternatives may not be implemented without broadening the CINMS scope of authority. Thus, this section also describes changes to the CINMS terms of designation necessary for implementing the Proposed Action (as well as Alternative 1).

Screening Criteria

As part of the planning process for developing reasonable alternatives for revising the CINMS regulations, several screening criteria were considered. The criteria for reasonable alternatives included the following:

- Alternatives must satisfy the overarching goals of the NMSA, in essence, meaning they must address resource management issues, generate beneficial environmental effects, and address uses or other activities that have a negative effect (including risk) on CINMS resources;
- Alternatives should meet the goals and objectives of the designation of the CINMS;
- Alternatives should allow for the incorporation and consideration of recent and/or best available data and scientific knowledge;
- Alternatives should maximize environmental benefits while avoiding unnecessary negative socioeconomic impacts;
- Alternatives should remove obsolete requirements and increase the clarity of existing Sanctuary regulations;
- All alternatives should be feasible for the Sanctuary; and
- Alternatives should, where appropriate, provide for increased consistency with other national marine sanctuaries' regulations.

This FEIS has been prepared in accordance with NEPA and the CEQ implementing regulations. The FEIS presents, to the decision maker and the public, information required to understand the potential environmental consequences (discussed in section 4.0 of this FEIS) of the Proposed Action and other alternatives.

Summary Table 2.1-1, located at the end of section 2, compares regulatory wording changes provided in the Proposed Action and Alternative 1 with wording of the current regulations (status quo). In addition, the Proposed Action's exact regulatory language is contained in the proposed rule. The following discussion provides a qualitative description and overview of the changes proposed under each alternative.

2.1 PROPOSED ACTION

The following text describes the Proposed Action, which includes the suite of regulatory changes designed to satisfy the above criteria.

2.1.1 CINMS Boundary Description Clarification

Clarifications are proposed for the description of the CINMS boundary (codified at 15 CFR 922.70) to provide a more accurate and clear explanation of the existing Sanctuary boundary. One clarification would specify that the submerged lands (*i.e.*, the lands underlying the waters of the Sanctuary) are part of the CINMS boundary. The NMSP has consistently treated submerged lands as part of national marine sanctuaries, and this is reflected in amendments to the NMSA passed in 1984 (16 U.S.C. 1432(3)). The Sanctuary's description of the shoreline boundary demarcation is also proposed for clarification.

Specifically, the boundary description is proposed to be amended to clarify that the shoreline boundary is the Mean High Water Line (MHWL) of Island shores.

The proposed revised boundary description is presented below, showing added text (underlined) and deleted text (strike-through):

> The Channel Islands National Marine Sanctuary (Sanctuary) consists of an area of ~~the water off the coast of California of~~ approximately 1,128 square nautical miles (nmi) of coastal and ocean waters, and the submerged lands there under, 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 ~~adjacent to~~ 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 (~~collectively~~ the Islands) ~~extending seaward to a distance of approximately six nmi~~. The seaward boundary coordinates are listed in the Appendix ~~A~~ to this subpart.

2.1.2 Prohibition 1 (Oil and Gas)

One substantive change would be made to the existing (1982) oil and gas regulation in order to remove outdated cleanup requirements. The oil spill contingency equipment technology required in the 1982 regulation would be eliminated, since this technology has become obsolete. The terms of the current lease agreements between MMS and the lessees prescribe a mandatory oil spill contingency plan for both exploration and development that is more stringent than the Sanctuary's previous (1982) requirements. The revised regulation would continue to prohibit the exploration for, development of, or production of hydrocarbons within the Sanctuary, except pursuant to leases executed prior to March 30, 1981, and except for the laying of pipeline pursuant to exploring for, developing, or producing hydrocarbons.

The proposed revised oil and gas activity prohibition is presented below, showing added text (underlined) and deleted text (strike-through):

> Exploring for, developing~~, and~~ or producing hydrocarbons within the Sanctuary, except pursuant to leases executed prior to March 30, 1981, and except the laying of pipeline pursuant to exploring for, developing, or producing hydrocarbons~~, if the following oil spill contingency equipment is available at the site of such operations:~~
>
> ~~(i) 1500 feet of open ocean containment boom and a boat capable of deploying the boom;~~
>
> ~~(ii) One oil skimming device capable of open ocean use; and~~
>
> ~~(iii) Fifteen bales of oil sorbent material, and subject to all prohibitions, restrictions and conditions imposed by applicable regulations, permits, licenses or other authorizations and consistency reviews including those issued by the Department of the Interior, the Coast Guard, the Corps of Engineers, the Environmental Protection Agency and under the California Coastal Management Program and its implementing regulations~~.

Additional exceptions to this prohibition are proposed to be removed as follows, with deleted text in strike-through:

- ~~Except as may be necessary for the national defense~~

- ~~Except as may be necessary to respond to an emergency threatening life, property, or the environment~~

- ~~Except as may be permitted by the Director in accordance with 15 CFR secs. 922.48 and 922.72~~

The above exceptions are not specific to the current regulation, but rather are "boilerplate" generic exceptions to the current prohibitions. The proposed revised regulations fine-tune the exceptions, as has been done in the regulations for more recently designated sanctuaries, such that only if an exception is possibly applicable is it referenced for a particular prohibition. Accordingly, removal of the above exceptions is proposed because the limited exception for hydrocarbon exploration, development, or production is already provided within the regulation itself, because exploring for, developing, and producing hydrocarbons is not envisionable as a necessary activity to respond to an emergency threatening life, property, or the environment, and because such an activity could not meet the permit criteria requirements under 15 CFR 922.48 and 922.74 (previously 922.72). Department of Defense activities are addressed elsewhere in the regulations. Further, no such exceptions have ever been sought at the CINMS.

2.1.3 Prohibition 2 (Mineral Activities)

Prohibition 2 would be an addition to the existing regulations and would prohibit exploring for, developing, or producing minerals within the Sanctuary, except producing by-products incidental to authorized hydrocarbon production (see Prohibition 1 above). "Mineral" is defined in the program-wide regulations as clay, stone, sand, gravel, metalliferous ore, non-metalliferous ore, or any other solid material or other matter of commercial value.

Mineral extraction activities could involve scraping the Sanctuary's seabed surface and/or excavation of pits and tunnels into the seabed. This prohibition would protect Sanctuary resources and qualities from potentially damaging effects of offshore mining activities, including but not limited to: destruction and direct smothering of the benthic biota; alteration of the seabed surface profile; potential harm to fisheries; introduction of pollutants that could cause interference with the filtering, feeding, or respiratory functions of marine organisms; loss of food sources and habitat for some species; possible lowered photosynthesis and oxygen levels; and degraded appearance of the water itself.

A prohibition on mineral activities within the Sanctuary would be consistent with the prohibition on alteration on or in the submerged lands discussed below (see section 2.1.5).

There are other federal laws that deal generally with resources of the submerged lands and outer continental shelf and their development (*e.g.*, Deep Seabed Hard Mineral Resources Act, 30 U.S.C. 1441 *et seq.*; Submerged Lands Act, 43 U.S.C. 1301 *et seq.*; Outer Continental Shelf Lands Act, 43 U.S.C. 1331 *et seq.*). These laws require consideration of environmental impacts prior to issuance of resource development permits, and in some cases require monitoring of environmental impacts associated with any resource development activities. However, the Sanctuary's proposed new regulation to prohibit exploring for, developing or producing minerals within the Sanctuary differs from other federal regulations pertaining to resources on or in submerged lands and the continental shelf in that its purpose is to protect such resources within the Channel Islands National Marine Sanctuary.

The proposed new mineral activity prohibition is presented below:

> Exploring for, developing, or producing minerals within the Sanctuary, except producing by-products incidental to hydrocarbon production allowed.

2.1.4 Prohibition 3 (Discharging or Depositing)

Prohibition 3 would amend the regulation that prohibits discharging or depositing any material or other matter in the Sanctuary, with certain exceptions. This prohibition is necessary to protect Sanctuary resources and qualities from the effects of pollutants and other materials. The proposed changes to the existing regulation primarily serve the purposes of achieving increased clarity, providing more consistency with other more recently designated national marine sanctuaries' regulatory language, and helping to protect Sanctuary resources from negative influences originating outside CINMS boundaries.

The revised regulation would prohibit discharging or depositing from within or into the Sanctuary any material or other matter, with a revised list of exceptions. The revised regulation, as proposed in the DEIS, has been modified to incorporate changes proposed in the SDEIS. The revised prohibition and revised exceptions would be as follows, with deleted text shown in strike-through and added text shown in underline:

Discharging or depositing from within or into the Sanctuary any material or other matter except:

- Fish, ~~or~~ fish parts, ~~and~~ or chumming materials (bait) used in or resulting from lawful fishing activity within the Sanctuary, provided that such discharge or deposit is during the conduct of lawful fishing activity within the Sanctuary;

- Biodegradable effluent~~s~~ incidental to vessel use ~~of the Sanctuary~~ and generated by an operable Type I or II marine sanitation device~~s~~ (U.S. Coast Guard classification) approved in accordance with section 312 of the Federal Water Pollution Control Act, as amended, (FWPCA), 33 U.S.C. 1321 *et seq.*, from a vessel less than 300 gross registered tons (GRT) or an oceangoing ship without sufficient holding tank capacity to hold sewage while within the Sanctuary. Vessel operators must lock all marine sanitation devices in a manner that prevents discharge of untreated sewage;

- Biodegradable matter from: (1) Vessel deck wash down; (2) Vessel engine cooling water; (3) Graywater from a vessel less than 300 gross registered tons; (4) Graywater from an oceangoing ship without sufficient holding tank capacity to hold graywater while within the Sanctuary;

- ~~Meals on board vessels;~~

- Vessel engine or generator exhaust;

- Effluents routinely and necessarily discharged or deposited incidental to hydrocarbon exploration, development, or production ~~and exploitation activities~~ allowed under Prohibition 1 (see above);

- Discharges allowed under section 312(n) of the FWPCA.

These proposed revisions contain language improvements, clarifications, and modifications including: that the regulation applies to discharges and deposits “from within or into the Sanctuary”; that the exception for fish, fish parts, or chumming materials (bait) applies during the conduct of lawful fishing activity within the Sanctuary; that the exception for biodegradable effluent discharges from marine sanitation devices requires operable Type I or II marine sanitation devices approved by the United States Coast Guard in accordance with the Federal Water Pollution Control Act and applies only to vessels less

than 300 gross registered tons (GRT), or oceangoing ships without sufficient holding tank capacity to hold sewage while within the Sanctuary; and that an exception for graywater discharge would apply to vessels less than 300 gross registered tons (GRT), or oceangoing ships without sufficient holding tank capacity to hold graywater while within the Sanctuary. These clarifications and other changes are explained below.

2.1.4.1 From Within or Into the Sanctuary

The specification that this regulation applies to discharges or deposits "from within or into the sanctuary" seeks to clarify that not only discharges and deposits originating in the Sanctuary (including from vessels in the Sanctuary), but also discharges and deposits from aircraft above the Sanctuary, from docks and piers extending over the Sanctuary, and from cliffs and other lands adjacent to the Sanctuary, for example, are included in the prohibition.

2.1.4.2 Fish, Fish Parts, or Chumming Material

The specification that the exception for depositing fish, fish parts, or chumming material (bait) would only pertain to lawful fishing activities is to clarify that it does not include chumming for purposes of unlawful or non-fishing activities and that it does not include such matter not occurring during lawful fishing activity within the Sanctuary and dumping of fish wastes. Without this clarification the Sanctuary may be vulnerable to a possible increase in chumming practices for recreational or other purposes not associated with lawful fishing activities. NOAA considers tossing scraps overboard from filleting fish caught in the Sanctuary during the trip back to port to be part of the exception.

2.1.4.3 Vessel Sewage

The changes in wording with regard to the exception for vessel sewage discharge/deposit (biodegradable effluent) from a marine sanitation device are intended to provide greater clarity and specificity regarding the original intent of the regulation, as well as to restrict sewage discharge/deposit from large vessels (300 or more GRT).

Although the existing regulation requires that vessel wastes be "generated by a marine sanitation device" and this is meant to prohibit the dumping of untreated sewage into the Sanctuary, the proposed new language provides greater clarity with regard to this by specifying that such discharges are only allowed if generated by Type I or II marine sanitation devices. Type I and II marine sanitation devices treat wastes, while a Type III marine sanitation device does not.

During the DMP/DEIS public review period (May 15 through July 21, 2006) NOAA received a wide range of comments, including substantial public and agency comments about changes proposed for Sanctuary regulation of sewage discharges from large vessels. Comments included a request that NOAA adopt the discharge regulation under DEIS alternative 1, which would prohibit any sewage discharges from large vessels, whether treated or untreated. Comments also included a request that NOAA prohibit cruise ship discharges in Sanctuary waters. After reviewing the comments received (see Appendix B) and further analyzing the vessel discharge issues raised, NOAA decided to revise this regulation with regard to prohibition of sewage discharges/deposits from large vessels. NOAA's new preferred alternative (*i.e.*, proposed action) was outside the scope of the original DEIS, so it issued a Supplemental DEIS in March 2008 to request comments on the new revised alternative. NOAA has also considered the comments received on the SDEIS (Appendix B). Based on comments received on the DEIS and SDEIS NOAA proposes to provide that discharges/deposits generated by Type I or II marine sanitation devices only be allowed for small vessels (less than 300 GRT), as well as oceangoing ships (see proposed definition below) without sufficient holding tank capacity to hold sewage while within the Sanctuary. The

exception for oceangoing ships without sufficient holding tank capacity to hold sewage while within the Sanctuary is proposed because, unlike cruise ships and newer oceangoing ships, some older oceangoing ships are designed with very limited ability to retain treated sewage.

The primary purpose of prohibiting vessels 300 GRT or more (except oceangoing ships without sufficient holding tank capacity to hold sewage while within the Sanctuary) is to prevent potentially harmful effects of large-vessel sewage on Sanctuary resources and qualities, including water quality. This proposed regulation change offers a risk-averse approach that seeks to: maximize protection of Sanctuary water quality from large-vessel sewage discharges/deposits; maintain the Sanctuary's nationally significant esthetic and recreational qualities; and manage activities affecting the Sanctuary in a manner that complements existing regulatory authorities, as envisioned by the National Marine Sanctuaries Act (NMSA; 16 U.S.C. 1431). This revised proposed action would make the Sanctuary regulations in state waters (0 to 3 nautical miles or nmi) consistent with the standards of the California Clean Coast Act, and apply those same regulatory standards in federal waters of the Sanctuary (3 nmi to outer Sanctuary boundary).

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 (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). NOAA is concerned about possible impacts from large volumes of sewage discharges in the Sanctuary, whether treated or not, from large vessels. Such sewage discharges, in large volume, could also introduce an unpleasant esthetic impact to the Sanctuary (diminishing Sanctuary resources and its ecological, conservation, esthetic, recreational and other qualities).

This proposed regulation change also addresses additional concerns NOAA has about failure of conventional marine sanitation devices (MSDs) on large vessels to adequately treat sewage waste streams, and lack of monitoring of those waste streams. Large vessels may have either Type II MSDs that treat sewage, or Type III MSDs that hold sewage until it can be legally pumped out or discharged. In 2006, approximately 75% of the large oceangoing ships that called on California ports were using a Type II MSD. While these devices are designed to lower fecal coliform bacteria counts (to a standard of 200 fecal coliform per 100 ml of sample) and reduce total suspended solids (to a standard of 150 milligrams per liter), studies in Alaska of cruise ship waste water discharges have shown high rates of failure in the ability of conventional MSDs to meet legal discharge standards (Alaska Department of Environmental Conservation 2004). Furthermore, monitoring and testing of MSD discharges (outside of Alaska) is not legally required of large vessel operators, so reductions in treatment effectiveness may go undetected. In addition, while treatment reduces the concentration of active pathogens, the discharge still increases ambient concentrations of nitrogenous wastes and other chemicals that can affect primary production (phytoplankton) and other components of the Sanctuary food web.

A proposed regulatory definition for "oceangoing ship" is a private, commercial, government, or military vessel of 300 gross registered tons or more, not including cruise ships. This is consistent with the California Clean Coast Act definition.

A proposed regulatory definition for "cruise ship" is a vessel with 250 or more passenger berths for hire. This is consistent with the proposed Monterey Bay National Marine Sanctuary definition of "cruise ship" (71 FR 59050-59066).

2.1.4.4 Graywater

The original proposed action analyzed in the DEIS would have provided an exception to the discharge and deposit regulation for graywater. During the DMP/DEIS public review period NOAA received a wide range of comments about the proposed exception for graywater discharge, namely in its applicability to large vessels. After reviewing the comments received (see Appendix B) and further analyzing the vessel discharge issues raised, NOAA decided to revise this aspect of the discharge and deposit regulation and issued a Supplemental DEIS in March 2008. NOAA has also considered the comments received on the Supplemental DEIS (Appendix B).

This proposed regulation change would limit the graywater discharge/deposit exception to vessels less than 300 gross registered tons, and oceangoing ships without sufficient holding tank capacity to hold graywater while within the Sanctuary. The exception for oceangoing ships without sufficient holding tank capacity to hold graywater while within the Sanctuary is proposed because, unlike cruise ships and newer oceangoing ships, some older oceangoing ships are designed without the ability to retain graywater, and, as such, must discharge graywater directly as it is produced. A proposed regulatory definition for "graywater" is galley, bath, or shower water. Section 312 of the FWPCA remains the basis for NOAA's definition of graywater. If graywater is retained in an MSD and, consequently, mixed with any sewage, it is no longer considered graywater.

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 MSDs). 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). These results led the Alaska Department of Environmental Conservation (2001) to conclude that "…graywater is similar to blackwater in number of fecal coliform bacteria and total suspended solids, and that graywater should be treated prior to discharge." Graywater is by far the largest source of liquid waste on a cruise ship (Sweeting and Wayne 2003).

2.1.4.5 Meals from Vessels

Meals from vessels would no longer be an exception from the prohibition since they are considered marine debris; instead they should be deposited on land or outside the Sanctuary's seaward boundary, in accordance with other applicable laws. Without this revision existing Sanctuary regulations would continue to allow discharging or depositing food waste within the Sanctuary despite the fact that this conflicts with the more recent (1987) implementing regulations of the Act to Prevent Pollution from Ships (APPS), 33 CFR part 151 *et seq*., which prohibits such discharges from 0 to 3 nmi from shore, and permits them from 3 to 12 nmi from shore only if the food waste has been ground to less than 1 inch. Since the revised regulation would prohibit discharge/deposit of food wastes in the entire Sanctuary, Sanctuary regulations would be consistent with the APPS prohibition on discharge of food wastes from 0-3 nmi offshore, and would augment the protection afforded by the APPS for the 3-6 nmi offshore zone of the Sanctuary by prohibiting discharge/deposit of food wastes regardless of whether or not they have been ground to within one inch.

2.1.4.6 Deck Wash Down, Cooling Water, and Engine Exhaust

Additional clarity and specificity have been added to the revised exceptions for deck wash down, cooling water, and engine exhaust. These revisions clarify the intent of the exceptions and that they apply strictly to discharges and deposits incidental to vessel use within the Sanctuary.

2.1.4.7 Discharging or Depositing from Beyond the Boundary

The revised discharge/deposit regulation would also be amended to include a new prohibition on discharging or depositing from beyond the boundary of the Sanctuary any material or other matter that subsequently enters the Sanctuary and injures a Sanctuary resource or quality, except the exceptions listed above and fish, fish parts, or chumming materials (bait) used in or resulting from lawful fishing activity beyond the boundary of the Sanctuary, provided that such discharge or deposit is during the conduct of lawful fishing activity there. "Sanctuary resource" is defined at 15 CFR 922.3 as "any living or non-living resource of a national marine sanctuary that contributes to the conservation, recreational, ecological, historical, research, educational, or aesthetic value of the Sanctuary, including, but not limited to, the substratum of the area of the Sanctuary, other submerged features and the surrounding seabed, carbonate rock, corals and other bottom formations, coralline algae and other marine plants and algae, marine invertebrates, brine-seep biota, phytoplankton, zooplankton, fish, seabirds, sea turtles and other marine reptiles, marine mammals and historical resources." "Sanctuary quality" is defined at 15 CFR 922.3 as "any of those ambient conditions, physical-chemical characteristics and natural processes, the maintenance of which is essential to the ecological health of the Sanctuary, including, but not limited to, water quality, sediment quality and air quality." This revised regulation would apply, for example, to situations such as a hazardous substance spill that originates from beyond the boundary of the Sanctuary but subsequently enters and injures CINMS resources.

This modification would provide consistency with other more recently designated sanctuaries' regulatory language. For example, this prohibition is found in the regulations for Monterey Bay, Flower Garden Banks, Stellwagen Bank, Olympic Coast, and the Florida Keys national marine sanctuaries.

While other federal laws regulate dumping of particular types of waste in various regions of U.S. waters, the proposed regulation is unique in its recognition that regardless of the point of discharge or deposit, material or other matter discharged or deposited in the surrounding fluid ocean environment may drift into the Sanctuary and injure CINMS' nationally significant resources and qualities. The proposed regulatory prohibition would afford a legal deterrent through applicability of NMSA civil penalties, and help to protect Sanctuary resources from negative influences outside CINMS boundaries.

2.1.4.8 Other Exceptions

Additional cross-cutting exceptions[6] would apply to this regulation. These exceptions are presented below, using added text (underlined) and deleted text (strike-through). Military activity exemptions are discussed separately at 2.1.15.

- Except as ~~may be permitted by the Director~~ in accordance with <u>the scope, purpose, terms, and conditions of a National Marine Sanctuary permit issued pursuant to</u> 15 CFR ~~secs.~~ 922.48 and 922.7~~2~~<u>4</u>.

- Except ~~as may be~~ <u>for an activity</u> necessary to respond to an emergency threatening life, property, or the environment.

[6] Cross-cutting exceptions are those that apply to multiple Sanctuary regulations.

- Except for an activity necessary for valid law enforcement purposes in the Sanctuary.

2.1.5 Prohibition 4 (Altering the Seabed)

The intent of this revised prohibition is to preclude drilling into, dredging, or otherwise altering the submerged lands (the "submerged lands" language is a proposed substitution—see section 2.1.1 above) of the Sanctuary; or constructing or placing any structure, material, or other matter on or in the submerged lands of the Sanctuary, except as incidental to and necessary to:

- Anchor a vessel;
- Install an authorized navigational aid;
- Conduct lawful fishing activity;
- Lay pipeline pursuant to exploring for, developing, or producing hydrocarbons (see Prohibition 1); or
- Explore for, develop, or produce hydrocarbons as allowed (under Prohibition 1).

The proposed revised seabed alternation prohibition is presented below, showing added text (underlined) and deleted text (strike-through):

~~Except in connection with the laying of any pipeline as allowed by paragraph (a)(1) of this section, within 2 NM of any Island: (ii)~~Drilling into ~~through the seabed~~, ~~(iii) D~~dredging, or otherwise altering the ~~seabed~~ submerged lands of the Sanctuary ~~in any way, other than;~~ ~~(i)~~ or ~~C~~constructing or placing any structure ~~other than a navigation aid~~, material, or other matter on or in the submerged lands of the Sanctuary, except as incidental to and necessary to:

~~(A)~~(i) ~~To a~~Anchor a vessel~~s~~;

(ii) Install an authorized navigational aid;

~~(B)~~ (iii) ~~To bottom trawl from a commercial fishing vessel~~Conduct lawful fishing activity;

(iv) Lay pipeline pursuant to exploring for, developing, or producing hydrocarbons; or

(v) Explore for, develop, or produce hydrocarbons as allowed by subparagraph (a)(1) of this section.

The most substantive proposed revision to the regulations is the applicability of the prohibition to the entire Sanctuary, rather than merely to the first 2 nmi from Island shores as is currently specified. Expanding the geographic extent of this prohibition to the entire Sanctuary area would ensure protection of its diverse accentuated bottom relief, varied substrate and benthic habitats.

Other federal law (*e.g.*, the Rivers and Harbors Act, 33 U.S.C. 401 *et seq*.; and the Wreck Act, 33 U.S.C. 409 *et seq*.) prohibit unauthorized deposits upon, and placement of structures on submerged lands with the intent of prohibiting potential obstructions to navigation. Unlike these other acts, this proposed revised regulation focuses on place-based protection of submerged lands within the Sanctuary and the nationally significant resources on or in them. A further distinction is that the revised regulation would protect the submerged lands regardless of whether or not an obstruction to navigation is at issue.

Proposed revisions to this regulation would also replace the term "seabed" with "submerged lands," to be consistent with the NMSA, and consistent with regulations at more recently designated sanctuaries. Another proposed change to this regulation would modify the exception for "bottom trawling from a commercial vessel" to provide an exception for activities incidental and necessary to "conduct lawful fishing activity." This broadening of the exception would encompass other bottom-touching gear types, such as pots and traps, which the drafters of the original regulations apparently did not realize could alter the seabed. This proposed change would thus remove any uncertainty about the existing regulation's applicability to such gear types.

Additional cross-cutting exceptions would apply to this regulation. These exceptions are presented below, using added text (underlined) and deleted text (strike-through). Military activity exemptions are discussed separately at 2.1.15.

- Except as ~~may be permitted by the Director~~ in accordance with the scope, purpose, terms, and conditions of a National Marine Sanctuary permit issued pursuant to 15 CFR ~~secs.~~ 922.48 and 922.7~~2~~4.

- Except ~~as may be~~ for an activity necessary to respond to an emergency threatening life, property, or the environment.

- Except for an activity necessary for valid law enforcement purposes in the Sanctuary.

2.1.6 Prohibition 5 (Abandoning)

This new regulation would prohibit abandoning, by which is meant leaving without intent to remove, any structure, material, or other matter on or in the submerged lands of the Sanctuary. This proposed regulation would add greater specificity to the types of seabed disturbances currently not allowed by adding "abandoning" structures, material, or other matter as a prohibition. This change is important to protect the CIMNS from matter abandoned by Sanctuary users, *e.g.*, the possibility of a wrecked vessel containing hazardous materials being left in place, or seabed research equipment not being removed after its permitted use is concluded.

Additional cross-cutting exceptions would apply to this regulation. These exceptions are presented below, using added text (underlined) and deleted text (strike-through). Military activity exemptions are discussed separately at 2.1.15.

- Except as in accordance with the scope, purpose, terms and conditions of a National Marine Sanctuary permit issued pursuant to 15 CFR 922.48 and 922.74.

- Except for an activity necessary to respond to an emergency threatening life, property, or the environment.

- Except for an activity necessary for valid law enforcement purposes in the Sanctuary.

If a permit has been obtained from the CINMS (pursuant to the NMSP and CINMS permit regulations at 15 CFR 922.48 and 922.74, respectively), the terms of such a permit would likely require the eventual removal of such items. Under appropriate circumstances, such as an emergency threatening loss of life or property, the emergency exception could allow for temporary abandonment of an item on the seafloor. For example, this exception could allow for temporary abandonment of an anchor in the event of a boating emergency, or of research or photographic equipment during a dive emergency. However, the responsible party would subsequently have an obligation to remove these items.

The proposed regulation, if adopted, would be the only federal regulation to afford all Sanctuary submerged lands and associated resources complete protection from abandoned structures, material or other matter. The existing Sanctuary regulation that prohibits disturbance of the seabed offers partial protection from abandonment of structures, material or other matter, in so far as it prohibits such activities that disturb the seabed. However, the existing seabed protection regulation only provides protection from disturbance to the seabed from 0 to 2 nmi offshore of the Islands, and does not expressly prohibit abandoning any structure, material, or other matter thereupon. National Park Service regulations (36 CFR 2.22(a)(1)) prohibit abandoning property within units of the National Park System, and as such apply from 0-1 nmi offshore of the Islands. As noted under prohibition 4 above, other federal regulations (*e.g.*, the Rivers and Harbors Act, 33 U.S.C. 401 *et seq*.; and the Wreck Act, 33 U.S.C. 409 *et seq*.) prohibit unauthorized deposits upon, and placement of structures on submerged lands with the intent of prohibiting potential obstructions to navigation. Unlike these other acts, this proposed regulation focuses on place-based protection of submerged lands within the Sanctuary and the nationally significant resources on or in them. A further distinction is that the proposed regulation protects the sea floor regardless of whether or not an obstruction to navigation is at issue. Thus, only the proposed regulation offers express protection against abandonment of structures, material or other matter throughout the entire Sanctuary area, and provides added deterrence in the form of NMSA-authorized civil penalties of up to $130,000 per incident, per day.

The proposed regulation would also be consistent with the U.S. Ocean Action Plan: The Bush Administration's Response to the U.S. Commission on Ocean Policy (2004). In this Action Plan the Administration acknowledges the harmful effects marine debris has on valuable marine resources, and calls for the re-establishment of the Interagency Marine Debris Coordinating Committee (re-established in December 2004), of which NOAA is a member.

2.1.7 Prohibition 6 (Nearshore Operation of Vessels)

This revised regulation would prohibit the operation—within 1 nmi of an Island —of:

- Any vessel engaged in the trade of carrying cargo, including but not limited to tankers and other bulk carriers and barges;
- Any vessel engaged in the trade of servicing offshore installations; and
- Any vessel of 300 registered gross tons or more.

The two existing exceptions to this prohibition would be fishing and kelp harvesting vessels, and vessels transporting persons or supplies to or from an Island.

The existing (1982) regulation allows for the legal approach of all vessels that do not fall within the first two categories listed above, regardless of their size, such as cruise ships, privately owned vessels, charter vessels, vessels owned by educational, research or restoration NGOs, and salvage vessels. The proposed regulation differs from the current regulation in that it adds the prohibition regarding vessels of 300 gross tons or more. The intent of this additional prohibition is to protect the sensitive nearshore areas of the islands, including kelp forests, rocky reefs, and other areas, from the potential impacts of large-vessel groundings or collisions, including, but not limited to, cruise ships. The NMSP developed the proposed modified prohibition since it more directly addresses the Sanctuary's concern that large vessels, regardless of their purpose, not approach and put at risk sensitive nearshore areas of the Sanctuary.

Additional cross-cutting exceptions would apply to this regulation. These exceptions are presented below, using added text (underlined) and deleted text (strike-through). Military activity exemptions are discussed separately at 2.1.15.

- Except as ~~may be permitted by the Director~~ in accordance with the scope, purpose, terms, and conditions of a National Marine Sanctuary permit issued pursuant to 15 CFR ~~secs.~~ 922.48 and 922.7~~2~~4.

- Except ~~as may be~~ for an activity necessary to respond to an emergency threatening life, property, or the environment.

- Except for an activity necessary for valid law enforcement purposes in the Sanctuary.

These exceptions could allow, for example, a large research vessel to approach within 1 nmi of the Islands if a permit for this activity has been obtained from the CINMS (pursuant to the NMSP and CINMS permit regulations at 15 CFR 922.48 and 922.74, respectively).

2.1.8 Prohibition 7 (Disturbing a Seabird or Marine Mammal by Aircraft Overflight)

This revised regulation prohibits disturbance of a seabird or marine mammal by flying a motorized aircraft at less than 1,000 feet over the waters within 1 nmi of any Island, except if allowed under Prohibition 9 (see below), to engage in kelp bed surveys, or to transport persons or supplies to or from an Island.

The proposed revised regulation is presented below, showing added text (underlined) and deleted text (strike-through):

> Disturbing a seabird~~s~~ or marine mammal~~s~~ by flying motorized aircraft at less than 1000 feet over the waters within one ~~NM~~nmi of any Island, except (if allowed under subparagraph (a)(9) of this section):
>
> ~~(i) For enforcement purposes;~~
>
> (i~~i~~) to engage in kelp bed surveys; or
>
> (iii~~i~~) to transport persons or supplies to or from an Island.

This modification would not result in a substantial change to the regulations. One difference is that this proposed modified regulation includes a new parenthetical clause to emphasize that the exceptions to this regulation of course do not override the obligation to comply with proposed Prohibition 9 (taking a marine mammal, seabird, or sea turtle).

Additional cross-cutting exceptions would apply to this regulation. For example, specified aircraft overflight likely to cause marine mammal or seabird disturbance under 1,000 feet near the Islands could be allowed if the necessary permit(s) had been obtained from the CINMS (pursuant to the NMSP and CINMS permit regulations at 15 CFR 922.48 and 922.74, respectively), and any other relevant state or federal authorities.

These exceptions are presented below, using added text (underlined) and deleted text (strike-through). Military activity exemptions are discussed separately at 2.1.15.

- Except as ~~may be permitted by the Director~~ in accordance with the scope, purpose, terms, and conditions of a National Marine Sanctuary permit issued pursuant to 15 CFR ~~secs.~~ 922.48 and 922.7~~2~~4.

- Except ~~as may be~~ for an activity necessary to respond to an emergency threatening life, property, or the environment.

- Except for an activity necessary for valid law enforcement purposes in the Sanctuary.

2.1.9 Prohibition 8 (Moving, Removing, Possessing or Injuring a Sanctuary Historical Resource)

This revised regulation would prohibit moving, removing, injuring, or possessing, or attempting to move, remove, injure, or possess a CINMS historical resource. Revisions to the existing (1982) regulation include adding "moving" and "possessing"; replacing "damage" with "injure," a term defined in the program-wide regulations (15 CFR 922.3); and adding "attempting" to move, remove, injure, or possess as a prohibition. In addition, the proposed regulation would also replace "historical or cultural resource" with "Sanctuary historical resource" to be consistent with regulatory language used at several other more-recently designated national marine sanctuaries (see NMSP definition of "historical resource" at 15 CFR 922.3).

The proposed revised prohibition is presented below, showing added text (underlined) and deleted text (strike-through):

> Moving, removing, injuring, or possessing, or attempting to move, remove, injure, or possess ~~or damaging any~~ a Sanctuary historical ~~or cultural~~ resource.

Cross-cutting exceptions would apply to this regulation. These exceptions are presented below, using added text (underlined) and deleted text (strike-through). Military activity exemptions are discussed separately at 2.1.15.

- Except as ~~may be permitted by the Director~~ in accordance with the scope, purpose, terms, and conditions of a National Marine Sanctuary permit issued pursuant to 15 CFR ~~secs.~~ 922.48 and 922.7~~2~~4.

- Except ~~as may be~~ for an activity necessary to respond to an emergency threatening life, property, or the environment.

- Except for an activity necessary for valid law enforcement purposes in the Sanctuary.

The intent of this modification is to provide added protection to the fragile, finite, and non-renewable nationally significant historical resources of the Sanctuary so they may be studied, and so appropriate information about them may be made available for the benefit of the public. While the Antiquities Act (16 U.S.C. 431 *et seq.*), the Archaeological Resources Protection Act (16 U.S.C. 470aa *et seq.*), National Park Service Regulations (36 CFR part 2) and Channel Islands National Park regulations (36 CFR 7.84) collectively prohibit appropriating or possessing, excavating, destroying, injuring, removing, damaging, altering, defacing, displacing, and tampering with cultural, archeological, paleontological and historical resources, ruins or monuments, abandoned water or airborne craft (and cargo pertaining thereto), several aspects of the revised regulation would provide unique protection to historical resources of the Sanctuary. Among these unique protections are: special place-based protection to nationally significant historical resources found solely within the Sanctuary, protection afforded to such resources within the entire

Sanctuary area (whereas National Park regulations only apply from 0 to 1 nmi offshore from the islands), prohibition of *attempting* to move, remove, injure, or possess any Sanctuary historical resource, and civil penalties of up to $130,000 per incident, per day. This site-specific attention and regulatory authority is seen by the NMSP as essential, and furthermore in need of the slight changes proposed above in order to increase clarity and effectiveness.

2.1.10 Prohibition 9 (Taking a Marine Mammal, Sea Turtle, or Seabird)

This new regulation would prohibit taking any marine mammal, sea turtle, or seabird within or above the CINMS, except as authorized under the Marine Mammal Protection Act, as amended (MMPA), 16 U.S.C. 1361 *et seq.*; Endangered Species Act, as amended (ESA), 16 U.S.C. 1531 *et seq.*; Migratory Bird Treaty Act, as amended (MBTA), 16 U.S.C. 703 *et seq.*; or any regulation, as amended, promulgated under one of these acts. Per the NMSP program-wide regulations, "take" or "taking" means: (1) for any marine mammal, sea turtle, or seabird listed as either endangered or threatened pursuant to the ESA, to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect or injure, or to attempt to engage in any such conduct; (2) for any other marine mammal, sea turtle, or seabird, to harass, hunt, capture, kill, collect or injure, or to attempt to engage in any such conduct. For the purposes of both (1) and (2) of this definition, this includes, but is not limited to, collecting any dead or injured marine mammal, sea turtle, or seabird, or any part thereof; restraining or detaining any marine mammal, sea turtle, or seabird, or any part thereof, no matter how temporarily; tagging any sea turtle, marine mammal, or seabird; operating a vessel or aircraft or any other act that results in the disturbance or molestation of any marine mammal, sea turtle, or seabird (15 CFR 922.3).

Additional cross-cutting exceptions would apply to this regulation. These exceptions are presented below, using added text (underlined) and deleted text (strike-through). Military activity exemptions are discussed separately at 2.1.15.

- Except as in accordance with the scope, purpose, terms and conditions of a National Marine Sanctuary permit issued pursuant to 15 CFR 922.48 and 922.74.

- Except for an activity necessary to respond to an emergency threatening life, property, or the environment.

- Except for an activity necessary for valid law enforcement purposes in the Sanctuary.

The intent of this regulation is to bring a special focus to protection of the diverse and vital marine mammal and seabird populations found within the CINMS, without complicating existing authorization and permitting procedures and requirements. The MMPA, ESA, and MBTA, and implementing regulations associated with each, prohibit take of certain species unless authorized under certain circumstances. The Sanctuary's proposed regulation would not apply if an activity (including a federal or state-approved fishery) that does or might cause take of marine mammals, seabirds or sea turtles has been authorized to do so under the MMPA, ESA, or MBTA or any implementing regulation promulgated under one of these acts. With this proposed regulation, if NMFS or the USFWS issues a permit for the take of a marine mammal, seabird, or sea turtle, it would not be regulated by the NMSP and therefore would not require a permit from the Sanctuary unless the activity would also violate another Sanctuary regulation. Unlike the MMPA, ESA, and MBTA, and their implementing regulations, the proposed regulation places special emphasis on providing added protection to the marine mammal, sea turtle and seabird populations of the CINMS. Such area-specific focus is seen by the NMSP as important and complementary to other resource protection agencies, especially given that other federal and state authorities must spread limited resources over much wider geographic areas. In addition, this regulation would provide a greater deterrent per the maximum civil penalty provided under the NMSA (up to $130,000 per incident, per day)

than the penalties provided by the MMPA, ESA and MBTA. Further, the prohibition would cover all marine mammals, sea turtles, and seabirds within or above the Sanctuary. This regulation would be consistent with regulations at the more recently designated national marine sanctuaries established at Monterey Bay, Stellwagen Bank, Olympic Coast, and the Florida Keys.

2.1.11 Prohibition 10 (Possessing a Marine Mammal, Sea Turtle, or Seabird)

This new regulation would prohibit possessing within the Sanctuary (regardless of where taken from, moved, or removed from) any marine mammal, sea turtle, or seabird, except as authorized by the MMPA, ESA, MBTA, or any regulation, as amended, promulgated under the MMPA, ESA, or MBTA.

Additional cross-cutting exceptions would apply to this regulation. These exceptions are presented below, using added text (underlined) and deleted text (strike-through). Military activity exemptions are discussed separately at 2.1.15.

- Except as in accordance with the scope, purpose, terms and conditions of a National Marine Sanctuary permit issued pursuant to 15 CFR 922.48 and 922.74.

- Except for an activity necessary to respond to an emergency threatening life or the environment.

- Except for an activity necessary for valid law enforcement purposes in the Sanctuary.

Similar to Prohibition 9, this proposed regulation would serve to provide a greater deterrent against violations of existing laws protecting marine mammals, seabirds and sea turtles. The proposed regulation differs from the MMPA, ESA and MBTA in its special focus on providing added protection to the marine mammal, seabird, and sea turtle populations of the CINMS. Such area-specific focus is seen by the NMSP as important and complementary to other resource protection agencies, especially given that other federal and state authorities must spread limited resources over much wider geographic areas. In addition, this regulation would provide a greater deterrent per the maximum civil penalty provided under the NMSA (up to $130,000 per incident, per day) than the penalties provided by the MMPA, ESA and MBTA. This proposed regulation would be consistent with more recent regulations adopted by other national marine sanctuaries and would enhance protection provided by Prohibition 9 (see above).

With this proposed regulation, if NMFS or the USFWS issues a permit for the possession of a marine mammal, seabird, or sea turtle, it would not be regulated by the NMSP and therefore would not require a permit from the Sanctuary unless the activity would also violate another Sanctuary regulation.

2.1.12 Prohibition 11 (Tampering with Signs)

This new regulation would prohibit marking, defacing, damaging, moving, removing, or tampering with any sign, notice, or placard, whether temporary or permanent, or any monument, stake, post, or other boundary marker related to the Sanctuary.

Additional cross-cutting exceptions would apply to this regulation. These exceptions are presented below, using added text (underlined) and deleted text (strike-through). Military activity exemptions are discussed separately at 2.1.15.

- Except for an activity necessary to respond to an emergency threatening life, property, or the environment.

- Except for an activity necessary for valid law enforcement purposes in the Sanctuary.

This prohibition is designed to protect Sanctuary property used for signage purposes, including demarcation, enforcement, conveying regulatory information, education, outreach, and research. This new proposed regulation would be consistent with some other national marine sanctuaries' regulations.

2.1.13 Prohibition 12 (Releasing an Introduced Species)

This new regulation would prohibit introducing or otherwise releasing an introduced species from within or into the Sanctuary, except striped bass (*Morone saxatilis*) released during catch and release fishing activity. A proposed regulatory definition for "Introduced species" is: (1) species (including but not limited to any of its biological matter capable of propagation) that are 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.

Additional cross-cutting exceptions would apply to this regulation. These exceptions are presented below, using added text (underlined) and deleted text (strike-through). Military activity exemptions are discussed separately at 2.1.15.

- Except for an activity necessary to respond to an emergency threatening life, property, or the environment.

- Except for an activity necessary for valid law enforcement purposes in the Sanctuary.

The intent of the prohibition is to prevent injury to Sanctuary resources and qualities, and protect CINMS ecosystem biodiversity and function, all of which are put at risk by introduced species being introduced or otherwise released into the Sanctuary. 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). 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 identified 16 non-native sessile invertebrate species in the Channel Islands region 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). This proposed regulation is also being planned at California's Monterey Bay, Cordell Bank, and Gulf of the Farallones National Marine Sanctuaries and is based on a comparable prohibition in place at the Florida Keys National Marine Sanctuary.

A discussion of the type of impacts introduced species can have on native coastal marine species is presented at section 3.5.5.

Several existing federal and California laws and regulations address introduced species, but none comprehensively prohibit introducing or otherwise releasing introduced species (as defined above) into all waters within the Sanctuary. The Nonindigenous Aquatic Nuisance Prevention and Control Act, as amended by the National Invasive Species Act, (16 U.S.C. 4701 *et seq.*) focuses on preventing the introduction and spread of aquatic nuisance species through ballast water, and requires ballast water management programs for various federal departments. The Lacey Act (16 U.S.C. 3371 *et seq.*) prohibits the trafficking and possession of any wildlife, fish, or plant taken in violation of domestic, foreign, state, or Indian tribal law. National Park Service regulations in effect at Channel Islands National Park (whose seaward boundary extends to 1 nmi offshore from the islands) prohibit introducing wildlife, fish or plants, including their reproductive bodies, into a Park area ecosystem (36 CFR 2.1(a)(2)). California law (Fish and Game Code 15007) prohibits spawning, incubating or cultivating transgenic and exotic species (as defined in the section) in California marine waters (0 to 3 nmi offshore). The proposed prohibition differs

from these other laws and regulations in its: place-based protections specifically for CINMS, prohibition of transgenic species introductions in both state and federal waters of the Sanctuary, and prohibition of introducing or otherwise releasing species beyond the 1 nmi offshore Channel Islands National Park boundary. Furthermore, the proposed Sanctuary regulation establishes a deterrent against intentional and unintentional introductions or other releases of introduced species into the Sanctuary through civil penalty (up to $130,000 per incident, per day) under the NMSA.

The proposed prohibition includes an exception for striped bass (*Morone saxatilis*) released during catch and release fishing activity. Striped bass were intentionally introduced in California in 1879, and in 1980 the California Department of Fish and Game initiated a striped bass hatchery program to support the striped bass sport fishery, which according to the California Department of Fish and Game is one of the most important fisheries on the Pacific Coast. The California Department of Fish and Game manages the striped bass fishery through a Striped Bass Management Conservation Plan. (Leet *et al*. 2001) The proposed regulation is intended to acknowledge that striped bass are the focus of an established state-managed sport fishery and since they consequently may be caught within the Sanctuary make an exception for striped bass released during catch and release fishing activity.

2.1.14 Prohibition 13 (Operation of Motorized Personal Watercraft)

This new regulation would prohibit operating a motorized personal watercraft (MPWC) within waters of the Channel Islands National Park (CINP or Park), established by 16 U.S.C. 410(ff), which states that the boundaries of Channel Islands National Park include San Miguel and Prince Islands, Santa Rosa, Santa Cruz, Anacapa and Santa Barbara Islands, including the rocks, islets, submerged lands, and waters within one nautical mile of each island, as depicted on the map entitled, "Proposed Channel Islands National Park" numbered 159-20,008 and dated April 1979. The regulation, including the definition, would mirror the National Park Service regulation (36 CFR 1.4(a)): "motorized personal watercraft" refers to a vessel, usually less than 16 feet in length, which uses an inboard, internal combustion engine powering a water jet pump as its primary source of propulsion. The vessel is intended to be operated by a person or persons sitting, standing or kneeling on the vessel, rather than within the confines of the hull. The length is measured from end to end over the deck excluding sheer, meaning a straight line measurement of the overall length from the foremost part of the vessel to the aftermost part of the vessel, measured parallel to the centerline. Bow sprits, bumpkins, rudders, outboard motor brackets, and similar fittings or attachments, are not included in the measurement. Length is stated in feet and inches."

Several cross-cutting exceptions would apply to this regulation. These exceptions are presented below, using added text (underlined) and deleted text (strike-through). Military activity exemptions are discussed separately at 2.1.15.

- Except as in accordance with the scope, purpose, terms and conditions of a National Marine Sanctuary permit issued pursuant to 15 CFR 922.48 and 922.74.

- Except for an activity necessary to respond to an emergency threatening life or the environment.

- Except for an activity necessary for valid law enforcement purposes in the Sanctuary.

This proposed regulation would mirror an existing National Park Service regulation in place at the CINP, in which use of motorized personal watercraft is banned within CINP waters. The National Park Service and CINP have indicated their support for this proposed Sanctuary prohibition as it would be consistent with the National Park Service ban, and as it would provide added enforcement benefits, for example, higher penalties and those penalties would be levied through an administrative (civil) rather than a criminal process. CINP has observed an increase in use of motorized personal watercraft within the Park

over the last several years, and Park staff issue several dozen warnings per year for violation of this ban (Fitzgerald 2005). In combination with the National Park Service ban, this proposed regulation is intended to provide an added deterrence for purposes of ensuring protection of Sanctuary wildlife and habitats.

MPWCs operate in a manner unique among recreational vehicles and pose a threat to wildlife. Their shallow draft enables them to penetrate areas not available to conventional motorized watercraft (NPS 2000, MOCZM 2002). The high speed and maneuverability of MPWCs, along with the tendency to operate them near the shore and in a repeated fashion within a confined area, results in recurring disturbance to animals and habitats (Rodgers and Smith 1997, Snow 1989). Studies have shown that the use of MPWCs in nearshore areas can increase flushing rates, reduce nesting success of certain bird species, impact spawning fish, and reduce fishing success (Burger 1998, Snow 1989). The National Park Service (2000, 2004) identified several of these impacts along with interruption of normal activity, avoidance and displacement, loss of habitat use, interference with movement, direct mortality, interference with courtship, alteration of behavior, change in community structure, elevated noise levels, and damage to aquatic vegetation. Further, offshore marine mammals or surfacing birds may be unaware of the presence of these vehicles due to their low frequency sound; when the inability to detect the vehicles is combined with their high speed and rapid and unpredictable movements, both animals and operators are at risk (Snow 1989).

A Massachusetts Office of Coastal Zone Management study (MOCZM 2002) proposed a variety of different management techniques regarding MPWCs, including an outright ban for particularly sensitive or difficult enforcement areas. CINMS fits both of these criteria, with many rare, endangered or sensitive species and a remote environment which makes behavior-based enforcement very difficult without extensive enforcement resources.

A review of information currently available from MPWC manufacturers indicates that they have made efforts to reduce emissions and noise through use of more efficient four-stroke engines as well as other technology (*e.g.*, Bombardier Recreational Products, Inc. 2005a, 2005b; Personal Watercraft Industry Association 2005). However, NOAA's prohibition on the operation of MPWC within one mile of the islands is due primarily to the potential for wildlife disturbance rather than concerns about emissions. Industry improvements in noise and other emissions do not address impacts associated with the high speed, maneuverability, shallow draft, and nearshore operation of MPWC. While emissions and noise from MPWC have been reduced, it is not clear that they are now insignificant. NOAA is concerned about the effects of oscillating sound caused by persistent throttling of the engine during repeated acceleration/deceleration within the surf zone, which is often necessary to avoid capsizing and rolling. Research and observations have shown that this frequent oscillating sound pattern is particularly disruptive to wildlife.

The area within one nmi of island shores experiences the greatest visitor use and impact to sensitive nearshore Sanctuary marine resources. The proposed regulation would serve as an added deterrent to illegal motorized personal watercraft use within the nearshore area and other waters of the Channel Islands National Park, and would carry a maximum civil penalty of $130,000 per incident, per day.

See also discussion of MPWC in section 3.5.8.2.

2.1.15 Department of Defense Military Activities

This revised regulation would update, clarify and otherwise modify the existing exemption for Department of Defense military activities. Specifically, the regulation would provide that prohibitions 3 through 13 above do not apply to military activities carried out by the Department of Defense as of the

effective date of the revised regulations and specifically identified in section 3.5.9 of this FEIS, entitled "Department of Defense Activities" ("pre-existing activities"). Other military activities carried out by DOD may be exempted by the Director after consultation between the Director and DOD.

This revised regulation would also state that a military activity carried out by DOD as of the effective date of the revised Sanctuary regulations, and specifically identified in the section entitled "Department of Defense Activities" of the FMP/FEIS, is not considered a pre-existing activity if:

- The activity is modified in such a way that requires the preparation of an environmental assessment or environmental impact statement under the National Environmental Policy Act, 42 U.S.C. 4321 *et seq*., relevant to a Sanctuary resource or quality;

- The activity is modified, including but not limited to changes in location or frequency, in such a way that its possible adverse effects on Sanctuary resources or qualities are significantly greater than previously considered for the unmodified activity;

- The activity is modified, including but not limited to changes in location or frequency, in such a way that its possible adverse effects on Sanctuary resources or qualities are significantly different in manner than previously considered for the unmodified activity; or

- There are new circumstances or information relevant to a Sanctuary resource or quality that were not addressed in the FEIS/MP.

Consistent with the NMSA, this revised regulation would also provide that in the event of destruction of, loss of, or injury to a Sanctuary resource or quality resulting from an incident, including, but not limited to, discharges, deposits, and groundings caused by a Department of Defense activity, the Department of Defense, in coordination with the Director, must promptly prevent and mitigate further damage and must restore or replace the Sanctuary resource or quality in a manner approved by the Director. In addition, this proposed regulation would require that all Department of Defense activities be carried out in a manner that avoids to the maximum extent practicable any adverse impacts on Sanctuary resources and qualities.

2.1.16 Regulation on Permit Procedures and Issuance Criteria

Proposed permitting criteria and procedures for CINMS are more thoroughly and clearly described than the existing regulatory language on permits, introduce some new express requirements for both permittee and CINMS designed to ensure that permitted projects are appropriate for the Sanctuary, and offer additional flexibility for handling various permitting situations that could arise. Below are the proposed revisions to the procedures and issuance criteria for obtaining a permit from the CINMS to conduct an activity otherwise prohibited in the Sanctuary, with deleted text shown in strike-through and added text underlined. Following the proposed revisions is a textual explanation of the difference between the existing and proposed revised permit regulations, as well as an explanation of the reasons for and intent of the proposed revisions.

Proposed revisions to Sanctuary permit procedures and issuance criteria:

(a) A person may conduct an activity prohibited by 922.72(a)(3) through (10) and (a)(13), or 922.73, if such activity is specifically authorized by, and conducted in accordance with the scope, purpose, terms, and conditions of, a permit issued under 922.48 and this section.~~Any person in possession of a valid permit issued by the Director in accordance with this section~~

~~and 922.48 may conduct any activity in the Sanctuary prohibited under 922.71 if such activity is either:~~

~~(1) Research related to the resources of the Sanctuary,~~
~~(2) To further the educational value of the Sanctuary; or~~
~~(3) For salvage or recovery operations.~~

(b) The Director, at his or her sole discretion, may issue a permit, subject to terms and conditions as he or she deems appropriate, to conduct an activity prohibited by 922.72(a)(3) through (10) and (a)(13), or 922.73, if the Director finds that the activity:

(1) Is appropriate research designed to further understanding of Sanctuary resources and qualities;
(2) Will further the educational value of the Sanctuary;
(3) Will further salvage or recovery operations in or near the Sanctuary in connection with a recent air or marine casualty;
(4) Will assist in managing the Sanctuary; or
(5) Will further salvage or recovery operations in connection with an abandoned shipwreck in the Sanctuary title to which is held by the State of California.~~Permit applications shall be addressed to: Director, Office of Ocean and Coastal Resource Management, ATTN: Manager, Channel Islands National Marine Sanctuary, 113 Harbor Way, Santa Barbara, CA 93109.~~

(c) The Director may not issue a permit under 922.48 and under this section unless the Director also finds that:

(1) The proposed activity will have at most short-term and negligible adverse effects on Sanctuary resources and qualities;
(2) The applicant is professionally qualified to conduct and complete the proposed activity;
(3) The applicant has adequate financial resources available to conduct and complete the proposed activity;
(4) The duration of the proposed activity is no longer than necessary to achieve its stated purpose;
(5) The methods and procedures proposed by the applicant are appropriate to achieve the goals of the proposed activity, especially in relation to the potential effects of the proposed activity on Sanctuary resources and qualities;
(6) The proposed activity will be conducted in a manner compatible with the primary objective of protection of Sanctuary resources and qualities, considering the extent to which the conduct of the activity may diminish or enhance Sanctuary resources and qualities, any potential indirect, secondary, or cumulative effects of the activity, and the duration of such effects;
(7) The proposed activity will be conducted in a manner compatible with the value of the Sanctuary as a source of recreation and as a source of educational and scientific information, considering the extent to which the conduct of the activity may result in conflicts between different users of the sanctuary and the duration of such effects;
(8) It is necessary to conduct the proposed activity within the Sanctuary;
(9) The reasonably expected end value of the proposed activity furthers Sanctuary goals and purposes and outweighs any potential adverse effects on Sanctuary resources and qualities from the conduct of the activity; and

(10) Any other matters the Director deems appropriate do not make the issuance of a permit for the proposed activity inappropriate.~~In considering whether to grant a permit the Director shall evaluate such matters as:~~

~~(1) The general professional, and financial responsibility of the applicant;~~

~~(2) The appropriateness of the methods envisioned to the purpose(s) of the activity;~~

(3) 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;

~~(4) The end value of the activity and~~

~~(5) Such other matters as may be deemed appropriate.~~

(d) Applications.

(1) Applications for permits should be addressed to the Director, Office of National Marine Sanctuaries; ATTN: Manager, Channel Islands National Marine Sanctuary, 113 Harbor Way, Santa Barbara, CA 93109.

(2) In addition to the information listed in 922.48(b), all applications must include information the Director needs to make the findings in paragraphs (b) and (c) of this section.

(e) In addition to any other terms and conditions that the Director deems appropriate, a permit issued pursuant to this section must require that the permittee agree to hold the United States harmless against any claims arising out of the conduct of the permitted activities.

The regulatory changes proposed above slightly augment the list of activities for which the Director may issue a permit, and specify which Sanctuary prohibitions permits may be applied to. While the existing Sanctuary regulations authorize the Director to issue permits for research, education, and salvage activities, the revised permit regulations add to this list activities that "will assist in managing the Sanctuary." This addition provides a mechanism by which the Director may issue permits for certain otherwise (without a permit) prohibited activities that will assist Sanctuary management. In addition, the revised permit regulations divide "salvage or recovery operations" into two activities for which the Director may issue a permit: those that further salvage or recovery operations in connection with an abandoned shipwreck in the Sanctuary title to which is held by the State of California; and those that further salvage or recovery operations in or near the Sanctuary in connection with a recent air or marine casualty. The modified permit regulations also specify that the Director may only issue permits for those activities that would otherwise (without a permit) violate the prohibitions proposed to be provided in 15 CFR 922.72(a)(3) through (10) and (a)(13), along with the prohibitions at 922.73: discharging and depositing; altering the submerged lands; abandoning (structures, material or other matter on the submerged lands); nearshore operation of vessels; disturbing a seabird or marine mammal by aircraft overflight below 1000 feet within 1 nmi of the Islands; moving, removing, injuring or possessing, or attempting to move, remove, injure or possess a Sanctuary historical resource; taking any marine mammal, sea turtle or seabird within or above the Sanctuary; possessing within the Sanctuary (regardless of where taken from, moved, or removed from) any marine mammal, sea turtle, or seabird; operating a motorized personal watercraft within waters of the Channel Islands National Park; and the marine reserves and marine conservation area regulations.

Another proposed modification to the permit regulations strengthens, based on the decades of permitting experience the NMSP now has, and augments the requirement that the Director consider certain criteria when evaluating permit applications. Whereas the existing regulation simply indicates that the Director shall evaluate certain matters in deciding whether to grant a permit, the revised regulation would state that

the Director may not issue a permit unless the Director makes the findings listed under part (c) above. These findings make express several concepts not explicitly included as review criteria in the existing permit regulations: the proposed activity will have at most short term and negligible adverse effects on Sanctuary resources and qualities; the duration of the proposed activity is no longer than necessary to achieve its stated purpose; and it is necessary to conduct the proposed activity within the Sanctuary. The required findings also include modifications of several concepts that serve as review criteria in the existing regulation. Whereas the existing regulation simply requires the Director to evaluate the general professional and financial responsibility of the applicant, the revised review criteria clarify that the Director must find that the applicant is professionally qualified to conduct and complete the proposed activity; and that the applicant has adequate financial resources available to conduct and complete the proposed activity. In addition to several minor changes to the existing review criteria regarding the appropriateness of the methods proposed to conduct the activity, the revised criteria include a new clause emphasizing the consideration of potential indirect, secondary and cumulative effects of the proposed activity on Sanctuary resources and qualities. In addition to minor modifications to the existing review criteria regarding whether permitted activities may diminish or enhance the value of the Sanctuary as a source of recreation, or as a source of educational or scientific information, consideration of the extent to which the conduct of the activity may result in conflicts between different users of the Sanctuary, and the duration of such effects, has been added. Finally, in addition to considering the end value of the proposed activity, the modified regulation requires that the Director find that the reasonably expected end value of the proposed activity furthers Sanctuary goals and purposes and outweighs any potential adverse effects on Sanctuary resources and qualities from the conduct of the activity.

The existing permit regulations indicate that the Director must obtain certain information about applicants and their proposed activities in order to evaluate permit applications, but do not expressly indicate to prospective permit applicants what type of information they are required to include in their application. To clarify what information the permit applicant must provide the revised permit regulations would indicate that in addition to the information listed in 15 CFR 922.48(b), all permit applications must include information the Director needs to make the required findings described above.

The revised permit regulations would also further refine current requirements and procedures from general National Marine Sanctuary Program regulations (15 CFR 922.48(a) and (c)). The proposed modifications would also clarify existing requirements for permit applications found in the Office of Management and Budget approved applicant guidelines (OMB Control Number 0648-0141).

The proposed modifications to the permit regulations (see (e) above) would expressly require that in addition to any other terms and conditions that the Director deems appropriate, the permittee agree to hold the United States harmless against any claims arising out of the permitted activities.

The overall intent of the revised permit regulations is: to clarify, standardize, and make express the permit requirements and procedures, rendering them easier for permit applicants to comply with and for the Director and Sanctuary staff to implement; to ensure that permitted projects are appropriate for the Sanctuary; and to provide a mechanism for issuing permits for activities that may further Sanctuary management but would otherwise be prohibited. In summary, the revised permit regulations: augment and clarify the list of activities for which the Director may issue a permit; clarify the list of prohibitions the Director may permit otherwise violations of; clarify the procedures, for submitting, evaluating, issuing, utilizing, reviewing, and renewing Sanctuary permits; and, based on the decades of permitting experience the NMSP now has, and make express the comprehensive set of criteria to be used by the Director when evaluating and reviewing permit applications.

2.1.17 CINMS Terms of Designation Changes

The CINMS terms of designation were originally set in 1980 upon establishment of the Sanctuary, and per the NMSA (16 U.S.C. 1434(a)(4)) describe the geographic area proposed to be included within the Sanctuary, the characteristics of the area that give it conservation, recreational, ecological, historical, research, educational, or esthetic value, and the types of activities that will be subject to regulation by the Secretary to protect those characteristics. This information is contained within the CINMS terms of designation, which are composed of six articles: Article I, Effect of Designation; Article II, Description of the Area; Article III, Characteristics of the Area That Give it Particular Value; Article IV, Scope of Regulation; Article V, Relation to Other Regulatory Programs; and, Article VI, Alterations to this Designation. The NMSP is proposing several revisions to the terms of designation, which include changes to the description of the area, an updated and more accurate description of characteristics that give the Sanctuary particular value, an updated explanation of the relation to other regulatory programs, and some substantive changes to the Sanctuary's scope of regulations.

Several revisions are proposed for Article I, Effect of Designation. Among these are minor revisions to the description of the Sanctuary's authorization to issue regulations and the list of activities subject to Sanctuary regulation. In addition, a preamble to the terms of designation declaring the Sanctuary's designation has been replaced with information about the 1980 designation.

Proposed revisions to Article II of the terms of designation, the Description of the Area, include specifying that submerged lands are part of the Sanctuary. At the time the Sanctuary was designated in 1980, Title III of the Marine Protection, Research, and Sanctuaries Act (also now known as the NMSA) characterized national marine sanctuaries as consisting of coastal and ocean waters, but did not expressly mention submerged lands there under. NOAA has consistently interpreted its authority under the NMSA as extending to submerged lands, and amendments to the NMSA in 1984 (Pub. L. 98-498) clarified that submerged lands may be designated by the Secretary of Commerce as part of a national marine sanctuary (16 U.S.C. 1432(3)). Therefore, consistent with the NMSA, the Sanctuary is proposing to include submerged lands in the description of the Sanctuary area and boundary, and to replace the term "seabed" with "submerged lands of the Sanctuary" throughout the terms of designation. In addition, proposed revisions include clarification that the landward boundary of the Sanctuary extends to the Mean High Water Line.

Proposed revisions to Article III of the terms of designation, the Characteristics of the Area That Give it Particular Value, are based on knowledge of Sanctuary resources and qualities gained since the original 1980 designation. This article has been augmented by a significant amount of new text, the intent of which is to provide an up to date, comprehensive yet succinct description of the Sanctuary's physical oceanography, habitats, species, cultural significance, and human use values (including recreational, commercial, scientific and educational values).

A number of the regulatory revisions included in this Proposed Action, as well as in Alternative 1, may not be implemented without broadening the Sanctuary's scope of regulations, the portion of the Sanctuary's terms of designation (Article IV) that describes in detail what the NMSP has the authority to regulate regarding the Sanctuary. Substantive proposed changes to the Sanctuary's Scope of Regulation include adding the following to Section 1 (Activities Subject to Regulation):

- Exploring for, developing, or producing minerals within the Sanctuary (see Prohibition 2);
- Discharging or depositing from beyond the boundary of the Sanctuary (see Prohibition 3);

- Placing or abandoning any structure, material, or other matter on or in the submerged lands of the Sanctuary (see Prohibition 5);

- Taking any marine mammal, sea turtle or seabird in or above the Sanctuary (see Prohibition 9);

- Possessing within the Sanctuary (regardless of where taken from, moved, or removed from) any marine mammal, sea turtle or seabird (see Prohibition 10);

- Marking, defacing, damaging, moving, removing, or tampering with any sign, notice or placard, whether temporary or permanent, or any monument, stake, post, or other boundary marker related to the Sanctuary (see Prohibition 11); and

- Introducing or otherwise releasing an introduced species from within or into the Sanctuary (see Prohibition 12).

Substantive proposed changes to the Sanctuary's list of activities subject to regulation also include revising the following within Section 1 (Activities Subject to Regulation):

- Regarding Sanctuary historical resources, changing the activity description that reads "removing or otherwise deliberately harming cultural or historical resources" to "Moving, removing, injuring, possessing or attempting to move, remove, injure, or possess a Sanctuary historical resource" (see Prohibition 8); and

- Regarding altering the seabed, changing the activity description from "Dredging or alteration of, or construction on, the seabed" to "Drilling into, dredging, or otherwise altering the submerged lands of the Sanctuary; or constructing, placing, or abandoning any structure, material, or other matter on or in the submerged lands of the Sanctuary."

Article IV, Section 2 (Consistency with International Law) is proposed to be revised with language taken directly from sec. 305(a) of the NMSA, which deals with application of regulations. Also, several clarifications are proposed to Article IV, Section 3 (Emergency Regulations). These changes provide greater clarity to the applicability of Sanctuary emergency regulations.

Article V, Relation to Other Regulatory Programs, is currently made up of three sections: Fishing, Defense Activities, and Other Programs. Proposed revisions to Article 5 are limited to the third section and include changing its title from "Other Programs" to "Effect on Leases, Permits, Licenses and Rights." Additional proposed revisions are intended to provide clarity and specificity regarding the effects of Sanctuary designation on valid leases, permits, licenses and other authorizations in existence as of the date of Sanctuary designation. The proposed action presented and analyzed herein *does not* propose changes to the "Fishing" and "Defense Activities" sections of Article V.

Article VI, Alterations to This Designation, is proposed to be updated to reflect the NMSA as amended.

The proposed revisions to the Sanctuary's terms of designation provide updated and more accurate descriptions of Sanctuary characteristics, would better enable CINMS to address new and emerging resource management issues, and are necessary in order to ensure the protection and management of the conservation, ecological, recreational, scientific, educational, historical, cultural, archeological, and esthetic resources and qualities of the Sanctuary.

2.2 ALTERNATIVE 1

The regulations under Alternative 1 would be identical to those described for the Proposed Action with the exception of slightly greater resource protection for the following regulations:

2.2.1 Prohibition 3 (Discharging and Depositing)

Prohibition 3 (Discharging or Depositing), would be modified to exclude any vessel of 300 gross registered tons or more from discharging treated sewage within the CINMS. For these larger vessels, this slightly more protective regulation would remove the exception from prohibition for marine sanitation device (MSD) discharge. The purpose would be to prevent the greater quantities of waste associated with larger vessels from being discharged into the Sanctuary. In addition, by prohibiting such treated waste discharges, the intent would be also to reduce the chance of an accident or error occurring that could result in the release of untreated sewage, thereby providing greater protection to the Sanctuary's water quality, helping to ensure the continued health and function of the ecosystem, and preventing unsightly discharges that could diminish the enjoyment of Sanctuary waters by other users.

This prohibition would augment existing protections afforded by other laws and regulations. The Federal Water Pollution Control Act, as amended, (33 U.S.C. 1251 *et seq.*) requires vessels with installed toilet facilities and operating on the navigable waters of the United States to contain operable marine sanitation devices certified as meeting standards and regulations promulgated under section 312 of that act. In addition, as of January 1, 2005 California Assembly Bill (AB) 2672 banned cruise ships from dumping sewage from toilets within three miles of shore in California waters, which includes the first three miles from Island shores of Sanctuary waters. Finally, California AB 2093 prohibits large passenger vessels of 300 gross registered tons or more from discharging "graywater" in state waters. Graywater in this case is defined as drainage from dishwashers, showers, laundry, bath and washbasins. AB 2093 also establishes specific reporting requirements for releases of graywater in state waters of the four national marine sanctuaries in offshore from California, including CINMS. Collectively these other laws require operable marine sanitation devices for vessels with toilets, and prohibit large passenger vessels from discharging graywater (as defined above) and sewage from toilets while in state waters. However, no existing law or regulation affords special protection for the unique resources and qualities of the Channel Islands National Marine Sanctuary with regard to: sewage discharge by cruise ships within federal waters of the Sanctuary, and sewage discharge by other (non-cruise ship) large vessels in state or federal waters of the Sanctuary.

2.2.2 Prohibition 6 (Nearshore Operation of Vessels)

Prohibition 6 (Nearshore Operation of Vessels), would be modified to exclude any vessel of 150 gross registered tons (GRT) or more (vs. 300) from operating within 1 nmi of the shore in the Sanctuary. This would decrease the proposed vessel size limit from 300 to 150 GRT, thus potentially applying to a greater number of vessels and, as such, further reducing the risk of vessel groundings or collisions in sensitive nearshore areas. However, NOAA is not aware of more than a few vessels between 150 to 299 GRT that occasionally visit the Sanctuary area within one nmi of the islands. NOAA is also not aware of fishing vessels greater than 150 GRT using Sanctuary waters, including within one nmi of the Islands, nor aware of any emerging fisheries trends suggesting that vessels of this size are planning to use Sanctuary waters. Using Automated Identification System (AIS) data, which will soon be available for the entire Sanctuary, NOAA plans to enhance vessel traffic monitoring in the nearshore area, and should be able to detect if the number of vessels between 150 to 299 GRT increases over time.

2.2.3 Prohibition 15 (Lightering)

This new regulation would prohibit lightering in the Sanctuary (see exceptions under an emergency below), and, as such, help reduce potentially harmful spills within the Sanctuary Per the program-wide regulations, "lightering" means the at-sea transfer of petroleum-based products, materials, or other matter from one vessel to another. The intent of the prohibition is to protect Sanctuary resources and qualities from the adverse effects of spillage that may occur during non-emergency lightering operations.

Additional cross-cutting exceptions would apply to this regulation. These exceptions are presented below, using added text (underlined) and deleted text (strike-through). Military activity exemptions are discussed separately at 2.1.15.

- Except for an activity necessary to respond to an emergency threatening life, property, or the environment.

- Except for an activity necessary for valid law enforcement purposes in the Sanctuary.

Recurring causes of spills that appear to be directly related to lightering include valve failures, tank overflows, and hose ruptures. Recent United States Coast Guard (USCG) safety data for lightering (from 1984 to 1996) indicate that few spills occurred during lightering on the United States coast, and that, where spills did occur, the average volume was only 26 barrels (1,095 gallons) (NRC 1998). From 1993 to 1997, no spills were reported on the east or west coasts of the United States, and only seven spills (accounting for less than 0.003 percent of the total volume lightered) were reported in the Gulf of Mexico.

Large scale vessel lightering does not currently occur in the Sanctuary, and NOAA does not believe it is likely to become a common practice given the Sanctuary's geographic location (*i.e.*, its distance from major ports), the Area to Be Avoided that advises large vessels to avoid the majority of the Sanctuary (excluding the TSS), and given the established traffic patterns within the Sanctuary (*e.g.*, large vessels are typically transiting the Sanctuary to use the TSS). NOAA understands that the occasional practice of sharing fuel between smaller boats (also a form of lightering) may occur, and that this practice may help prevent other possible problems such as vessel groundings. Existing Sanctuary prohibitions against discharges would be applicable to spills associated with small-boat to small-boat fuel transfers.

2.2.4 Terms of Designation Changes

As with the Proposed Action, Alternative 1 would require that the Sanctuary's terms of designation be modified in the same manner as summarized in section 2.1.17 above. One additional difference would be adding "lightering" as an activity subject to Sanctuary regulation under the scope of regulations.

2.3 NO-ACTION ALTERNATIVE

The No-Action Alternative would consist of no updates or other changes to any of the existing Sanctuary regulations, and no changes to the Sanctuary's terms of designation. All existing CINMS-specific regulations would remain as they are currently written and no new regulations would be added. This alternative would not provide for Sanctuary regulation of certain current or possible future activities that pose a threat to Sanctuary resources. In addition, with the No-Action Alternative, some outdated information would remain in place for CINMS regulations (*e.g.*, technical description of the boundary, obsolete oil spill cleanup equipment requirements). Under a No-Action Alternative scenario the Sanctuary would attempt to address new or emerging resource protection issues by continuing to use status-quo non-regulatory approaches. Those status quo non-regulatory approaches are described here.

2.3.1 Prohibition 1 (Oil and Gas)

The status quo alternative would be to continue to rely on language that is outdated. The language provides for outdated cleanup equipment standards, and as such, is inappropriate given current technologies and the terms of existing oil spill contingency plans.

2.3.2 Prohibition 2 (Mineral Activities)

The status quo alternative to the proposed prohibition on exploring for, developing, or producing minerals within the Sanctuary, except producing by-products incidental to authorized hydrocarbon production, would be to rely on other existing Sanctuary regulations to provide some level of protection against the potential damaging environmental effects of mining activities. The existing Sanctuary regulation on seabed protection within the first 2 nmi from the Islands, and possibly the Sanctuary's existing regulation prohibiting discharge and deposit of materials and matter, might serve as a limited deterrent to mining operations being conducted within the CINMS. However, such regulation would be indirect and leave the possibility that mining operations might be permissible in a large portion of the Sanctuary (*i.e.*, beyond 2 nmi from the Islands).

2.3.3 Prohibition 3 (Discharging or Depositing)

The status quo alternative to the proposed revision of the Sanctuary's discharge regulation that would clarify that discharges allowed from marine sanitation devices (MSDs) apply only to Type I and Type II MSDs, would be to rely on increased boater outreach and education efforts. As written, the existing Sanctuary regulation on discharge is intended to prohibit the release of raw sewage from vessels by requiring treatment from an MSD before discharge. However, the wording is not optimal because the specific type of MSD is not listed, and a Type III MSD does not actually provide any treatment to waste. Consequently, the no-action alternative would rely on status quo approaches to educational and outreach efforts explaining to boaters that, consistent with the original intent of the existing regulation, dumping of raw sewage within the Sanctuary is not permissible. Such ongoing education efforts would likely also involve helping boaters to understand where waste pumpout stations are located, and that discharge from a Type III MSD beyond the 6 nmi outer Sanctuary boundary is not a violation of Sanctuary regulations. Consultation and assistance would also be sought from Sanctuary enforcement partners with the U.S. Coast Guard, National Park Service, California Department of Fish and Game, and the NOAA Office for Law Enforcement. These types of status quo education, outreach and agency coordination efforts would, however, also take place if the revised regulation were adopted to help raise awareness of and compliance with the discharge regulation. However, maintaining the regulation as it is currently written allows for potential confusion with some boaters not understanding the intent of the existing Sanctuary regulation and as a result engaging in raw sewage discharge into Sanctuary waters.

With respect to the exception for discharging or depositing fish, fish parts, or chumming materials (bait) that would apply only to lawful fishing activities within the Sanctuary, NOAA would be able to only employ existing education and consultative measures to promote voluntary compliance with the desired prohibition. With this non-regulatory approach, Sanctuary staff would use existing educational tools and take awareness building measures to encourage Sanctuary users to refrain from chumming Sanctuary waters for recreational or other purposes not associated with lawful fishing practices, and to not dump fish wastes from lawful fishing activity outside the Sanctuary. Although such action would not be illegal under the regulations, efforts to educate boaters on the potential negative impacts of such an activity might help reduce the possibility of such practices taking place. Overall, the status quo alternative would leave the Sanctuary more vulnerable to a possible increase in chumming practices for non-fishing purposes and to fish waste dumping because such an activity would not be prohibited and, as such, there would be no legal deterrent against it.

The status quo alternative to the proposed revision of the Sanctuary's discharge regulation that would remove an exception for discharging or depositing meals on board vessels, would be to retain the existing exception and work through existing education and outreach measures to promote voluntary refraining from discharging meals on board vessels. Under this alternative, Sanctuary staff would use educational tools and take awareness-building measures to encourage Sanctuary boaters to refrain from discharging food scraps into Sanctuary waters and to apprise them of Act to Prevent Pollution from Ships requirements. Although such discharges would not violate Sanctuary regulations under this alternative, efforts to explain to boaters the potential negative impacts of depositing food into the marine environment could help reduce the possibility of such practices taking place within the Sanctuary. Overall, this alternative would leave the Sanctuary more vulnerable to the effects of food waste disposal practices because such an activity would not be specifically prohibited. In addition, this no-action alternative would leave in place the confusing nature of the existing Sanctuary discharge regulation, which provides an exception for the deposit of meals on board vessels within the Sanctuary despite the fact that the Act to Prevent Pollution from Ships (see 33 CFR part 151) prohibits such discharges within 0 to 3 nmi from shore, and permits the activity from 3 to 12 nmi from shore only if food waste has been ground to less than 1 inch.

The status quo alternative to the proposed revision of the Sanctuary's discharge/deposit regulation that would prohibit discharges and deposits of any material or other matter from beyond the boundary of the Sanctuary that subsequently enter the Sanctuary and injure a Sanctuary resource or quality would be to work through existing education and consultative measures to promote voluntary compliance with the intent of the prohibition. With this non-regulatory alternative, Sanctuary staff would use status quo educational tools to encourage various entities operating outside of Sanctuary boundaries to avoid the intentional or accidental release of material or other matter into the marine environment that could likely end up drifting into the Sanctuary and harming its resources and qualities. In addition, on a case by case basis, Sanctuary staff could consult with the proponents of new maritime-related projects that hold the potential to discharge, spill or otherwise release potentially harmful matter into waters near the Sanctuary, and request that such risks be reduced through appropriate project design or implementation measures. Similarly, this type of status quo consultation and commenting could be directed to other agencies that serve as authorizing agents for such projects. Overall, this non-regulatory educational and consultative approach may succeed in somewhat reducing threats to Sanctuary resources from discharges and deposits originating outside the Sanctuary boundary, but would lack a legal deterrent and civil penalty mechanism that the proposed regulatory prohibition would afford.

2.3.4 Prohibition 4 (Altering the Seabed)

A status quo, no new regulatory action approach to the proposed submerged lands protection regulation considered by the NMSP would be to address the risk of impacts to the Sanctuary from alteration of submerged lands through existing Sanctuary regulations and non-regulatory management activities. The existing Sanctuary regulation prohibiting altering the submerged lands of the Sanctuary within the first 2 nmi from Island shores (with exceptions for anchoring and commercial fishing bottom trawling) offers partial protection from seabed alteration. Other federal regulations prohibit unauthorized deposits upon, and placement of structures on, submerged lands with the intent of prohibiting potential obstructions to navigation. In addition to relying upon status quo regulations, the Sanctuary would use existing status quo education and outreach materials targeted at Sanctuary users to discourage them from conducting activities that may alter the submerged lands of the Sanctuary from the 2-6 nmi zone offshore from the Islands. The proposed regulation, however, is the only alternative that explicitly protects the submerged lands of the Sanctuary in its 2-6 nmi zone.

2.3.5 Prohibition 5 (Abandoning)

The status quo alternative to the proposed abandoning prohibition considered by the NMSP would be to attempt to address the risk of impacts to the Sanctuary from abandoned structures or materials through existing Sanctuary regulations and other existing non-regulatory management programs. The existing Sanctuary regulation prohibiting the discharge of any material or other matter, and the existing Sanctuary regulation prohibiting disturbance of the seabed within 2 nmi of the Islands, may offer partial protection from abandoned structures, material or other matter. It is unclear, however, that the Sanctuary's existing prohibition on discharge or deposit would apply to all possible abandonment situations. For example, research equipment left inserted into the sea floor of the Sanctuary may not clearly constitute a discharge or deposit. In addition, the Sanctuary's existing seabed protection regulation only provides protection from disturbance to the seabed in the portion of Sanctuary sea floor extending from the Islands to 2 nmi offshore. In addition, existing non-regulatory management strategies could be employed to attempt to address threats from abandonment of structures, material, or other matter on or in the submerged lands of the Sanctuary. Educational outreach could be conducted to explain to boaters the importance of recovering any grounded vessel, and of not scuttling a vessel within the Sanctuary. Similarly, scientists conducting research upon or in the Sanctuary's sea floor could be encouraged to remove all equipment after such projects are completed. Overall, this alternative would lack the additional specificity and clarity that the proposed regulation brings to the issue of abandoning material or other matter within the Sanctuary, and would also not provide the added deterrence from abandonment activities that the proposed regulation would provide with NMSA-authorized civil penalties of up to $130,000 per incident, per day.

2.3.6 Prohibition 6 (Nearshore Operation of Vessels)

The status quo alternative to the proposed revised nearshore vessel operation regulation would involve operating under the existing regulatory scenario. Existing Sanctuary regulations prohibit operating within 1 nmi of an Island any vessel engaged in the trade of carrying cargo, including, but not limited to, tankers and other bulk carriers and barges, or any vessel engaged in the trade of servicing offshore installations, except to transport persons or supplies to or from an Island. This regulation allows for the legal operation of all other types of vessels, regardless of their size, such as cruise ships, privately owned vessels, charter vessels, vessels owned by educational, research or restoration NGOs, and salvage vessels. The status quo regulation does not apply to fishing or kelp harvesting vessels. The NMSP could use status quo approaches to target vessels from the non-prohibited categories, and that fall within the 300 gross registered ton or larger size class, with educational messages aimed at informing them of the potential dangers and environmental harm that may be caused by their operation within 1 nmi of the Islands, and to request that they voluntarily anchor farther offshore and utilize smaller vessels to approach within 1 nmi of the Islands. The proposed modified prohibition is preferable since it more directly addresses the NMSP's concern that large vessels, regardless of their purpose, not approach and therefore endanger sensitive nearshore areas of the Sanctuary.

2.3.7 Prohibition 7 (Disturbing a Seabird or Marine Mammal by Aircraft Overflight)

The status quo alternative to the proposed revision of this regulation would lack an important parenthetical phrase emphasizing that exceptions to this regulation do not override the obligation to comply with proposed Prohibition 9 (taking a marine mammal, seabird, or sea turtle). Under the status quo, regulations would continue to prohibit disturbance of a seabird or marine mammal by flying a motorized aircraft at less than 1,000 feet over the waters within 1 nmi of any Island, except to engage in kelp bed surveys or to transport persons or supplies to or from an Island.

2.3.8 Prohibition 8 (Moving, Removing, Possessing, or Injuring a Sanctuary Historical Resource)

The status quo alternative to the proposed modified prohibition would involve operating under the existing regulatory scenario. With this no action alternative, educational and outreach activities could be conducted by Sanctuary staff to raise awareness about the detrimental impacts that can result not only from prohibited activities (*i.e.*, removing or damaging), but other types of unregulated handling as well, such as possession of or attempting to move a historical resource. These educational efforts could be partially successful in reducing the possibility of such potentially damaging actions from occurring. Overall, this non-regulatory alternative would lack the legal deterrence and civil penalty mechanism provided by the proposed prohibition with regard to Sanctuary historical resources.

2.3.9 Prohibition 9 (Taking a Marine Mammal, Sea Turtle, or Seabird) and Prohibition 10 (Possessing a Marine Mammal, Sea Turtle, or Seabird)

The status quo alternative to the proposed prohibitions would involve operating under the status quo regulatory scenario. No existing Sanctuary regulations prohibit the take or possession of marine mammals, sea turtles, or seabirds. However, unauthorized take is prohibited by the Marine Mammal Protection Act (16 U.S.C. 1361 *et seq.*), the Endangered Species Act (16 U.S.C. 1531 *et seq.*), the Migratory Bird Treaty Act (16 U.S.C. 703 *et seq.*), and regulations promulgated under these acts. Thus, unauthorized take or possession of such animals, to the extent those acts apply, would remain prohibited within the Sanctuary regardless of whether the Sanctuary's proposed prohibition is implemented. However, the status quo scenario does not afford Sanctuary protection for and civil penalty deterrence from take or possession of the abundant marine mammal and seabird populations found in the CINMS, nor special protection for sea turtles occasionally found within the Sanctuary. Added civil penalty deterrence cannot be accomplished without a regulatory amendment such as that proposed. As part of status quo operations, the NMSP would continue to consult with, and where appropriate, seek cooperating agency status under the National Environmental Policy Act, to discuss permit criteria and conditions with those agencies authorized to issue take permits under the aforementioned acts and regulations, as amended, promulgated thereunder. However, the NMSP would not have the authority to utilize its locally focused resources to enforce protection of marine mammals, sea turtles, and seabirds and would be required to rely on the enforcement efforts of non-locally focused agencies. The proposed modified prohibitions are preferred since they would authorize the NMSP to directly address take and possession of marine mammals, sea turtles, and seabirds of the CINMS, and since they would not add burden to the existing permit/authorization structure under the Marine Mammal Protection Act, Endangered Species Act, and Migratory Bird Treaty Act.

2.3.10 Prohibition 11 (Tampering with Signs)

The status quo alternative to the proposed Sanctuary regulation prohibiting tampering with signs would be to continue not to prohibit the following activities: marking, defacing, damaging, moving, removing, or tampering with any sign, notice, or placard, whether temporary or permanent, or any monument, stake, post or other boundary marker related to the Sanctuary. This would leave to chance the fate of such signs to acts of vandalism, theft or other damage. New signs or markers could be developed by the NMSP and Sanctuary staff could work with manufacturers to create products that are more resistant to demarcation or removal. Overall, this non-regulatory alternative would differ from the proposed new regulation in that it would lack the legal deterrence mechanism provided by the proposed prohibition.

2.3.11 Prohibition 12 (Releasing an Introduced Species)

The status quo alternative to the proposed prohibition on introduced species would be to continue to allow introduced species. No existing Sanctuary regulations prohibit introducing or otherwise releasing introduced species from within or into the Sanctuary. Other rules establish federal programs to help prevent introduced species introductions via ballast water, and spawning, incubating or cultivating transgenic and exotic species is prohibited in California marine waters (Fish and Game Code 15007). Since existing rules do not afford prohibitions against non-transgenic introduced species releases in state waters, and against any form of introduced species releases in federal waters, the NMSP could proceed in a status quo manner to assist in non-regulatory reactive efforts to try to remove introduced species in harbors along the adjacent mainland coast, and proactive efforts distributing educational materials to users to inform them about problems associated with introduced species and how they can help prevent the spread of introduced species along California, and in CINMS. However, regulatory authority and associated civil penalties would likely be the most effective deterrent against releases of introduced species into the Sanctuary.

2.3.12 Prohibition 13 (Operation of Motorized Personal Watercraft)

The status quo alternative to the proposed Sanctuary regulation prohibiting the operation of motorized personal watercraft within waters of the Channel Islands National Park would be to rely on the existing National Park Service prohibition of this activity currently applicable to the same marine area (36 CFR 3.9(a)). In addition, this alternative could involve educational efforts by Sanctuary staff to help riders of motorized personal watercraft learn about the National Park Service prohibition, and assist with enforcement of that prohibition by reporting any sightings of illegal personal watercraft operation to appropriate law enforcement personnel, such as rangers with the Channel Islands National Park. What this alternative would lack (that the proposed Sanctuary prohibition would provide) is a stronger legal deterrent afforded by civil penalties applicable to violations of Sanctuary regulations, as authorized by the NMSA.

2.3.13 Regulation on Department of Defense Activities

The status quo alternative to the proposed revised regulation on Department of Defense (DOD) activities would involve operating under the existing policy and procedures. Under the current DOD Sanctuary regulation, military activities that were described in the CINMS 1982 FEIS are exempt from the current Sanctuary regulations. However, the list of activities exempted no longer reflects current military activities in and around the Sanctuary, and as such the exemption is outdated from the standpoint of both the DOD and the CINMS. Further, what constitutes a new activity is not clear. In addition, a no action alternative would mean that the current DOD regulation would not be expressly consistent with the NMSA, which has been reauthorized several times since the existing DOD regulation went into effect (1982), *e.g.*, with regard to the requirements of prevention, mitigation, and restoration. For these reasons, the proposed revised regulation on DOD activities is preferred.

2.3.14 Regulation on Permit Procedures and Issuance Criteria

The status quo alternative to the proposed revised permit regulation would involve operating under existing procedures. Existing Sanctuary regulations authorize the Director of the NMSP to issue permits for research, education, and salvage activities. They also guide the Director to evaluate such matters as: the general 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.

These regulations do not provide a clear mechanism by which the Sanctuary may achieve its objective of issuing permits for activities that would further Sanctuary management, but otherwise be prohibited. These regulations also imply certain types of information the Director requires in order to evaluate permit applications, but do not expressly indicate to prospective permit applicants what type of information they will be required to submit. Nor, for example, are the current regulations always as explicit about the review criteria as might be desirable. While these and other details the NMSP would like to clarify could be included in the permit application instructions and the actual Sanctuary permit text, codifying such details in the regulations provides a clear set of guidelines that are legally binding for the NMSP and CINMS as the permit issuing bodies, and for permit applicants. As such the proposed modified permit regulation is preferable.

2.4 ALTERNATIVES CONSIDERED BUT DISMISSED

Addition of a prohibition on extractive bioprospecting for commercial purposes was considered but dismissed from further consideration. Biodiversity prospecting, or bioprospecting, is the activity of seeking a useful application, process, or product from nature. In many cases, bioprospecting is a search for useful organic compounds in microorganisms, plants, and fungi (NPS 2001). Bioprospecting in the ocean can provide products other than seafood, such as ornamental marine life, raw materials, and medicines. For example, through marine bioprospecting an extract (arabinosides) was collected from the sponge *Tethya crypta* that led to more than $50 million in annual sales of derived antiviral medicines (NMFS 2001; Norse 1993). The most common use of materials from marine bioprospecting is for the production of pharmaceuticals. Marine bioprospecting may lead to include sampling and can lead to extraction of a living marine resource for commercial purposes.

There is no known bioprospecting within the Sanctuary at this time. However, there are research projects funded by MMS in which the potential beneficial properties of marine life attached to the submerged structure of a sample of offshore oil platforms in the Santa Barbara Channel are being investigated.

Because removing marine life for bioprospecting may potentially lead to habitat and ecosystem alterations, prohibition of bioprospecting in the Sanctuary was considered. The implications of marine bioprospecting within the Sanctuary are not clearly understood. This provision was dismissed from further consideration for this management plan update.

Table 2.1-1. Regulatory Alternatives Considered for the CINMS Management Plan Update

No Action (Status Quo)	Proposed Action Underlined (new) and ~~strikethrough~~ (deleted) text show differences from No Action (Status Quo)	Alternative 1 (**bold** text is different from Proposed Action)
Sanctuary Boundary (15 CFR 922.70). The Channel Islands National Marine Sanctuary (Sanctuary) consists of an area of the waters off the coast of California of approximately 1,128 square nautical miles (nmi) adjacent to 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 (collectively the Islands) extending seaward to a distance of approximately six nmi. The boundary coordinates are listed in appendix A to this subpart.	**Sanctuary Boundary**. The Channel Islands National Marine Sanctuary (Sanctuary) consists of an area of ~~the water off the coast of California of~~ approximately 1,128 square nautical miles (nmi) of coastal and ocean waters, and the submerged lands there under, 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 ~~adjacent to~~ 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 (~~collectively~~ the Islands) ~~extending seaward to a distance of approximately six nmi~~. The seaward boundary coordinates are listed in the Appendix ~~A~~ to this subpart.	**Sanctuary Boundary**. Same as Proposed Action
1. Oil and Gas. Prohibited: Exploring for, developing, and producing hydrocarbons except pursuant to leases executed prior to March 30, 1981, and except the laying of pipeline, if the following oil spill contingency equipment is available at the site of such operations: (i) 1500 feet of open ocean containment boom and a boat capable of deploying the boom; **(ii) One oil skimming device capable of open ocean use; and** (iii) Fifteen bales of oil sorbent material, and subject to all prohibitions, restrictions and conditions imposed by applicable regulations, permits, licenses or other authorizations and consistency reviews including those issued by the Department of the Interior, the Coast Guard, the Corps of Engineers, the Environmental Protection Agency and under the California Coastal Management Program and its implementing regulations. Other Exceptions: • Except as may be necessary for the national defense • Except as may be necessary to respond to an emergency threatening life, property, or the environment • Except as may be permitted by the Director in accordance with 15 CFR secs. 922.48 and 922.72	**1. Oil and Gas**. Prohibited: Exploring for, developing, ~~and~~or producing hydrocarbons within the Sanctuary, except pursuant to leases executed prior to March 30, 1981, and except the laying of pipeline pursuant to exploring for, developing, or producing hydrocarbons, ~~if the following oil spill contingency equipment is available at the site of such operations:~~ ~~(i) 1500 feet of open ocean containment boom and a boat capable of deploying the boom;~~ ~~(ii) One oil skimming device capable of open ocean use; and~~ ~~(iii) Fifteen bales of oil sorbent material, and subject to all prohibitions, restrictions and conditions imposed by applicable regulations, permits, licenses or other authorizations and consistency reviews including those issued by the Department of the Interior, the Coast Guard, the Corps of Engineers, the Environmental Protection Agency and under the California Coastal Management Program and its implementing regulations~~. ~~Other Exceptions:~~ • ~~Except as may be necessary for the national defense~~ • ~~Except as may be necessary to respond to an emergency threatening life, property, or the environment,~~ • ~~Except as may be permitted by the Director in accordance with 15 CFR secs. 922.48 and 922.72~~	**1. Oil and Gas**. Same as Proposed Action
2. Mineral Activities. **No existing regulation**	**2. Mineral Activities.** Prohibited: Exploring for, developing, or producing minerals within the Sanctuary, except producing by-products incidental to hydrocarbon production allowed by paragraph (a)(1) of this section [see #1 above].	**2. Mineral Activities.** Same as Proposed Action

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Table 2.1-1. Regulatory Alternatives Considered for the CINMS Management Plan Update (Continued)

No Action (Status Quo)	**Proposed Action** Underlined (new) and ~~strikethrough~~ (deleted) text show differences from No Action (Status Quo)	**Alternative 1** (**bold** text is different from Proposed Action)
3. Discharging or Depositing. Prohibited: Discharging or depositing any material or other matter except: (i) Fish or fish parts and chumming materials (bait); (ii) Water (including cooling water) and other biodegradable effluents incidental to vessel use of the Sanctuary generated by: (A) Marine sanitation devices; (B) Routine vessel maintenance, *e.g.*, deck wash down; (C) Engine exhaust; or (D) Meals on board vessels; (iii) Effluents incidental to hydrocarbon exploration and exploitation activities allowed by paragraph (a)(1) of this section [see #1 above]. Other Exceptions: • Except as may be necessary for the national defense • Except as may be necessary to respond to an emergency threatening life, property, or the environment • Except as may be permitted by the Director in accordance with 15 CFR secs. 922.48 and 922.72	**3. Discharging or Depositing.** Prohibited: Discharging or depositing from within or into the Sanctuary any material or other matter except: (A)~~(i)~~ Fish, ~~or~~ fish parts, ~~and~~ or chumming materials (bait) used in or resulting from lawful fishing activity within the Sanctuary, provided that such discharge or deposit is during the conduct of lawful fishing activity within the Sanctuary; (B)~~(ii) Water (including cooling water) and other b~~Biodegradable effluent~~s~~ incidental to vessel use ~~of the Sanctuary~~and generated by~~:~~ ~~(A)~~an operable Type I or II marine sanitation device~~s~~ (U.S. Coast Guard classification) approved in accordance with section 312 of the Federal Water Pollution Control Act, as amended, (FWPCA), 33 U.S.C. 1321 *et seq*. from a vessel less than 300 gross registered tons (GRT) or oceangoing ships without sufficient holding tank capacity to hold sewage while within the Sanctuary. Vessel operators must lock all marine sanitation devices in a manner that prevents discharge of untreated sewage; (B)(C) ~~Routine vessel maintenance, *e.g.*,~~Biodegradable matter from: (1) Vessel deck wash down; (2) Vessel engine cooling water; (3) Graywater from a vessel less than 300 gross registered tons; (4) Graywater from an oceangoing ship without sufficient holding tank capacity to hold graywater while within the Sanctuary; ~~(C)~~(D) Vessel e~~E~~ngine or generator exhaust; ~~or~~ ~~(D) Meals on board vessels;~~ ~~(iii)~~ (E) Effluents routinely and necessarily discharged or deposited incidental to hydrocarbon exploration, development, or production ~~and exploitation activities~~ allowed by paragraph (a)(1) of this section [see #1 above]; (F) Discharges allowed under section 312(n) of the FWPCA; or (ii) Discharging or depositing from beyond the boundary of the Sanctuary any material or other matter that subsequently enters the Sanctuary and injures a Sanctuary resource or quality, except those listed in subparagraphs (a)(3)(i)(B) through (F) of this section and fish, fish parts, or chumming materials (bait) used in or resulting from lawful fishing activity beyond the boundary of the Sanctuary, provided that such discharge or deposit is during the conduct of lawful fishing activity there. Proposed definitions (at Sec. 922.71): • Oceangoing ship means a private, commercial, government, or military vessel of 300 gross registered tons or more, not including cruise ships. • Graywater means galley, bath, or shower water. • Cruise ship means a vessel with 250 or more passenger berths for hire. Other Exceptions: • Except ~~as may be permitted by the Director~~ in accordance with the scope, purpose, terms, and conditions of a National Marine Sanctuary permit issued pursuant to 15 CFR ~~secs.~~ 922.48 and 922.7~~2~~4. • Except ~~as may be~~ for an activity necessary to respond to an emergency threatening life, property, or the environment. • Except for an activity necessary for valid law enforcement purposes in the Sanctuary. • [See Department of Defense at the end of this table.]	**3. Discharging or Depositing.** Prohibited: Discharging or depositing from within or into the Sanctuary any material or other matter except: (A)~~(i)~~ Fish, ~~or~~ fish parts, ~~and~~ or chumming materials (bait) used in or resulting from lawful fishing activity within the Sanctuary, provided that such discharge or deposit is during the conduct of lawful fishing activity within the Sanctuary; (B)~~(ii) Water (including cooling water) and other b~~Biodegradable effluent~~s~~ incidental to vessel use ~~of the Sanctuary~~and generated by~~:~~ ~~(A)~~an operable Type I or II marine sanitation device~~s~~ (U.S. Coast Guard classification) approved in accordance with section 312 of the Federal Water Pollution Control Act, as amended, (FWPCA), 33 U.S.C. 1321 *et seq*. **excluding any vessel of 300 gross registered tons or more.** Vessel operators must lock all marine sanitation devices in a manner that prevents discharge of untreated sewage; (B)(C) ~~Routine vessel maintenance, *e.g.*,~~Biodegradable matter from vessel deck wash down, vessel engine cooling water, or graywater as defined by section 312 of the FWPCA; ~~(C)~~(D) Vessel e~~E~~ngine or generator exhaust; ~~or~~ ~~(D) Meals on board vessels;~~ ~~(iii)~~ (E) Effluents routinely and necessarily discharged or deposited incidental to hydrocarbon exploration, development, or production ~~and exploitation activities~~ allowed by paragraph (a)(1) of this section [see #1 above]; (F) Discharges allowed under section 312(n) of the FWPCA; or (ii) Discharging or depositing from beyond the boundary of the Sanctuary any material or other matter that subsequently enters the Sanctuary and injures a Sanctuary resource or quality, except those listed in subparagraphs (a)(3)(i)(B) through (F) of this section and fish, fish parts, or chumming materials (bait) used in or resulting from lawful fishing activity beyond the boundary of the Sanctuary, provided that such discharge or deposit is during the conduct of lawful fishing activity there. Other Exceptions: • Except ~~as may be permitted by the Director~~ in accordance with the scope, purpose, terms, and conditions of a National Marine Sanctuary permit issued pursuant to 15 CFR ~~secs.~~ 922.48 and 922.7~~2~~4. • Except ~~as may be~~ for an activity necessary to respond to an emergency threatening life, property, or the environment. • Except for an activity necessary for valid law enforcement purposes in the Sanctuary. • [See Department of Defense at the end of this table.]

Table 2.1-1. Regulatory Alternatives Considered for the CINMS Management Plan Update (Continued)

No Action (Status Quo)	Proposed Action Underlined (new) and ~~strikethrough~~ (deleted) text show differences from No Action (Status Quo)	Alternative 1 (**bold** text is different from Proposed Action)
4. Altering the Seabed. Prohibited: Except in connection with the laying of any pipeline as allowed by paragraph (a)(1) of this section, within 2 NM of any Island: (i) Constructing any structure other than a navigation aid, (ii) Drilling through the seabed, or (iii) Dredging or otherwise altering the seabed in any way, other than (A) To anchor vessels, or (B) To bottom trawl from a commercial fishing vessel. Other Exceptions: • Except as may be necessary for the national defense • Except as may be necessary to respond to an emergency threatening life, property, or the environment, • Except as may be permitted by the Director in accordance with 15 CFR secs. 922.48 and 922.72	**4. Altering the Submerged Lands.** Prohibited: ~~Except in connection with the laying of any pipeline as allowed by paragraph (a)(1) of this section, within 2 NM of any Island: (ii)~~Drilling into ~~through the seabed~~, ~~(iii) D~~dredging, or otherwise altering the ~~seabed~~ submerged lands of the Sanctuary ~~in any way, other than;~~ ~~(i)~~ or ~~C~~constructing or placing any structure ~~other than a navigation aid~~, material, or other matter on or in the submerged lands of the Sanctuary, except as incidental to and necessary to: ~~(A)~~(i) ~~To a~~Anchor a vessel~~s~~; (ii) Install an authorized navigational aid; ~~(B) (iii) To bottom trawl from a commercial fishing vessel~~Conduct lawful fishing activity; (iv) Lay pipeline pursuant to exploring for, developing, or producing hydrocarbons; or (v) Explore for, develop, or produce hydrocarbons as allowed by subparagraph (a)(1) of this section [see #1 above]. Other Exceptions: • Except ~~as may be permitted by the Director~~ in accordance with the scope, purpose, terms, and conditions of a National Marine Sanctuary permit issued pursuant to 15 CFR ~~secs.~~ 922.48 and 922.7~~2~~4. • Except ~~as may be~~ for an activity necessary to respond to an emergency threatening life, property, or the environment. • Except for an activity necessary for valid law enforcement purposes in the Sanctuary. • [See Department of Defense at the end of this table.]	**4. Altering the Submerged Lands.** Same as Proposed Action
5. Abandoning. **No existing regulation**	**5. Abandoning.** Prohibited: Abandoning any structure, material, or other matter on or in the submerged lands of the Sanctuary. Exceptions: • Except in accordance with the scope, purpose, terms, and conditions of a National Marine Sanctuary permit issued pursuant to 15 CFR 922.48 and 922.74. • Except for an activity necessary to respond to an emergency threatening life, property, or the environment. • Except for an activity necessary for valid law enforcement purposes in the Sanctuary. • [See Department of Defense at the end of this table.]	**5. Abandoning.** Same as Proposed Action

Table 2.1-1. Regulatory Alternatives Considered for the CINMS Management Plan Update (Continued)

No Action (Status Quo)	**Proposed Action** Underlined (new) and ~~strikethrough~~ (deleted) text show differences from No Action (Status Quo)	**Alternative 1** (**bold** text is different from Proposed Action)
6. Nearshore Operation of Vessels. Prohibited: Except to transport persons or supplies to or from an Island, operating within one NM of an Island any vessel engaged in the trade of carrying cargo, including, but not limited to, tankers and other bulk carriers and barges, or any vessel engaged in the trade of servicing offshore installations. In no event shall this section be construed to limit access for fishing (including kelp harvesting), recreational, or research vessels. Other Exceptions: • Except as may be necessary for the national defense • Except as may be necessary to respond to an emergency threatening life, property, or the environment, • Except as may be permitted by the Director in accordance with 15 CFR secs. 922.48 and 922.72	**6. Nearshore Operation of Vessels.** Prohibited: Except to transport persons or supplies to or from any Island, operating within one ~~NM~~nmi of any Island any vessel engaged in the trade of carrying cargo, including, but not limited to, tankers and other bulk carriers and barges, ~~or~~ any vessel engaged in the trade of servicing offshore installations, or any vessel of three hundred gross registered tons or more, except~~. In no event shall this section be construed to limit access for~~ fishing ~~(including~~ or kelp harvesting~~), recreational, or research~~ vessels. Other Exceptions: • Except ~~as may be permitted by the Director~~ in accordance with the scope, purpose, terms, and conditions of a National Marine Sanctuary permit issued pursuant to 15 CFR ~~secs.~~ 922.48 and 922.72~~2~~4. • Except ~~as may be~~ for an activity necessary to respond to an emergency threatening life, property, or the environment. • Except for an activity necessary for valid law enforcement purposes in the Sanctuary. • [See Department of Defense at the end of this table.]	**6. Nearshore Operation of Vessels.** Prohibited: Except to transport persons or supplies to or from any Island, operating within one ~~NM~~nmi of any Island any vessel engaged in the trade of carrying cargo, including, but not limited to, tankers and other bulk carriers and barges, ~~or~~ any vessel engaged in the trade of servicing offshore installations, or any vessel of **one hundred fifty** gross registered tons or more, except~~. In no event shall this section be construed to limit access for~~ fishing ~~(including~~ or kelp harvesting~~), recreational, or research~~ vessels. Other Exceptions: • Except ~~as may be permitted by the Director~~ in accordance with the scope, purpose, terms, and conditions of a National Marine Sanctuary permit issued pursuant to 15 CFR ~~secs.~~ 922.48 and 922.72~~2~~4. • Except ~~as may be~~ for an activity necessary to respond to an emergency threatening life, property, or the environment. • Except for an activity necessary for valid law enforcement purposes in the Sanctuary. • [See Department of Defense at the end of this table.]
7. Disturbing a Seabird or Marine Mammal by Aircraft. Prohibited: Disturbing seabirds or marine mammals by flying motorized aircraft at less than 1000 feet over the waters within one NM of any Island except: (i) For enforcement purposes; (ii) To engage in kelp bed surveys; or (iii) To transport persons or supplies to or from an Island. Other Exceptions: • Except as may be necessary for the national defense • Except as may be necessary to respond to an emergency threatening life, property, or the environment • Except as may be permitted by the Director in accordance with 15 CFR secs. 922.48 and 922.72	**7. Disturbing a Seabird or Marine Mammal by Aircraft.** Prohibited: Disturbing a seabird~~s~~ or marine mammal~~s~~ by flying a motorized aircraft at less than 1000 feet over the waters within one ~~NM~~nmi of any Island, except (if allowed under subparagraph (a)(9) of this section [see #9 below): ~~(i) For enforcement purposes;~~ ~~(ii)~~(i) to engage in kelp bed surveys; or ~~(iii)~~(ii) to transport persons or supplies to or from an Island. Other Exceptions: • Except ~~as may be permitted by the Director~~ in accordance with the scope, purpose, terms, and conditions of a National Marine Sanctuary permit issued pursuant to 15 CFR ~~secs.~~ 922.48 and 922.72~~2~~4. • Except ~~as may be~~ for an activity necessary to respond to an emergency threatening life, property, or the environment. • Except for an activity necessary for valid law enforcement purposes in the Sanctuary. • [See Department of Defense at the end of this table.]	**7. Disturbing a Seabird or Marine Mammal by Aircraft.** Same as Proposed Action

Table 2.1-1, Page 4 of 9

Table 2.1-1. Regulatory Alternatives Considered for the CINMS Management Plan Update (Continued)

No Action (Status Quo)	Proposed Action Underlined (new) and ~~strikethrough~~ (deleted) text show differences from No Action (Status Quo)	Alternative 1 (**bold** text is different from Proposed Action)
8. Moving, Removing, or Injuring a Sanctuary Historical Resource. Prohibited: Removing or damaging any historical or cultural resource. Other Exceptions: • Except as may be necessary for the national defense • Except as may be necessary to respond to an emergency threatening life, property, or the environment, • Except as may be permitted by the Director in accordance with 15 CFR secs. 922.48 and 922.72	**8. Moving, Removing, or Injuring a Sanctuary Historical Resource.** Prohibited: Moving, ~~R~~removing, injuring, or possessing, or attempting to move, remove, injure, or possess ~~or damaging any~~ a Sanctuary historical ~~or cultural~~ resource. Exceptions: • Except ~~as may be permitted by the Director~~ in accordance with the scope, purpose, terms, and conditions of a National Marine Sanctuary permit issued pursuant to 15 CFR ~~secs.~~ 922.48 and 922.7~~2~~4. • Except ~~as may be~~ for an activity necessary to respond to an emergency threatening life, property, or the environment. • Except for an activity necessary for valid law enforcement purposes in the Sanctuary. • [See Department of Defense at the end of this table.]	**8. Moving, Removing, or Injuring a Sanctuary Historical Resource.** Same as Proposed Action
9. Taking a Marine Mammal, Sea Turtle, or Seabird. **No existing regulation**	**9. Taking a Marine Mammal, Sea Turtle, or Seabird.** Prohibited: Taking any marine mammal, sea turtle, or seabird within or above the Sanctuary, except as authorized by the Marine Mammal Protection Act, as amended, (MMPA), 16 U.S.C. 1361 *et seq.*, Endangered Species Act, as amended, (ESA), 16 U.S.C. 1531 *et seq.*, Migratory Bird Treaty Act, as amended, (MBTA), 16 U.S.C. 703 *et seq.*, or any regulation, as amended, promulgated under the MMPA, ESA, or MBTA. Other Exceptions: • Except in accordance with the scope, purpose, terms, and conditions of a National Marine Sanctuary permit issued pursuant to 15 CFR 922.48 and 922.74. • Except for an activity necessary to respond to an emergency threatening life, property, or the environment. • Except for an activity necessary for valid law enforcement purposes in the Sanctuary. • [See Department of Defense at the end of this table.]	**9. Taking a Marine Mammal, Sea Turtle, or Seabird.** Same as Proposed Action
10. Possessing a Marine Mammal, Sea Turtle, or Seabird. **No existing regulation**	**10. Possessing a Marine Mammal, Sea Turtle, or Seabird.** Prohibited: Possessing within the Sanctuary (regardless of where taken from, moved, or removed from) any marine mammal, sea turtle, or seabird, except as authorized by the MMPA, ESA, MBTA, or any regulation, as amended, promulgated under the MMPA, ESA, or MBTA. Other Exceptions: • Except in accordance with the scope, purpose, terms, and conditions of a National Marine Sanctuary permit issued pursuant to 15 CFR 922.48 and 922.74. • Except for an activity necessary to respond to an emergency threatening life, property, or the environment. • Except for an activity necessary for valid law enforcement purposes in the Sanctuary. • [See Department of Defense at the end of this table.]	**10. Possessing a Marine Mammal, Sea Turtle, or Seabird** Same as Proposed Action

Table 2.1-1, Page 5 of 9

Table 2.1-1. Regulatory Alternatives Considered for the CINMS Management Plan Update (Continued)

No Action (Status Quo)	**Proposed Action** Underlined (new) and ~~strikethrough~~ (deleted) text show differences from No Action (Status Quo)	**Alternative 1** (**bold** text is different from Proposed Action)
11. Tampering with Signs **No existing regulation**	**11. Tampering with Signs** Prohibited: Marking, defacing, damaging, moving, removing, or tampering with any sign, notice, or placard, whether temporary or permanent, or any monument, stake, post, or other boundary marker related to the Sanctuary. Exceptions: • Except for an activity necessary to respond to an emergency threatening life, property, or the environment. • Except for an activity necessary for valid law enforcement purposes in the Sanctuary. • [See Department of Defense at the end of this table.]	**11. Tampering with Signs** Same as Proposed Action
12. Releasing an Introduced Species **No existing regulation**	**12. Releasing an Introduced Species** Prohibited: Introducing or otherwise releasing from within or into the Sanctuary an introduced species, except striped bass (*Morone saxatilis*) released during catch and release fishing activity. Exceptions: • Except in accordance with the scope, purpose, terms, and conditions of a National Marine Sanctuary permit issued pursuant to 15 CFR 922.48 and 922.74. • [See Department of Defense at the end of this table.] Proposed definition (at Sec. 922.71): Introduced species means (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.	**12. Releasing an Introduced Species** Same as Proposed Action
13. Operation of Motorized Personal Watercraft **No existing regulation**	**13. Operation of Motorized Personal Watercraft** Prohibited: Operating a motorized personal watercraft within waters of the Channel Islands National Park, established by 16 U.S.C. 410(ff). Proposed definition (at Sec, 922.71): Motorized personal watercraft means a vessel, usually less than 16 feet in length, which uses an inboard, internal combustion engine powering a water jet pump as its primary source of propulsion. The vessel is intended to be operated by a person or persons sitting, standing or kneeling on the vessel, rather than within the confines of the hull. The length is measured from end to end over the deck excluding sheer, meaning a straight line measurement of the overall length from the foremost part of the vessel to the aftermost part of the vessel, measured parallel to the centerline. Bow sprits, bumpkins, rudders, outboard motor brackets, and similar fittings or attachments, are not included in the measurement. Length is stated in feet and inches. Exceptions: • Except in accordance with the scope, purpose, terms, and conditions of a National Marine Sanctuary permit issued pursuant to 15 CFR 922.48 and 922.74. • Except for an activity necessary to respond to an emergency threatening life, property, or the environment. • Except for an activity necessary for valid law enforcement purposes in the Sanctuary. • [See Department of Defense at the end of this table.]	**13. Operation of Motorized Personal Watercraft** Same as Proposed Action

Table 2.1-1, Page 6 of 9

Table 2.1-1. Regulatory Alternatives Considered for the CINMS Management Plan Update (Continued)

No Action (Status Quo)	Proposed Action Underlined (new) and ~~strikethrough~~ (deleted) text show differences from No Action (Status Quo)	Alternative 1 (**bold** text is different from Proposed Action)
14. Lightering **No existing regulation**	**14. Lightering** **No regulation proposed**	**14. Lightering** **Prohibited: Lightering in the Sanctuary.** Note: Sanctuary regulations define lightering as at-sea transfer of petroleum-based products, materials, or other matter from vessel to vessel (15 CFR 922.3). Exceptions: • Except for an activity necessary to respond to an emergency threatening life, property, or the environment. • Except for an activity necessary for valid law enforcement purposes in the Sanctuary. • [See Department of Defense at the end of this table.]
Department of Defense Activities. All activities currently carried out by the Department of Defense within the Sanctuary are essential for the national defense and, therefore, not subject to the prohibitions in this section. The exemption of additional activities having significant impact shall be determined in consultation between the Director and the Department of Defense.	**Department of Defense Activities.** ~~(b) All activities currently carried out by the Department of Defense within the Sanctuary are essential for the national defense and, therefore, not subject to the prohibitions in this section. The exemption of additional activities having significant impact shall be determined in consultation between the Director and the Department of Defense.~~ (b)(1) The prohibitions in paragraphs (a)(3) through (13) do not apply to military activities carried out by DOD as of the effective date of these regulations and specifically identified in section 3.5.9 (Department of Defense Activities) of the Final Channel Islands National Marine Sanctuary Management Plan/Environmental Impact Statement (FMP/FEIS), Volume II: Environmental Impact Statement, 2008, authored and published by NOAA ("pre-existing activities"). Copies of the document are available from the Channel Islands National Marine Sanctuary, 113 Harbor Way, Santa Barbara, CA 93109. Other military activities carried out by DOD may be exempted by the Director after consultation between the Director and DOD. (2) A military activity carried out by DOD as of the effective date of these regulations and specifically identified in the section entitled "Department of Defense Activity" of the FMP/FEIS is not considered a pre-existing activity if: (A) it is modified in such a way that requires the preparation of an environmental assessment or environmental impact statement under the National Environmental Policy Act, 42 U.S.C. 4321 *et seq.*, relevant to a Sanctuary resource or quality; (B) it is modified, including but not limited to changes in location or frequency, in such a way that its possible adverse effects on Sanctuary resources or qualities are significantly greater than previously considered for the unmodified activity; (C) it is modified, including but not limited to changes in location or frequency, in such a way that its possible adverse effects on Sanctuary resources or qualities are significantly different in manner than previously considered for the unmodified activity; or (D) there are new circumstances or information relevant to a Sanctuary resource or quality that were not addressed in the FMP/FEIS. (3) In the event of destruction of, loss of, or injury to a Sanctuary resource or quality resulting from an incident, including, but not limited to, discharges, deposits, and groundings, caused by a DOD activity, DOD, in coordination with the Director, must promptly prevent and mitigate further damage and must restore or replace the Sanctuary resource or quality in a manner approved by the Director. (4) All DOD activities must be carried out in a manner that avoids to the maximum extent practicable any adverse impacts on Sanctuary resources and qualities.	**Department of Defense Activities.** Same as Proposed Action.

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Table 2.1-1. Regulatory Alternatives Considered for the CINMS Management Plan Update (Continued)

No Action (Status Quo)	**Proposed Action** Underlined (new) and ~~strikethrough~~ (deleted) text show differences from No Action (Status Quo)	**Alternative 1** (**bold** text is different from Proposed Action)
Permit Procedures and Issuance Criteria. (a) Any person in possession of a valid permit issued by the Director in accordance with this section and Sec.922.48 may conduct any activity in the Sanctuary prohibited under Sec. 922.71 [see above] if such activity is either: (1) Research related to the resources of the Sanctuary, (2) To further the educational value of the Sanctuary; or (3) For salvage or recovery operations. (b) Permit applications shall be addressed to: Director, Office of Ocean and Coastal Resource Management, ATTN: Manager, Channel Islands National Marine Sanctuary, 113 Harbor Way, Santa Barbara, CA 93109. (c) In considering whether to grant a permit the Director shall evaluate such matters as: (1) The general professional, and financial responsibility of the applicant; (2) The appropriateness of the methods envisioned to the purpose(s) of the activity; (3) 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; (4) The end value of the activity and (5) Such other matters as may be deemed appropriate. The Director may observe any permitted activity and/or require the submission of one or more reports of the status or progress of such activity. Any information obtained shall be available to the public.	**Permit Procedures and Issuance Criteria.** (a) ~~Any~~ person ~~in possession of a valid permit issued by the Director in accordance with this section and Sec.922.48~~ may conduct an~~y~~ activity ~~in the Sanctuary~~ prohibited ~~under~~ by 922.71~~1~~2(a)(3) through (10), (a)(12), and (a)(13), and 922.73, if such activity is ~~either:~~ ~~(1) Research related to the resources of the Sanctuary,~~ ~~(2) To further the educational value of the Sanctuary; or~~ ~~(3) For salvage or recovery operations.~~ specifically authorized by, and conducted in accordance with the scope, purpose, terms, and conditions of, a permit issued under 922.48 and this section. (b) The Director, at his or her sole discretion, may issue a permit, subject to terms and conditions as he or she deems appropriate, to conduct an activity prohibited by 922.72(a)(3) through (10), (a)(12), and (a)(13), or 922.73, if the Director finds that the activity: (1) Is appropriate research designed to further understanding of Sanctuary resources and qualities; (2) Will further the educational value of the Sanctuary; (3) Will further salvage or recovery operations in or near the Sanctuary in connection with a recent air or marine casualty; (4) Will assist in managing the Sanctuary; or (5) Will further salvage or recovery operations in connection with an abandoned shipwreck in the Sanctuary title to which is held by the State of California. (c) ~~In considering whether to grant a permit the Director shall evaluate such matters as:~~ The Director may not issue a permit under 922.48 and this section unless the Director also finds that: ~~(1) The general professional, and financial responsibility of the applicant;~~ ~~(2) The appropriateness of the methods envisioned to the purpose(s) of the activity;~~ (3) 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; ~~(4)The end value of the activity and~~ ~~(5) Such other matters as may be deemed appropriate.~~ (1) The proposed activity will have at most short-term and negligible adverse effects on Sanctuary resources and qualities; (2) The applicant is professionally qualified to conduct and complete the proposed activity; (3)The applicant has adequate financial resources available to conduct and complete the proposed activity; (4) The duration of the proposed activity is no longer than necessary to achieve its stated purpose; (5) The methods and procedures proposed by the applicant are appropriate to achieve the goals of the proposed activity, especially in relation to the potential effects of the proposed activity on Sanctuary resources and qualities; (6) The proposed activity will be conducted in a manner compatible with the primary objective of protection of Sanctuary resources and qualities, considering the extent to which the conduct of the activity may diminish or enhance Sanctuary resources and qualities, any potential indirect, secondary, or cumulative effects of the activity, and the duration of such effects; (7)The proposed activity will be conducted in a manner compatible with the value of the Sanctuary as a source of recreation and as a source of educational and scientific information, considering the extent to which the conduct of the activity may result in conflicts between different users of the Sanctuary and the duration of such effects; (8) It is necessary to conduct the proposed activity within the Sanctuary;	**Permit Procedures and Issuance Criteria.** Same as Proposed Action

Table 2.1-1. Regulatory Alternatives Considered for the CINMS Management Plan Update (Continued)

No Action (Status Quo)	**Proposed Action** Underlined (new) and ~~strikethrough~~ (deleted) text show differences from No Action (Status Quo)	**Alternative 1** (**bold** text is different from Proposed Action)
	(9) The reasonably expected end value of the proposed activity furthers Sanctuary goals and purposes and outweighs any potential adverse effects on Sanctuary resources and qualities from the conduct of the activity; and (10) Any other matters the Director deems appropriate do not make the issuance of a permit for the proposed activity inappropriate. (d) Applications. ~~(b)~~(1) ~~Permit a~~Applications for permits ~~shall~~ should be addressed to~~:~~ the Director, Office of ~~Ocean and Coastal Resource Management~~ National Marine Sanctuaries~~.~~; ATTN: Manager, Channel Islands National Marine Sanctuary, 113 Harbor Way, Santa Barbara, CA 93109. (2) In addition to the information listed in 922.48(b), all applications must include information the Director needs to make the findings in paragraphs (b) and (c) of this section. (e) In addition to any other terms and conditions that the Director deems appropriate, a permit issued pursuant to this section must require that the permittee agrees to hold the United States harmless against any claims arising out of the conduct of the permitted activities.	

Table 2.1-1, Page 9 of 9

3.0 AFFECTED ENVIRONMENT

The Channel Islands and surrounding ecosystems are unique and highly valued, as demonstrated by, for example, several national and international designations. In 1980 the United States designated both the Channel Islands National Marine Sanctuary, and the Channel Islands National Park. In addition, the United Nations Educational, Scientific and Cultural Organization's (UNESCO) Man and the Biosphere Program designated the Sanctuary as a Biosphere Reserve in 1986. This area is characterized by a unique combination of features including: complex oceanography, varied bathymetry, diverse habitats, remarkable biodiversity, rich maritime heritage, remote yet accessible location, and relative lack of development. These features yield high existence values as well as human use values for research, education, recreation, and commerce.

This section defines the CINMS Management Plan Update Study Area, and describes the affected environment within that Study Area in five sub-sections:

- 3.1 Marine Ecosystems introduces the basic concept of a marine ecosystem, which provides context for the remaining four sub-sections;
- 3.2 Physical Environment describes the geology, oceanography, and meteorology within the Study Area;
- 3.3 Biological Environment describes the Study Area in terms of bioregions, biotic communities, coastal watersheds, and coastal processes, as well as select relevant regulatory information;
- 3.4 Maritime Heritage Resources describes the cultural and historic components of maritime heritage resources in the Sanctuary and Study Area; and
- 3.5 Human Uses describes activities that occur within the Study Area, such as those pertaining to: oil and gas, fiber optic telecommunications cables, vessel traffic and harbors, contaminant sources, release of introduced species, fishing, marine bioprospecting, nonconsumptive recreation and tourism, Department of Defense activities, and research and education, along with select relevant regulatory information.

The Study Area, within which the current CINMS boundary lies, is shown in Figure 1.2-2. The Study Area begins on the coast north of Point Sal, at 33.00 degrees north (N) latitude, 120.64 degrees west (W) longitude. The Study Area then takes the following progression:

- West to 35.00 degrees N, 121.17 degrees W;
- South to 34.33 degrees N, 121.17 degrees W;
- East to 34.33 degrees N, 120.67 degrees W;
- South to 33.67 degrees N, 120.67 degrees W;
- East to 33.67 degrees N, 119.17 degrees W;
- South to 33.33 degrees N, 119.17 degrees W;
- East to 33.33 degrees N, 118.83 degrees W; and

- North to 34.02 degrees N, 118.83 degrees W.

Encompassed within the Study Area, the Sanctuary consists of an area of approximately 1,128 square nautical miles (nmi), off the southern coast of California. The Sanctuary boundary 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). While the proposed regulatory changes pertain to the current CINMS boundary, outside influences within the Study Area are also discussed to provide the background necessary to understand the relationship between the dynamics of the marine environment and successful management of the CINMS.

Additional information about biological and maritime heritage resources can be found at FEIS Appendix C. Also, a comprehensive source of information about the physical environment, habitats, invertebrates, marine plants, fish, seabirds, marine mammals, and other resources found within the CINMS is found in *Marine Protected Areas in NOAA's Channel Islands National Marine Sanctuary – Final Environmental Document* (2002), available on line at http://www.dfg.ca.gov/mrd/ci_ceqa/index.html.

3.1 MARINE ECOSYSTEMS

3.1.1 Introduction

The NMSA at 16 U.S.C. 1431(a)(3) states that "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." As a consequence, one of the management priorities for the CINMS is "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" (16 U.S.C. 1431(b)(3)). This management priority requires a broad and comprehensive approach to resource protection. Such an approach brings a focus on large-scale, ecosystem level protection and management, which is unique *vis-à-vis* the various agencies and laws directed at managing single or limited numbers of species or specific human activities within the ocean.

An "ecosystem" is commonly defined as "a unit of land or water comprising populations or organisms considered together with their physical environment and the interacting processes between them" (U.S. Navy 2000). Marine ecosystem management is sensitive to the spatial occurrence, form, dynamic nature, and extent of biophysical processes and human activities and uses that affect marine life. Overall, marine ecosystems include ecological links and relationships between oceanographic processes, such as currents and eddies, and biology and climate-related factors (McGinnis 2000).

3.2 PHYSICAL ENVIRONMENT

The CINMS and Study Area lie within the northern portion of the southern California bight (SCB). The SCB is formed by a physically defined transition in the California coastline wherein the north-south trending coast begins to trend east-west. The SCB extends from Point Conception, California, to Punta Banda, south of Ensenada, Baja California, Mexico (Dailey *et al.* 1993).

3.2.1 Geology/Oceanography

The geologic resources of an area consist of formational, depositional, and volcanic rocks and the soil derived from these sources. Geologic resources can also include unique landforms, tectonic features, and

fossils. In coastal and marine settings, sediments are considered a part of the geologic resources of the area. These geologic features can have economic, scientific, and recreational value.

Figure 3.2-1 shows the geologic features of the Study Area. The four Northern Channel Islands (San Miguel, Santa Rosa, Santa Cruz, and Anacapa) parallel the east-west trend of the coast and vary from about 13 to 25 miles offshore. Santa Barbara Island lies about 40 miles south of Point Mugu, California. These islands are all located within a unique oceanographic region known as the Continental Borderland (Norris and Webb 1990).

The Continental Borderland is the section of offshore California between Point Conception and Punta Banda in Baja California (Mexico). Continued large-scale overriding of the North American Plate by the Pacific Plate in southern California caused movement along the San Andreas Fault System (Dailey *et al.* 1993). The Continental Borderland, with its wide shelf and series of laterally shifted blocks, resulted from this movement. It extends seaward for up to 300 miles (Dailey *et al.* 1993). Unlike most wide continental shelves that consist of gently sloping platforms interrupted by low banks and occasional canyons, the Continental Borderland is a region of basins and elevated ridges. The Channel Islands are the portions of the ridges that rise above sea level. The highest point in the Channel Islands is Picacho Diablo on Santa Cruz Island, with an elevation of 2,450 feet (747 meters).

Basin and trough slopes account for 63 percent (19,210 square miles) of the borderlands area (Norris and Webb 1990). Basin and trough floors represent 17 percent of the total area (5,120 square miles), while the islands comprise only 1.1 percent of the total area (340 square miles). The Santa Barbara Basin, oriented east-west in parallel with the coastline and the islands, lies between the islands and the mainland, and is approximately 1,650 feet (500 meters) deep. The remaining basins trend northwest. The basins nearest the mainland are the shallowest and have the flattest floors and thickest sediment fill. The northwest-trending basins range in depth from 1,650 to 8,250 feet (500 to 2,500 meters). The seaward edge of the Continental Borderland is the Patton Escarpment, a true continental slope that descends 13,200 feet (4,000 meters) to the deep ocean floor (Norris and Webb 1990). Figure 3.2-1 shows the bathymetry of the Study Area.

There are at least 32 submarine canyons in the Continental Borderland. Along the mainland coast, there are six prominent canyons thought to be related to the modern shoreline. Other coastal canyons appear to be related to the shoreline and lower sea levels during the Ice Age that ended approximately 12,000 years ago (Norris and Webb 1990). There are also canyons cut into offshore basins in the region (Dailey *et al.* 1993).

3.2.1.1 Sediment Transport

Sediments deposited in the offshore region include sand, silt, clay, and biogenic particulates (aggregates of planktonic origin) (Dailey *et al.* 1993). Sand, silt, and clay are discharged by rivers during the winter rainy season. Waves carry the sand in shallow suspension along the shore within the beach and inshore zone. Periodic strong storms produce long period swells and turbulence, which move the sand offshore to the inner and central shelf. Nearshore submarine canyons intercept much of the transported sand. Lack of turbulence in these deeper waters prevents these sediments from being re-suspended and silt and clay slowly settle out as the water circulates through a general pattern. The pattern of surface water circulation in the Channel Islands region tends to move fine suspended sediment into the Santa Barbara Basin from the California Current System to the west and through the Anacapa Passage to the southeast. As a result, the rate of silt and clay deposition in the Santa Barbara Basin is high (Dailey *et al.* 1993). Biogenic particulates represent 20 percent of the borderland sediments (Dailey *et al.* 1993). Unlike the sediments discharged seasonally by rivers, the biogenic particulates are produced continually, although seasonal blooms of algae increase their rate of production. Borderland sediments also include carbonate, opaline

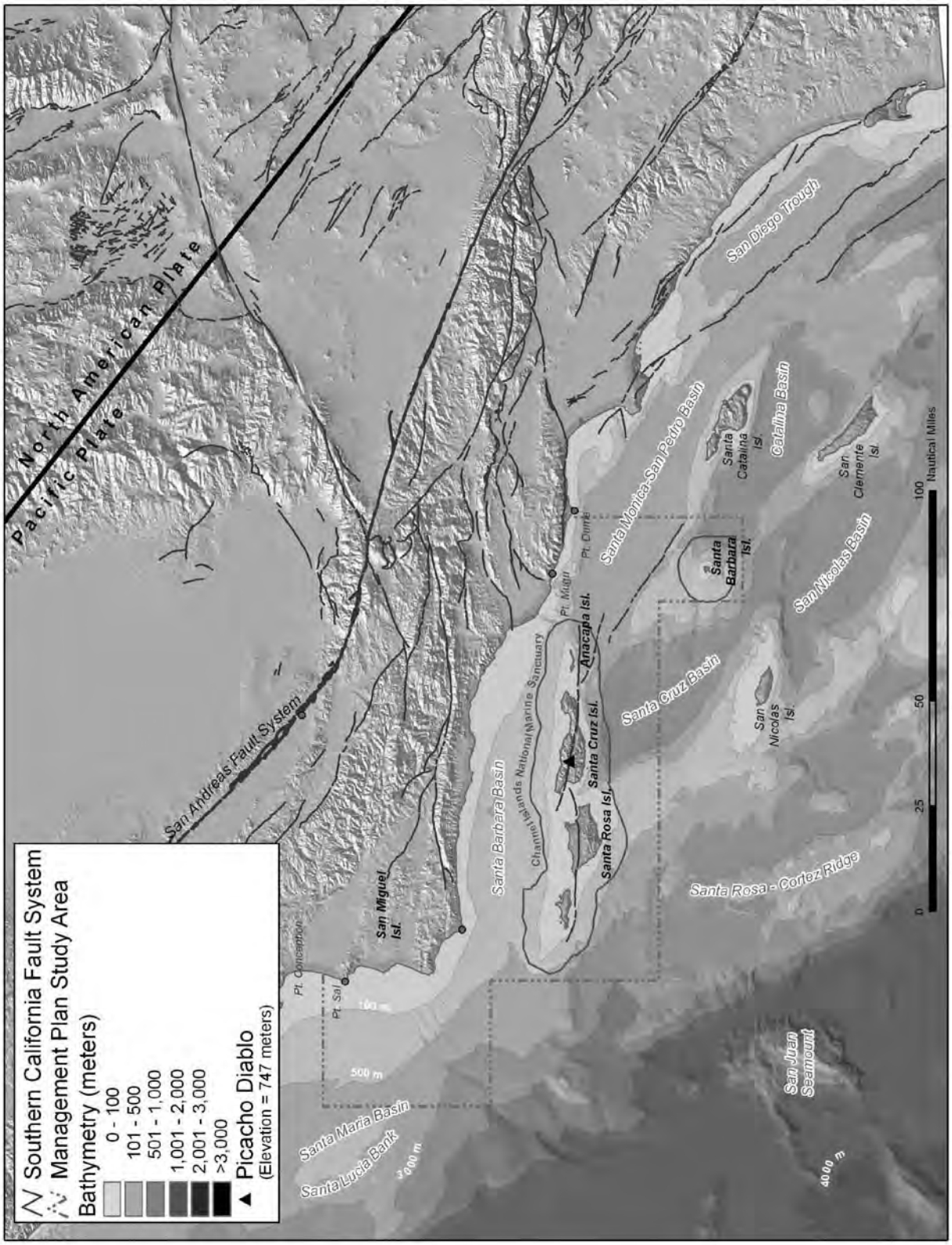


Figure 3.2-1 CINMS EIS Study Area Geologic Features and Bathymetry

silica, and other organically derived matter (Dailey *et al.* 1993). A thick blanket of this sediment covers most of the borderland (Norris and Webb 1990).

The morphology of the SCB includes 12 major offshore basins. All of the basins are completely enclosed at some depth and semi-enclosed at shallower depths. Thus the region includes time-variable circulations characteristic of enclosed basins as well as fluctuating flows over the sills between the basins (Dailey *et al.* 1993).

The central bottom waters of the Santa Barbara Basin are anoxic, or oxygen depleted, meaning the concentration of dissolved oxygen in the water is less than 0.1 milliliter per liter (ml/L) (Dailey *et al.* 1993). The bottom waters entering the basin over the western sill (on the west end of the Santa Barbara Basin) also have a low oxygen content. In addition, organic carbon content increases with the increase of clay. As the organic material decays, it consumes oxygen faster than it can be replaced. Oxygen availability is the major factor controlling benthic communities in the Santa Barbara Basin. Anoxic central basin bottom waters are considered to be the source conditions for petroleum generation. In the geologic past, similar environments formed the oil-bearing black shales found extensively in both ocean floor and continental stratigraphies (Dailey *et al.* 1993).

3.2.1.2 Geologic Structure

The basins and ridges of the Continental Borderland are believed to have been formed by large-scale synclinal (strata bending upward away from the bed) and anticlinal (strata bending downward away from the crest) folding (Norris and Webb 1990). Some of the ridges, such as the Santa Rosa-Cortes Ridge, appear to be antiforms, or anticline-like structures in which the stratigraphic sequence is not known (Norris and Webb 1990). The four northern Channel Islands form an east-west mountain chain along the southwest border of the Transverse Ranges physiographic province (Weigand *et al.* 1994). The island chain appears to be a highly faulted, east-west trending anticlinorium (Weaver *et al.* 1969). The Transverse Ranges are unusual because of their topography, and the faults and folds that produce them, are oriented east-west. Within the last 17 million years, the Transverse Ranges rotated clockwise 90 degrees or more, to arrive in their unique orientation (Sorlien 1994). A thin sheet of upper-plate western Transverse Range crust separated from the northwest-southeast trending Peninsular Ranges that run from southern California south to Mexico, and was transported above sub-horizontal detachment faults (Sorlien 1994). Santa Rosa and Santa Cruz Islands are at the end of this rotating sheet, and were located west of San Diego before the rotation began. There is evidence that the rotation is still continuing (Sorlien 1994).

There are about 30 principal, east-west trending faults in the Channel Islands area (Norris and Webb 1990). Santa Cruz Island and Santa Rosa Island are both bisected by east-west trending faults that continue offshore. These two faults interconnect with the southern frontal faults of the western Transverse Ranges further east, such as the Dume, Malibu Coast, and Santa Monica faults, and form a part of a 200-kilometer-long fault system extending from Pasadena to San Miguel Island. The Channel Islands Fault Zone, a major fault system, lies beneath the Santa Barbara Channel north of Santa Cruz Island (Sorlien 1994).

3.2.1.3 Rocks

The oldest rocks in the region are metamorphic rocks of the Jurassic period (208 to 144 million years ago). These include the Santa Monica slate and the Santa Cruz Island schist. Rocks of the Franciscan subduction complex are also thought to underlie the Continental Borderland (Norris and Webb 1990). The late Jurassic to early Cretaceous Franciscan complex includes greenish-gray graywacke (sandstones), shales, chert, limestone, and fragments of ophiolite sequences. The basement rocks in the region are overlain by sedimentary Cretaceous and Cenozoic age rocks (Paleocene, Eocene, and Miocene). San

Miguel Island has outcrops of late Cretaceous marine sandstone and shale. Paleocene marine sandstone occurs on Santa Cruz and San Miguel Islands. Eocene rocks are found on southwestern Santa Cruz Island, Santa Rosa Island, and San Miguel Island. The Miocene rocks are the youngest (23.5 to 5 million years old) rocks in the region and they are exposed on all four of the northern Channel Islands.

Miocene age rocks include the Monterey formation, the San Onofre breccia, and various volcanics. The Monterey formation is composed of deep-water, diatomaceous, dolomitic, and cherty shales, and often contains pockets of bituminous material. The Monterey formation is an important reservoir for gas and oil. The San Onofre breccia is a coarse-grained breccia and conglomerate with prominent clasts of blue glaucophane schist, green schist, gabbro, and limestone. Miocene volcanics include andesitic, diabasic, and basaltic flow, sills, and dikes, many of submarine origin (Norris and Webb 1990). Marine and non-marine terrace deposits of Pleistocene age (1.8 million to 10,000 years old) and younger overlie the Miocene rocks on the Channel Islands (Norris and Webb 1990). San Miguel and Santa Cruz Islands have locally thick marine terrace deposits.

3.2.1.4 Oil and Natural Gas

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 1.8 miles 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 seep releases more hydrocarbon gases than all of the mobile sources (mostly automobiles) in Santa Barbara County. The dissolved hydrocarbon plume extends several miles down-current from the vents (Washburn *et al*. 1996).

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 platforms (Norris and Webb 1990). The first offshore oil field developed in North America was the Summerland field, discovered in 1896. The Dos Cuadras field, a major field by American standards, lies only 1,000 feet (300 meters) below the sea floor southeast of the city of Santa Barbara (Norris and Webb 1990). This field was the source of the extensive Santa Barbara oil spill in 1969. Other oil fields beneath the channel include the Coal Oil Point, Ellwood Offshore, and Hondo Offshore fields. Just north of Point Conception, the Point Arguello field was discovered in 1981. This major oil field may ultimately recover over 200 million barrels of oil.

The majority of oil and gas development in Southern California between the 1960s through the 1990s took place off the coast of Santa Barbara County. Much of that activity occurred in the Santa Barbara Channel (Norris and Webb 1990).

3.2.2 Meteorology

The Study Area has a Mediterranean climate characterized by mild winters, when most rainfall occurs, and warm, dry summers. The regional climate is dominated by a strong and persistent high pressure system that frequently lies 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 to northwest later in the day. Transport of cool, humid marine air onshore by these northwest winds causes frequent fog and low clouds near the coast, particularly during night and morning hours in the late spring and early summer months.

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

3.2.2.1 Wind and Topography

Topography plays a significant role in direction and speed of winds in the Study Area. During the day, the sea breeze (from sea to land) is dominant. The sea breeze is typically northwesterly throughout the year although local topography causes variations in this pattern. During summer months, these northwesterly winds are stronger and persist later into the night. Wind direction reverses in the evening as the air mass over land cools, becomes heavier, and flows down the coastal mountains and mountain valleys back toward the ocean as land breezes (from land to sea). This diurnal "sloshing" can aggravate pollution problems by continually moving the same air mass over pollution sources. This effect is more pronounced during periods when wind speeds and turbulent mixing are low.

The terrain around Point Conception, combined with the change in orientation of the coastline from north-south to east-west, can cause counterclockwise circulation (eddies) to form east of the point. These eddies fluctuate from time to time and place to place, leading to highly variable winds along the southern coastal strip. Point Conception also marks the change in the prevailing surface winds from northwesterly to southwesterly.

In addition to topography, several other factors also affect winds in the Study Area. During the fall and winter months, the region is subject to Santa Ana winds, which are warm, dry, strong, and gusty winds that blow northeasterly from the inland desert basins through the mountain valleys and out to sea. Wind speeds associated with Santa Ana conditions are generally 15 to 20 miles per hour (mph) although they can reach speeds in excess of 60 mph. "Sundowner" winds are a local phenomenon on the coastal strip below the canyons. Similar to Santa Ana conditions, warm, gusty winds blow sometimes with great intensity down canyons toward the sea. However, these winds are local and are caused by land-sea and diurnal temperature variations. Elevation may also affect wind patterns. The winds at 1,000 feet and 3,000 feet are generally from the north or northwest. Southerly and easterly winds occur frequently in winter and occasionally in the summer.

3.2.2.2 Sunlight

Fog occurs along the coast and in inland valleys from late spring to mid-summer and cloudy conditions occur during winter storms. Since sunlight is the driver of the photochemical reactions that produce ozone and other photochemicals, the prevalence of sunlight is yet another contributor to photochemical smog.

3.2.2.3 Air Quality

Atmospheric stability is a primary factor affecting air quality. Atmospheric stability regulates the amount of air exchange (referred to as mixing) both horizontally and vertically. Restricted mixing (that is, a high degree of stability) and low wind speeds are generally associated with higher pollutant concentrations. These conditions are typically related to temperature inversions that cap the pollutants emitted below or within them. An inversion is characterized by a layer of warmer air above the cooler air mass near the ground, preventing pollutants in the lower air mass from dispersing upward beyond the inversion "lid." This results in higher concentration of pollutants trapped below the inversion.

The airflow around the Study Area plays an important role in exacerbating the movement of pollutants. Wind speeds typical of the region are generally light, another factor that tends to cause higher levels of pollution, since low wind speeds minimize dispersion of pollutants.

During Santa Ana conditions, pollutants emitted in Santa Barbara, Ventura County, and the South Coast Air Basin (SCAB, which includes the Los Angeles region) are moved out to sea. These pollutants can then move back onshore to Santa Barbara County (via the Santa Barbara Channel) in what is called a "post Santa Ana condition." They may also become entrained in offshore winds and get transported farther south before coming onshore.

3.2.3 Physical Oceanography

The south-flowing California Current and the north-flowing Southern California Countercurrent (Figure 3.2-2) dominate the mean water circulation in the SCB (Dailey *et al.* 1993). In the Study Area, currents in the Santa Barbara Channel include patterns of warm water from the Southern California Countercurrent and cold water from the California Current. Upwelling often occurs where these currents meet, near the massive headlands of Point Arguello and Point Conception, as well as along much of the California coast, depending on the season. Oceanographic thermal fronts are abundant in the Santa Barbara Channel and form as a consequence of upwelling and of current shear between the two primary currents (Harms and Winant 1998). Near Point Conception, the continental shelf is broad and deflects the south-flowing California Current offshore of the SCB and along the shores of the northern Channel Islands (Brink and Muench 1986).

3.2.3.1 Offshore Ocean Currents

Offshore circulation in the Study Area is a dynamic system resulting from the interaction of large-scale ocean currents, local geography, and the unique basin and ridge topography of the ocean bottom in the SCB (see Figure 3.2-2). The California Current is a major ocean current that moves through the Study Area (Figure 3.2-2), staying largely to the west of the islands, but influencing the circulation patterns in the region. Year-round, this current brings cold water from the Gulf of Alaska southward down the coast of California. At Point Conception, where the coastline turns east, the California Current moves further offshore as it continues its southward flow. Near the United States-Mexico border the California Current turns east and then north, and flows back up along the coast and 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). The Southern California Countercurrent moves warm water from southern California northwestward up the coast (Hickey 2000b) 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 (Hickey Basin Exchange). 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 Nino. 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 currents also influence circulation in the Study Area. These currents are the result of prevailing winds and the orientation of the coastline. Due to a process called Ekman transport, wind blowing over water in the northern hemisphere moves the surface water about 45 degrees to the right of the wind direction. Where the wind pushes surface water away from a coastline, deeper water moves up toward the surface to take its place, creating an upwelling current. Along the north-south oriented coast

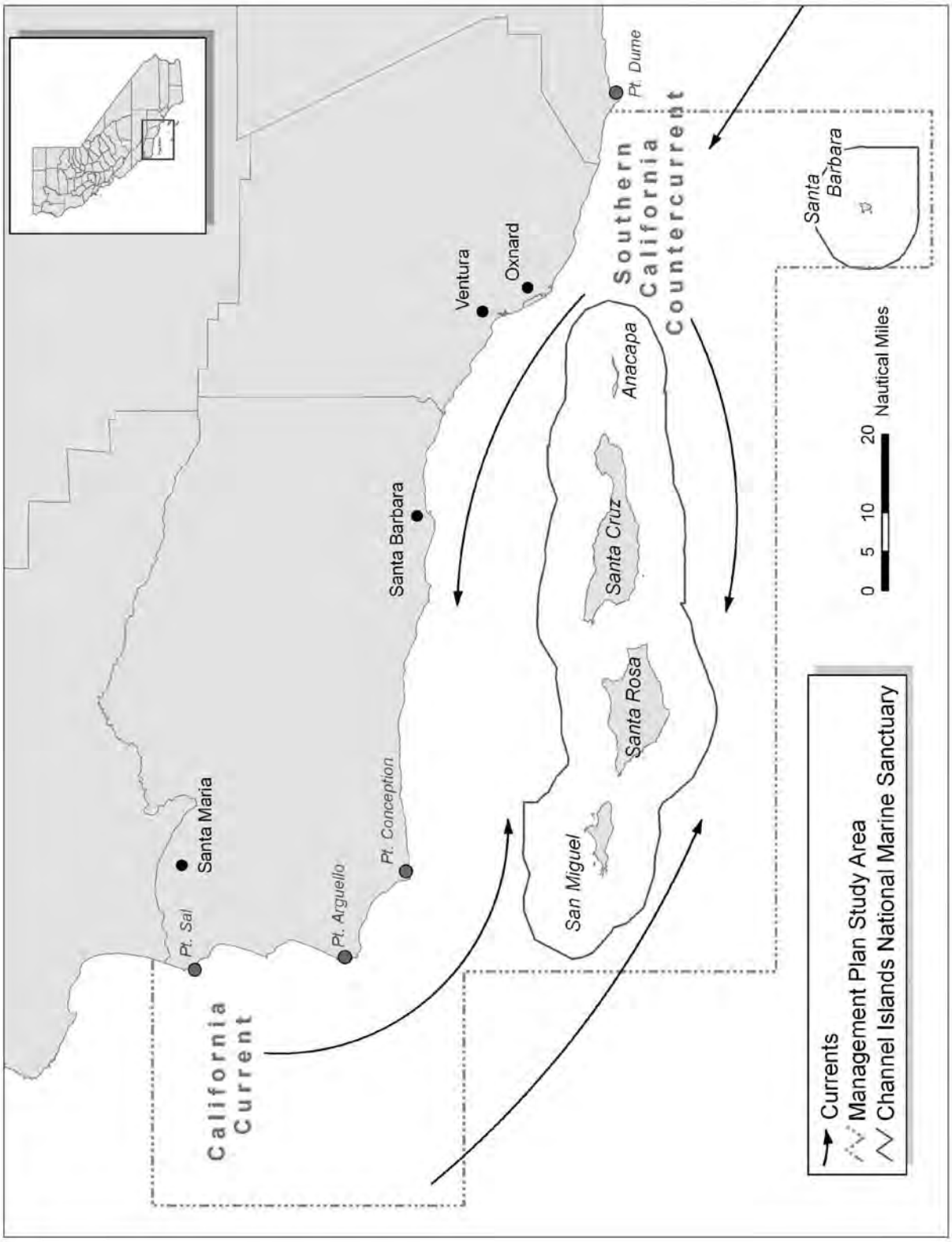


Figure 3.2-2 CINMS EIS Study Area Currents

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 (San Francisco State University 2000). At Point Conception, where the coastline makes an almost right-angle bend to the east, upwelling essentially ceases. Upwelling is rare along the mainland coast of the Santa Barbara Channel because the headlands at Point Conception shelter the east-west oriented channel from the strong northwesterly winds that generate upwelling (Love *et al.* 1999). Point Conception is the last 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).

Within the Santa Barbara Channel, a localized cyclonic gyre exists year-round (Hendershott and Winant 1996) with seasonal variations in intensity. In general, cool water enters the Channel from the west and flows eastward along the Channel Islands while warm water enters the Channel from the east and flows westward along the coast. Winant and Harms (2000) identify six distinct patterns; Upwelling, Relaxation, Cyclonic, Propagating Cyclones, Flood East, and Flood West. In the Upwelling pattern, there is a strong south and southeastward flow of cool water from Point Conception and along the north sides of the Channel Islands; a weak warm water current flows toward the northwest along the mainland. In the Relaxation pattern, there is a strong northwestward flow of warm water into the Channel from the east, and a weak inflow of cold water from the west. The Cyclonic pattern is an elongated, closed pattern created when the central eddy is strongest, and there is little flow into the channel from either the west or the east. In the Propagating Cyclones pattern, small, tight circular flow cells form in the center of the Channel and drift toward the west. These four patterns form in spring, summer, and fall, but the cyclonicity is strongest in summer and weakest in winter. In the winter, directional flow patterns form. The winter Flood East pattern consists of a strong eastward flow into the Channel along the coastline, and lesser eastward inflow along the Channel Islands. The winter Flood West pattern has a strong northwestward flow along the coast, and a weaker northwest flow along the islands.

Two opposing forces generate the cyclonic flow patterns: a poleward pressure gradient and an equatorward wind stress (Nishimoto and Washburn 2002). In the warm waters of the SCB, sea level is higher than in the cold, upwelled waters north of Point Conception. This difference in sea level creates a poleward pressure gradient that draws water westward through the channel. Upwelling-favorable winds tend to drive strong eastward flow, opposing the westward pressure gradient. When the effect of wind equals that of the pressure gradient, the cyclonic flow patterns form. Imbalances in the two competing forces create the pattern variations described above.

Nishimoto and Washburn (2002) found that the eddy circulation in the Santa Barbara Channel extended to depths of at least 650 feet (200 meters), or nearly half the total channel depth, and suggest that persistent cyclonic eddies play an important role in maintaining marine populations through climate changes. Cold water uplifted in the center of the eddy may provide an additional source of nutrients during a shift to a warm-water regime, increasing primary productivity and the amount of food available for fish. Nishimoto and Washburn (2002) found large aggregations of juvenile fishes concentrated in an eddy in the Santa Barbara Channel. The researchers suggest that high food availability and feeding success contributed to faster growth and higher survivorship of these fishes. Nishimoto and Washburn (2002) note that the fishes were entrained in the eddy current in their larval stages and remained there until they passed the juvenile stage, when they grew strong enough to escape the circulating current.

Hickey (2000a) found that the sediments in ocean basins of the SCB are near anoxic to anoxic, and that the anoxic area is increasing. Expansion of the anoxic areas reduces the ability of the basin sediments to support marine life. The high ridges between the basins essentially prevent influx of oxygen-bearing

water into the basins, which is important for maintaining oxygen levels within the basins. The events that bring oxygen to the basins are associated with processes in the upper water column above the basin. Strong upwelling and southeastward flow from the Santa Barbara Channel into the Santa Monica Basin appear to drive cold, denser water over the ridges into the basins, where it mixes with the ambient water confined within the basins. Influxes of oxygen-bearing cold water to the basins occur only for a few days at a time, after intervals of several years (Hickey 2000a). An intense coastal upwelling event off Point Conception can cause rapid renewal of the water in this basin. Within the last 40 years, water in the Santa Barbara Channel has overturned several times (Hickey 1993).

3.2.3.2 Waves

Waves in the Santa Barbara Channel are produced by seasonal swells crossing the open ocean, the sheltering effect of Point Conception and the Channel Islands, the variable wind fields arising from the mountainous coastal and island topography, and the complex shallow water bathymetry within the Channel (O'Reilly *et al.* 2000).

Deep water swells from winter storms typically enter the channel from the west or west-southwest, for the most part unbroken by the Channel Islands. West swells produce high waves along the south-facing coastline just south of Point Conception and at the eastern end of the Channel south of Ventura. A massive fan of sediment deposited on the shelf by the Ventura and Santa Clara rivers concentrates much of the wave energy traveling eastward down the channel onto a narrow section of coastline near the Santa Clara River mouth (O'Reilly *et al.* 2000). When the deep water swell originates more from the west-southwest, this focusing zone shifts directly northward into the Ventura area. West swells can also produce large waves at Rincon Point west of Ventura. Wave heights increase along portions of the Channel Islands that border the south side of the Channel (O'Reilly *et al.* 2000). On the north side of Santa Cruz Island, the large extent of sheer coastal cliffs that drop straight into water depths of 33 feet (10 meters) or more are a good wave reflector.

In the summer, deep water swells originate in the south Pacific, and encounter the Channel Islands as they move north toward California. The islands shelter most of the channel and the south-facing coast from summer swells, significantly limiting wave heights. South swells from storms near New Zealand enter the western end of the channel while those originating further east near South America are almost entirely obstructed. South swells travel past Anacapa Island and reach the coast near Ventura and Rincon Point. Rare swells originating from the southeast can reach the coast at Santa Barbara (O'Reilly *et al.* 2000).

3.2.3.3 Water Temperature

Much of the uniqueness of the SCB and the adjacent marine environment north to Point Sal is due to the mixing of water masses from the south-flowing cold California Current and the north-flowing warm Southern California Countercurrent. These complex water movements result in differential temperature, nutrient, and larval recruitment conditions among the islands and along the coast north and south of Point Conception. In addition, prevailing winds periodically push surface water offshore from the Point Conception area, causing upwelling of cold, nutrient-rich water that bathes the northwestern islands, but rarely reaches the southeastern islands. It is difficult to separate the effects of temperature, nutrients, and larval drift on the distribution and abundance of marine life in the Study Area. Because the oceanographic influences typically vary, temperature is the easiest parameter to measure, and temperature clearly has major effects on marine life; it has become the standard means for characterizing northern (Oregonian) versus southern (Californian) biotic assemblages.

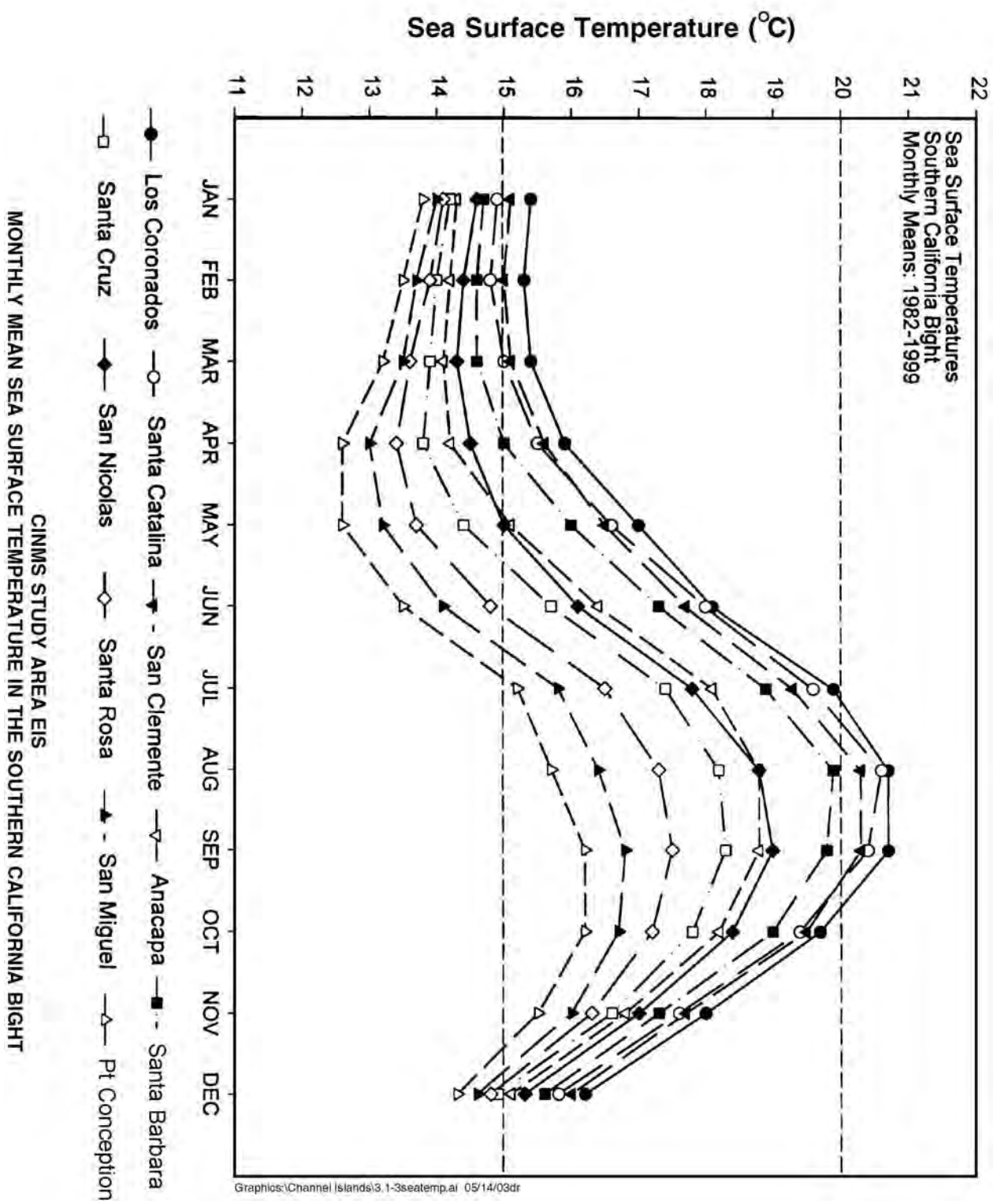
Broad-scale sea surface temperatures (SST) obtained from satellite infrared photographs (with ground truth from oceanographic data buoys) provide the best long-term records of concurrent temperature

regimes throughout the Study Area. Depending on the depth, season, and particular location, surface temperatures may differ considerably from subsurface values, yet SST do reflect reasonably consistent general temperature relationships (Bernstein *et al.* 1977; List and Koh 1976). Water temperature regimes for nearshore habitats are not completely known. Specific data are available for particular locations, depths, and times. For example, CINP, the Tatman Foundation Channel Islands Research Program, and the University of California, Santa Barbara's Partnership for Interdisciplinary Study of Coastal Oceans (PISCO) Program have had intertidal and subtidal thermisters in place at specific locations in recent years. However, deepwater temperature data are primarily available from periodic California Cooperative Oceanic Fisheries Investigation (CalCOFI) cruises.

Mean monthly SST for each of the Channel Islands, as well as at Point Conception and Los Coronados Islands (near San Diego), for the 18-year period from 1982 to 1999 reveal characteristic trends that confirm the transitional nature of this special biogeographic region (Figure 3.2-3). All ten locations show a generally similar pattern of seasonal fluctuations, with lowest SST from January to March (except for Santa Rosa and San Miguel Islands and Point Conception, where upwelled water flowing southeast from Point Conception causes low SST also in April and May) and highest SST from July to October. Except for the Santa Catalina/San Clemente and San Nicolas/Anacapa island pairs, the locations have consistently separate temperature regimes. North/south SST differences are greatest in August (5.0 degrees Celsius [C]) and least in January (1.6 degrees C). Overall, there is a clear southeast to northwest trend of decreasing surface water temperatures for the 10 representative locations that correlates well with differences in species assemblages (Engle 1994; Murray *et al.* 1980; Murray and Bray 1993; Seapy and Littler 1980; Thompson *et al.* 1993). The warmest areas are Los Coronados (San Diego), Santa Catalina, San Clemente, and Santa Barbara Islands. San Nicolas, Anacapa, and Santa Cruz Islands are intermediate. The coldest regions are Santa Rosa, San Miguel, and Point Conception. If areas north of Point Conception were plotted, they would show incrementally colder temperatures.

The extent to which cold water enters the Santa Barbara Channel is variable (Harms and Winant 1998). In general, while the cold-water mass surrounds the north shores of San Miguel and Santa Rosa Islands, the north shore of Santa Cruz Island is alternately surrounded by the cold-water and warm-water masses. If upwelling is intense, the cold-water mass can reach the north side of Santa Cruz Island and will intrude into the pass between Santa Rosa and Santa Cruz Islands.

Temperature-related oceanographic phenomena influencing marine life at the islands vary considerably over time scales ranging from minutes to decades or more. Many organisms are adapted to withstand typical short-term fluctuations; however, seasonal or longer trends may kill sensitive species or enhance survival of tolerant species, resulting in profound community effects (Tegner and Dayton 1987; Dayton *et al.* 1992). For long-term perspective, daily surface water temperature records taken at the Scripps Institution of Oceanography pier (La Jolla) since 1920 (the longest consistent data available) reveal remarkable long-term trends that likely occurred in similar fashion in the Study Area (Figure 3.2-4). Notably, the 32-year period from 1944 to 1975 was characterized by cooler than average temperatures, except for the 1957 to 1959 El Niño years. In contrast, the 23-year period from 1976 to 1998 has been warmer than the 78-year mean, with a few minor exceptions. These long term phases in water temperatures correlate with the Pacific Decadal Oscillation (PDO), which is a pattern of Pacific climate variability that shifts phases on inter-decadal time scales, and is detected by warm or cool surface waters in the north Pacific Ocean (Miller and Schneider 2000).



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MONTHLY MEAN SEA SURFACE TEMPERATURE IN THE SOUTHERN CALIFORNIA BIGHT

Figure 3.2-3 Monthly Mean Sea Surface Temperatures in the Southern California Bight

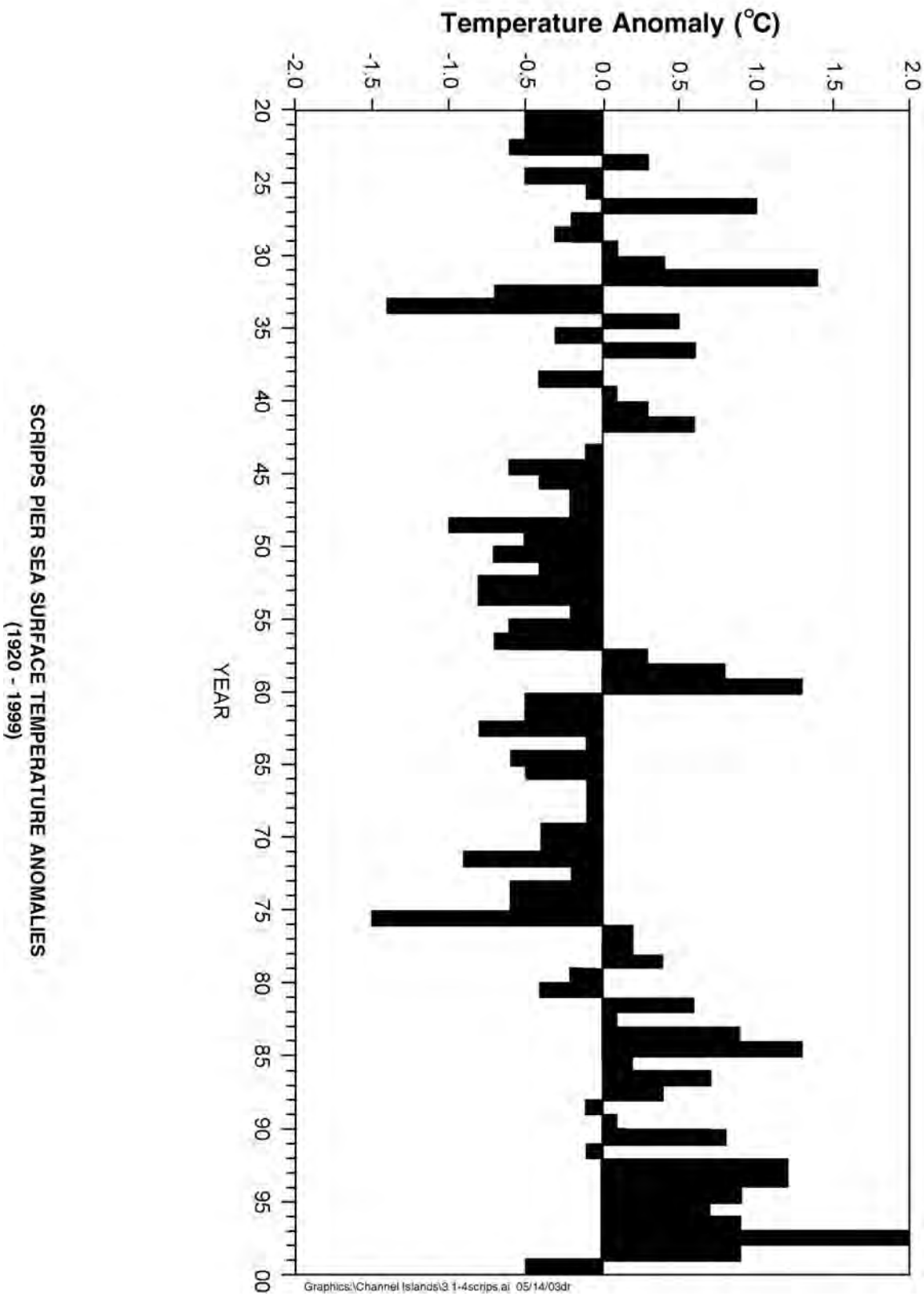

Figure 3.2-4 Scripps Pier Sea Surface Temperature Anomalies

The recent multi-decade, warm-water trend, consistent with the positive phase of PDO, helps explain key community changes documented at the Channel Islands during the 1980s and 1990s, including increased numbers of southern species at the northwestern islands, "disease" epidemics, other die-offs, and sea urchin overgrazing phenomena. The peak 1997–1998 El Niño was immediately followed by cold La Niña conditions in 1999 and lasted thru 2002. The water trend shifted once again in 2002 to a warm water phase and has remained through 2006 (Goericke *et al*. 2005).

3.2.3.4 El Niño/La Niña

Environmental fluctuation is an important factor influencing the distribution and abundance of marine life of the northern Channel Islands. In the SCB, El Niño and La Niña contribute to environmental fluctuation. El Niño is characterized by a large-scale weakening of the trade winds and warming of the surface layers in the eastern and central equatorial Pacific Ocean. El Niño events occur irregularly at intervals of 2 to 7 years, although the average is about once every 3 to 4 years. They typically last 12 to 18 months and are accompanied by swings in the Southern Oscillation (SO), an interannual see-saw in tropical sea level pressure between the eastern and western hemispheres. During El Niño, unusually high atmospheric sea level pressures develop in the western tropical Pacific and Indian Ocean regions, and unusually low sea level pressures develop in the southeastern tropical Pacific. SO tendencies for unusually low pressures west of the date line and high pressures east of the date line have also been linked to periods of anomalously cold equatorial Pacific SSTs sometimes referred to as La Niña.

Strong El Niño influences, which begin off South America, can eventually influence the climate, resources, and biodiversity of California's marine and coastal environment (Norton *et al*. 1985). A "California El Niño" is characterized by warm sea surface temperatures, a deeper surface mixed layer, a depressed thermocline, nutrient-poor water, greater poleward flow, and an anomalous high sea level (Barber and Chavez 1983; Dayton and Tegner 1990; North *et al*. 1993; Tegner and Dayton 1987). El Niño impacts forests of giant kelp in California in a variety of ways that result in little or no canopy being produced, depending upon the severity of the event. Such impacts also affect kelp forest population dynamics, succession, and competitive interactions among kelp forest species (Tegner *et al*. 1997).

The impact in California depends on the strength of the event. Mild El Niños, which can slow kelp growth, were felt along the coast of California during 1977–1978 and 1992–1993 and most recently in 2002 - 2003. Especially strong events impacted kelp resources and stopped commercial kelp harvesting off California in 1941, 1957–1959, and 1982–1984. The 1982–1984 El Niño was the largest ever recorded off South America and California (Rasmusson 1984).

Storms associated with the 1982–1984 El Niño also devastated kelp beds throughout California. The effects of this El Niño on giant kelp in southern California were studied by Gerard (1982), Dayton *et al.* (1984), Zimmerman and Robertson (1985), Dean and Deysher (1983), Tegner and Dayton (1987, 1991), and North *et al*. (1993).

Zimmerman and Robertson studied the giant kelp forest at Santa Catalina Island during the 1982–1984 El Niño. They found that deepened isotherms associated with the El Niño resulted in severe nutrient limitation and very low kelp productivity. Frond growth rates were so low that terminal blades formed before the frond reached the surface, eliminating canopy formation. Frond initiation rates were extremely low and resulted in significant reductions in mean plant size. Plants growing above 33 feet were more severely affected by the nutrient limitation than plants growing at 66 feet. These results suggested that nutrient pulses associated with internal waves were critical for survival of giant kelp in nutritionally marginal habitats in southern California (Zimmerman and Robertson 1985).

The relative growth rates of juvenile giant kelp in southern California were substantially reduced during the 1982–1984 El Niño (Dean and Deysher 1983). The lower growth rates were correlated with increased temperature and decreased nitrogen availability. Fertilization of juvenile plants with slow-release nitrogen-phosphorus fertilizer increased their growth rate to levels previously observed when the temperature was low and nutrient levels were high (Dean and Deysher 1983). The limitation in growth of juvenile giant kelp by levels of available nutrients during the El Niño was in contrast to the usual limitation in growth by irradiance during non–El Niño years. There was a shift in the relative importance of factors controlling growth of juvenile *Macrocystis pyrifera* during the El Niño (Dean and Deysher 1983).

Large-scale, low frequency oceanographic phenomena, such as El Niño or La Niña, play a very important role in kelp forest successional processes, population dynamics, and competitive interactions with understory kelps (Tegner *et al.* 1997). El Niño can drastically reduce the standing crop and canopies of giant kelp in California, resulting in a cessation or reduction of kelp harvesting for many months. Aquaculture, algin, and herring roe-on-kelp industries can all be severely impacted by significant El Niño events in California.

Environmental variations are important contributors to the unexplained distribution of many kinds of fish and shellfish. Consequently, the fishing of and reproductive success of some species are affected by environmental conditions, one of which is water temperature (Radovich 1961).

The effects of water temperature on California's marine flora and fauna can be both beneficial and detrimental. Ocean temperature directly affects the metabolism and survival of adult fish, and the abundance and type of food available. El Niño events have had dramatic effects on the flow patterns of the SCB (Chelton *et al.* 1982). Changes in the flow patterns as well as the resultant changes in rain and weather patterns associated with El Niño have been shown to have a number of biological impacts:

- Population shifts in commercially harvested species, such as squid, rockfish, and lobster;
- Transport of enormous volumes of sediments and suspended materials from the mainland to coastal and offshore waters; and
- Disturbance to critical marine habitats, notably storm and water temperature damage to kelp forests.

El Niño events cause proportional reductions in the growth and reproductive success of organisms within coastal ecosystems. Warm waters and the intrusion of a different water mass associated with El Niño events may change the abundance, species composition, and temporal dynamics of the prey community in local species assemblages. Depending on the nature of an organism's diet and patterns of energy storage and mobilization for reproduction, adult condition and spawning efforts may be adversely affected. Starvation and thermal stress may have direct physiological effects on fecundity, timing of spawning, and egg viability in both fishes and invertebrates, especially if they are sedentary or limited-range species (Bailey and Incze 1985; Barber and Chavez 1983).

It is important to note that marine organisms of the CINMS Study Area adapt within this ecosystem and have developed strategies which allow them to recover under natural conditions (Tegner and Dayton 1987). Some stocks, such as herring, are adapted to living in an environmentally variable coastal zone (Bailey and Incze 1985). Birds and pinnipeds are known to abandon their young so that the adults may use available food for their own survival (Barber and Chavez 1983).

However, the ability of a particular species to recover may be reduced if the El Niño event is particularly severe or prolonged. Early life history stages of organisms are especially vulnerable to the effects of warm waters, altered food production, and changes in transport regimes (Bailey and Incze 1985).

Overexploitation of a particular species may further hamper or prevent recovery (Cushing 1982). Overfishing may cause recruitment failure by either reducing the abundance of certain key species within an ecosystem, or by reducing the adult population size. Consecutive years of poor recruitment increases the likelihood of a total population collapse (CINMS 2001).

Highly migratory or mobile species may be able to avoid the warm El Niño conditions by either migrating further north or into deeper waters. However, bioenergetic costs associated with migration may pre-empt somatic growth and/or gonadal development. Fecundity, timing of spawning, and egg viability may be adversely affected by the weakened condition of adults (Bailey and Incze 1985).

Migration to cooler waters may present opportunities to expand a species' range by colonizing new areas. Successful colonization will depend upon the species' ability to cope with local dynamics like the timing of plankton blooms and current patterns, new interspecific interactions, such as competition and predator-prey relationships, and local conditions once the El Niño conditions subside (Bailey and Incze 1985).

Species more commonly found in tropical waters may migrate to, or be advected into, temperate waters during El Niño events (Squire 1983). For example, red crabs (*Pleuroncodes planipes*), pelagic tunicates, and fishes such as albacore, barracuda, dorado, yellowfin tuna, marlin, and triggerfish have been noted to occur far to the north of their usual range. In general, highly migratory species like yellowtail and some pelagic species such as barracuda and sardines thrive during warm water events. In the case of barracuda and yellowtail, these fish move north into Californian waters in response to the movement of warm water from the south. Sardines spawn when the water temperature is above 55.4 degrees Fahrenheit (13 degrees C). Higher water temperatures probably enhance the reproductive success of sardines. The arrival of new species may introduce new interspecific reactions that may alter the local community structure (Bailey and Incze 1985).

The displacement of species during El Niño events is reflected in depressed commercial catches of temperate-water species such as salmon, northern anchovy, lingcod, sablefish, rockfishes, dungeness crab, market squid, and shrimp (Smith 1985). During El Niño events, cold water species such as anchovy and salmon suffer declines. For anchovies, a warm water event merely signals the lack of preferred food such as plankton. Salmon, however, cannot metabolically withstand substantial increases in water temperature. Thus they will move away from areas of warm water. For those species at or near the bottom of the food chain, such as algae and lower invertebrates, the cessation of upwelling can be fatal. The dependence of these species on the nutrients found in cool upwelled water is well documented (Barber *et al*. 1985; Smith 1985). When the nutrients are depleted, the resulting mortalities and their effects can be felt all along the food chain (Barber *et al*. 1985).

Strong El Niño events are highly correlated with severe storms (Tegner and Dayton 1987). The community structure of kelp forests and other benthic habitats may be significantly altered following storm-induced disturbances. Recovery of plants damaged by storms may be hindered by the warm, nutrient-poor water associated with El Niño events.

3.2.3.5 Temperature Regime Shift

Recent data from extracted cores from the Santa Barbara Channel includes high quality information that can be tracked in increments of close to 50 years. The cores show rapid and extreme shifts in water temperatures during the last 60,000 years (Cannariato and Kennett 1999). These extreme shifts in water

temperature are one indication of regime shifts in the marine ecosystems of the CINMS and the SCB. As described earlier, climatic changes from natural and human causes are likely to produce major marine ecosystem disruptions or regime shifts. Regime shifts reflect significant changes in water temperature and in the currents of marine ecosystems (Steele 1998). Changes in water temperature can contribute to changes in the abundance and distribution of marine life and the general spatio-temporal character of marine habitats (McGowan *et al*. 1998).

Marine scientific evidence points to a large-scale persistent biological response to the climate regime shift in the California Current. CalCOFI investigators and others show that large-scale changes, or what is referred to as a regime shift, in the physical and biological processes can lead to change in the distribution and abundance of some marine species. Each regime shift changes the basic nature of marine ecology for several decades at a time (or on the order of several human generations). McGowan *et al.* (1998) state that the last regime shift occurred in 1977. General characteristics of regime disturbance, along with the current low-nutrient regime of the SCB, are described further below in section 3.3, Biological Environment. It is important to note that despite regime shifts, Cannariato *et al.* (1999) show there has been no extinction of benthic species in the Santa Barbara Channel. This is an important finding given that a number of benthic species have recently declined to the point of being listed as threatened under the federal Endangered Species Act.

3.3 BIOLOGICAL ENVIRONMENT

3.3.1 Bioregions

The confluence of the California Current and the Southern California Countercurrent has been shown to affect the abundance and distribution of marine species (Dailey *et al.* 1993). Murray and Littler (1981) define five distinct biogeographic units across the SCB based on analyses of 21 sites, which are influenced by ocean temperatures. The Study Area coincides with two biogeographic provinces, or biogregions (areas characterized by distinct patterns of species abundance and distribution) and a transition zone: (1) the colder water Oregonian Province, (2) the warmer water Californian Province, and (3) a transition zone between the two. Point Conception is often identified as marking the transition between the Oregonian and Californian Provinces (Horn and Allen 1978; Murray and Bray 1993; Murray and Littler 1981). However, changes in the bioregion boundaries are influenced by hydrographic conditions of the SCB and climate perturbation (Murray and Bray 1993; Murray and Littler 1981; Seapy and Littler 1980). San Miguel Island, Santa Rosa Island, and part of northern Santa Cruz Island typically lie in the colder waters of the Oregonian Province while Anacapa Island and the east end of Santa Cruz Island are typically in the warmer Californian Province. The southern side of Santa Rosa Island and Santa Cruz Islands as well as Santa Barbara Island are generally in the transition zone (Horn and Allen 1978).

Numerous studies support the distinctions between the bioregions. Murray and Littler (1981) show that the marine flora of the island sites near the California Current (San Miguel and Santa Rosa Islands) had much greater likeness to flora north of Point Conception than did the flora bathed principally by the Southern California Countercurrent or those of mixed waters. Other studies of species distribution patterns also suggest the presence of two primary faunal regimes. California fish fauna assemblages may be classified into two groups: those associated with cold-water masses and those associated with warm-water masses (Horn and Allen 1978). Earlier studies by Fitch (1967) of Pleistocene fossil fishes in southern California support the premise that these faunal regimes were consistent through time. Studies of the distribution patterns of shallow water benthic mollusks (Valentine 1966), rocky intertidal assemblages (Kanter 1980; Littler 1980; Murray *et al.* 1980), kelp-bed fishes off the Santa Barbara coast (Ebeling *et al.* 1980), and sandy beaches of the region, including the mainland (Dugan *et al.* 1999), show

distinct but interrelated bioregions. For example, because most nearshore fishes, invertebrates, and macroalgae have planktonic phases in their life histories, the spatial and temporal variability of their recruitment is linked to physical oceanographic processes, such as currents, eddies, and upwelling (Roughgarden *et al.* 1988).

3.3.2 Biotic Communities

3.3.2.1 Introduction

A biotic community is defined by the species occupying a particular locality and the interactions between those species. In turn, a biotic community coupled with its associated physical environment is considered an ecosystem. A fundamental way biological communities organize themselves is by food webs. A food web must have primary producers to capture energy from the sun (algae, phytoplankton, vascular plants), a means of energy transfer by feeding, and nutrient cycling between biotic and abiotic environment by excretion, bacteria, fungi, and detritus to provide nutrients back to primary producers. The different habitats of the CINMS are linked by these nutrient cycles and food webs (Dailey *et al*. 1993). Figure 3.3-1 depicts a simplified food web showing linkages between sea lions and other marine life, including fishes, in the CINMS.

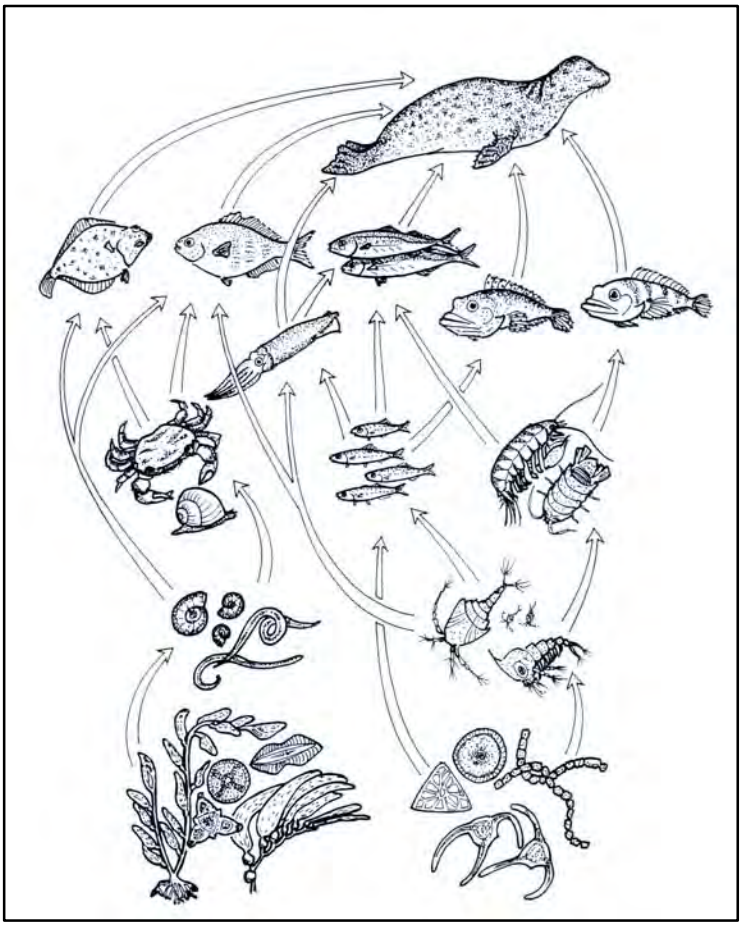

Figure 3.3-1 Simplified Food Web
Source: U.S. Navy 2000.

As tides and currents move water among the habitats, dissolved and particulate organic matter and nutrients also flow among the diverse habitat areas. Marine organisms from fish and invertebrates to seabirds and marine mammals also move among different habitat areas.

3.3.2.2 Habitats Within the Study Area

The Sanctuary contains many important and varied physical and geological features including a complex of plateaus, continental slope, gyres, banks, subsea canyons and rocky reefs. The diversity of accentuated bottom relief, abrupt change in depth, and varied substrate provide a spectrum of marine habitats. In summary, the primary habitats found within the study area include kelp forests, surfgrass and eelgrass beds, rocky and sandy intertidal, rocky and sandy nearshore subtidal, deep-water benthic, and pelagic habitats. A detailed discussion of study area habitats is provided in Appendix C, section 1.1, of this FEIS.

Kelp Forests Kelp forests in the Sanctuary are highly productive habitats that provide food, attachment sites, and shelter for myriad invertebrates and fishes. 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.

Surfgrass and Eelgrass Surfgrass and eelgrass beds are also highly productive and complex microhabitats that support a wide variety of marine species. 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.

Intertidal The intertidal zone comprises a variety of coastal habitats periodically covered and uncovered by waves and tides. 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). A wide variety of sedentary invertebrates, including barnacles, limpets, and mussels compete for space with the plants in the intertidal zone which also provides important habitat for fish, seabirds, seal and sea lions.

Nearshore Subtidal Nearshore subtidal habitats include mud, sand, gravel, cobble, and bedrock substrates. 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. Many sandy nearshore habitats in the Sanctuary have relatively steep slopes composed of coarse shell 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.

Deep-Water Benthic 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). In addition, deep rock bottoms are often 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.

Pelagic 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. Water column habitats within the majority of the Sanctuary do not extend deeper than the mesopelagic zone (from approximately 660 to 3,300 feet), 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 (from approximately 3,300 to 11,500 feet).

3.3.2.3 Floral and Faunal Assemblages in the Study Area

The Sanctuary's oceanographic and physical features support a great diversity of marine species, many of which are extremely rare and afforded special protection by federal and state law. A detailed description of floral and faunal assemblages in the Study Area is provided in Appendix C, section 1.2, of this FEIS.

Plankton Plankton, single celled pelagic 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). Giant kelp, surfgrass and eelgrass are marine plants that provide important habitat to numerous other species within the Study Area. In particular giant kelp forests are conspicuous features of the Sanctuary and important not only ecologically, but also recreationally and commercially.

Invertebrates The Channel Islands support a wide variety of invertebrates due to their transitional location between cold and warm bioregions and diversity of substrates. The total number of species may well be in excess of 5,000, not including microinvertebrates (Smith and Carlton 1975: Straughan and Klink 1980). Marine invertebrates may be benthic (bottom-dwellers) or pelagic, and may range in size from little known microscopic forms (micro-invertebrates) to the more common larger organisms (macro-invertebrates). 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 ESA. Within the Sanctuary highly valuable commercial fisheries for squid, sea urchin, and lobster occur.

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. Select fishes commonly found in the Sanctuary include: albacore, anchovy (northern), bass (various species), cabezon, California sheephead, California halibut, garibaldi, rockfish (various species), salmon (king), sardine (Pacific), shark (various species), surfperch (various species), swordfish, and white sea bass.

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 that for the Channel Islands area 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 Endangered Species Act (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 that have 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, Xantus's murrelet.

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. 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 section 1.2.7.4 of Appendix C within this FEIS. At least 33 species of cetaceans have been reported in the Sanctuary region (Leatherwood *et al*. 1982; Leatherwood *et al*. 1987). 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. Historically seven species of pinnipeds have been found throughout or in part of the Sanctuary: the California sea lion (common), northern fur seal (uncommon), northern elephant seal (common), Pacific harbor seal (common), Guadalupe fur seal (rare), Steller sea lions (extremely rare), and ribbon seal (extremely rare). The productive waters and relatively undisturbed environment of the Sanctuary provides vital habitat for these pinniped species, offering important feeding areas, breeding sites, and haul outs. Finally, 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. 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 reported (USFWS 2005). Following the translocation, there have been few sightings of sea otters in the Sanctuary (USFWS 2005). Sea otters are not expected to have any effect on CINMS resources within 10 years, and have yet to recolonize areas within the Sanctuary (USFWS 2005: 113). Information about termination of the translocation program is provided in the FMP's (Vol. I) Resource Protection Action Plan.

3.3.2.4 Status of Biotic Communities in the Study Area

Communities and ecosystems do not have a preset optimal level to which they invariably return (Noss 1995). These composite biological structures are different from homeostatic systems. When a limit of tolerance, for example, in a marine ecosystem is reached, the ecosystem does not die. Instead, the system reaches a different state with different operating conditions, processes, and ecological structures. The ecosystem's response to ecological disturbance refers to the capacity of an ecosystem to withstand stress and environmental fluctuation. The system possesses integrity if it retains the ability to continue its ongoing change and productive development (Noss 1995).

Scientific evidence shows that ecosystems in the Sanctuary and Study Area are disturbed (CDFG 2002). Based on an analysis of CalCOFI data, Roemmich and McGowan (1995a,b) document large-scale changes in primary and secondary productivity throughout the SCB between 1951 and 1993. Note that this long-term trend in the decline in ecological productivity pre-dates the 1977 warm-water and low-nutrient regime change (discussed above in 3.2.3.5). This evidence suggests that the maintenance of community structure and patterns of native species diversity has changed in accordance with hydrographic perturbations and climate-ocean variability (Hayward *et al*. 1996; McGowan *et al*. 1998).

Figure 3.3-2 illustrates an example of ecosystem relationships and the complexity of physical, ecological, and human interactions that influence the abundance and distribution of birds, which are indicator species of the health and integrity of coastal marine ecosystems.

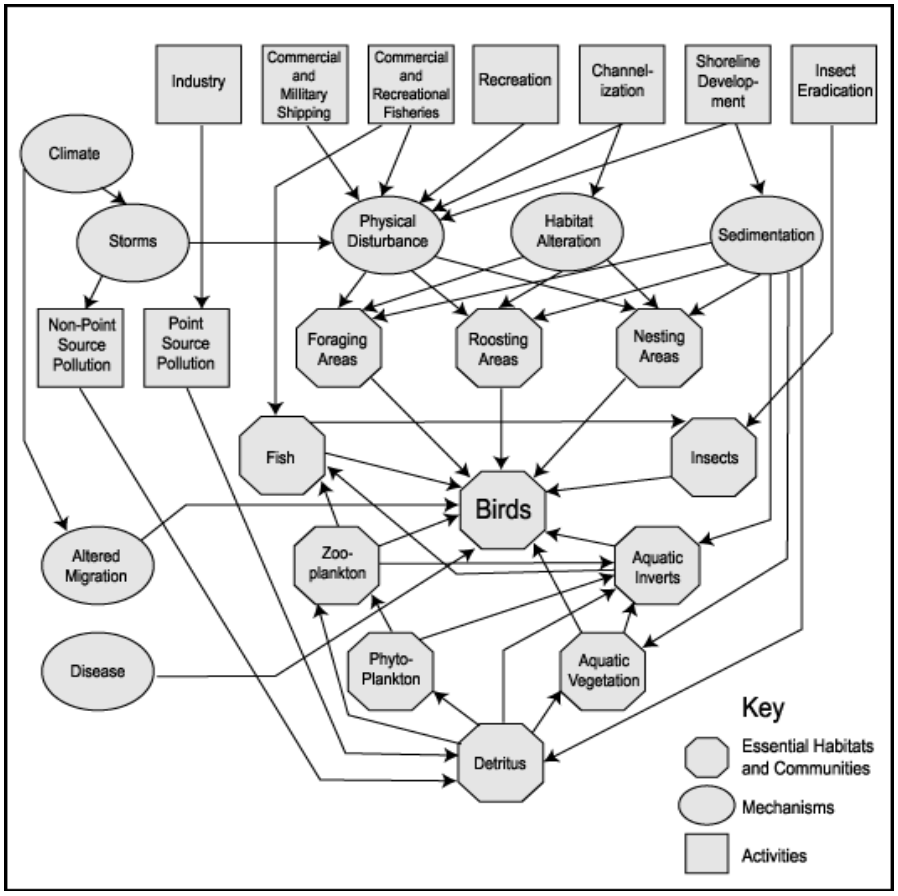

Figure 3.3-2. Activities, Mechanisms, Habitats, and Communities Affecting Coastal Birds
Source: U.S. Navy 2000

A summary of large-scale changes in the SCB as described by marine scientists follows (CDFG 2002; McGinnis 2000):

The Photic Zone Smith and Kaufmann (1994) show a long-term deficit in the supply of food necessary to meet the metabolic demands of the sediment community. The long-term increase in sea surface and upper water column temperatures and physical stratification in the system has resulted in a lower rate of supply of nutrients to the photic zone (the upper zone of sunlight of the sea, less than 120 meters thick). This has lead to a decrease in productivity and a general decline of zooplankton and other species (*e.g.*, larval fish production, seabirds, kelp production, and a shift in benthic, intertidal community structure). Despite this decline in food supply, the food demand of the deep-benthic sea community remains constant. With the demand on food constant, and the supply diminishing, a net deficit in available food occurs (CDFG 2002).

Macrozooplankton Since the late 1970s, macrozooplankton volume in the California Current has declined over 70 percent, in concert with increasing sea surface temperatures (McGowan *et al*. 1998; Roemmich and McGowan 1995a,b). Reduced macrozooplankton has a major impact at higher trophic levels by changing the nature of the food supply.

Fishes and Invertebrates CDFG data show decreases in landings for several categories of groundfish, sea urchin, selected shark species, Pacific mackerel, Pacific herring, selected flatfish, and market squid between 1999 and 2003 among others (Leeworthy *et al*. 2005). Dugan and Davis (1993) document the general decline in long-term productivity in 19 species of nearshore fishes and invertebrates in California from 1947 to 1986. A study by Love *et al*. (1999) of long-term trends in the SCB commercial rockfish fishery shows a substantial decline from 1980 to 1996, with extremely low catches from 1993 to 1996. In addition, the estimated abundance in streams south of Point Conception for southern steelhead (*Oncorhynchus mykiss*) are probably only on the order of 100 to 300 adults (Pacific Fishery Management Council [PFMC] 1996).

Oceanic Birds Ecological theory predicts that in a stable ecosystem those species occupying high trophic levels maintain native species diversity and community structure (Paine 1966). Upper trophic level animals such as pelagic birds are indicators of the health of the marine environment (Veit *et al*. 1996). Evidence suggests the abundance of oceanic birds in the region and the SCB has declined steadily since 1988 (Veit *et al*. 1996, 1997). For example, numbers of the sooty shearwater, the most abundant bird in the SCB, have declined by 90 percent. Veit *et al.* (1996) show that the decline in bird biomass reflects considerable biological change within the California Current system. Veit *et al*. (1996, 1997) indicate that ocean warming and climatic events change pelagic bird abundance within the California Current system.

Southern California Kelp Tegner *et al*. (1997) show a two-thirds reduction in standing biomass since 1957 in southern California kelp forests. Moreover, Tegner *et al*. (1996, 1997), Tegner and Dayton (1991), and Dayton *et al*. (1992) show that kelp forests have suffered great damage since the 1970s.

Global Climate Change Another large-scale change lies in the increasing frequency of climatic events (McGowan *et al*. 1998).

Marine ecosystem disturbance affects the abundance and distribution of native marine species associated with the Study Area. Further, several species listed as threatened or endangered depend on Sanctuary ecosystems. Many of these species are indicators of ecosystem health. A detailed description of the major biological resources of the CINMS marine ecosystems (specific habitat types and species descriptions, including special-status species) is included as Appendix C of this FEIS and also found in *Marine Protected Areas in NOAA's Channel Islands National Marine Sanctuary – Final Environmental Document* (2002), available on line at http://www.dfg.ca.gov/mrd/ci_ceqa/index.html.

3.3.3 Coastal Watersheds

There are 24 major drainage systems within the 32,000 square km of the SCB (Saint *et al.* 1996). Of these, 53 percent of the drainage area is controlled by major water retention structures, such as dams and reservoirs.

Freshwater input to the majority of the Study Area is derived from the streams and rivers draining the Transverse Ranges. Two rivers, the Santa Clara River and the Ventura River, drain the eastern portion of the range and provide the majority of the sedimentary input along the southern coastline (Dailey *et al* 1993; Norris and Webb 1990). The Santa Clara River drains most of southern and central Ventura County and is the largest drainage system in the Transverse Ranges (Norris and Webb 1990). The Santa Clara River extends approximately 75 miles and has been extensively used for urban and agricultural water supplies (Norris and Webb 1990). The Santa Ynez and Santa Maria Rivers provide major drainages north of Point Conception. The 60-mile-long Santa Ynez River drains the north-facing slopes of the Santa Ynez Mountains and the southernmost Coast Ranges. The Santa Maria River System, which

includes the Cuyama and Sisquoc Rivers, drains the San Rafael and Sierra Madre Mountains of northern Santa Barbara County. Table 3.3-1 describes the major watersheds in the Study Area.

Table 3.3-1. Major Watersheds of the CINMS Study Area[1]

Watershed Name	Counties in Watershed	Watershed Area in Square Miles	Watershed Land Use (in order of decreasing area)[1]	Annual Mean Discharge in acre - feet (recording period)
Santa Maria River System (includes Cuyama and Sisquoc Rivers)	San Luis Obispo Santa Barbara Ventura	1,826[3]	National forest/wilderness Agriculture Urban	133,500 (1944-1994)[3]
San Antonio Creek	Santa Barbara	135[2]	Military reservation Agriculture Urban	4,420[2] (1956-1996)
Santa Ynez River	Santa Barbara	789[2]	National forest Agriculture Military reservation Urban	80,700[2] (1952-1996)
Santa Barbara Coastal (41 creeks)	Santa Barbara Ventura	375[4]	National forest Agriculture Urban	Not available
Ventura River	Santa Barbara Ventura	188[2]	National forest/wilderness Agriculture Urban	47,670[2] (1960-1996)
Santa Clara River	Santa Barbara Ventura Los Angeles	1,577[2]	National forest/wilderness Agriculture Urban	121,200[2] (1928-1996)

Data Sources:

1 McGinnis (2001).

2 Watershed area and annual mean discharge obtained from U.S. Geological Survey 1996 California Hydrologic Data Report (http://water.wr.usgs.gov/data/96), for the farthest downstream gauging station recorded on each watershed. Note that the recording period is not the same for all stations. No data was available in the 1996 report for the Santa Maria River or the Santa Barbara Coastal watersheds.

3 Watershed area and discharge data for Santa Maria River System obtained from Bateni and Turner, State of California Department of Water Resources Draft Natural Flow, Santa Maria River 1997.

4 Watershed areas obtained from California Rivers Assessment (CARA) 1997. http://endeavor.des.ucdavis.edu.

The coastal mainland of the Study Area also includes the San Antonio Creek watershed and 34 small coastal watersheds draining the south side of the Santa Ynez Mountains (NPS 2003b). The creeks of these watersheds provide important nutrients to the marine environment but can also carry pollution from agricultural and urban runoff.

3.3.4 Coastal Processes

In the SCB, coastal processes physically link watersheds to wetlands via the delivery of water, sediment, and nutrients to the wetland from the watershed (Dailey *et al*. 1993; NPS 2003b). A characterization of coastal ecosystems of southern California is depicted in *Making the Watershed Connection: Wetlands,*

Watersheds and Regional Planning Efforts of the South Coast (McGinnis 2001) and by the California Coastal Conservancy (2001).

Within a particular geologic context, water, sediment, and nutrients from the watershed define the type of coastal wetland that emerges (Ferren *et al*. 1995). Wetlands in southern California occur in various ecosystem contexts (*e.g.*, lagoons, rivers, lakes, ponds), but have origins related to several major physical processes. Wetlands that develop as a result of fluvial processes occur in riparian corridors, such as along the Santa Clara River. Here, riverine and palustrine wetlands occur in proximity to estuarine and marine wetlands when a river reaches the coast, and tidally influenced water regimes bearing ocean-derived salts meet waters and habitats of continental origin.

Several special-status species are found in the CINMS that also depend on the wetlands of the coastal mainland, such as Mugu Lagoon (California Coastal Conservancy 2001). 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 (NPS 2003b). These coastal wetlands are recognized as a "significant biological resource" (Zedler 1982) and "environmentally sensitive habitat" (Santa Barbara County Coastal Plan 1982).

The wetland at Skunk Point, located on Santa Rosa Island is considered to be one of the healthiest remaining in Southern California (Davis 2000).

3.3.5 Regulatory Setting

3.3.5.1 Federal

U.S. Fish and Wildlife Service

There are several laws utilized by the U.S. Fish and Wildlife Service (USFWS) in managing marine and coastal resources. The U.S. Fish and Wildlife Coordination Act gives the USFWS the power to review and comment on federal actions that affect many habitat-related issues, including wetlands and waters protected under the Federal Water Pollution Control Act and Rivers and Harbors Act.

The federal Endangered Species Act (ESA) allows the USFWS to regulate, monitor, and implement programs for protecting the ecosystems upon which fishes, wildlife, and habitat of listed species depend. The ESA also helps enforcement of international treaties and conventions related to species facing extinction.

The federal Migratory Bird Treat Act (MBTA) allows the agency to enforce the prohibition against the taking of migratory birds, their eggs, or their nests. The USFWS has sole authority for coordinating and supervising all federal migratory bird management activities, including enforcement of federal migratory bird statutes regulating the taking of federally protected species (game and non-game) by individuals and federal agencies. The MBTA provides the USFWS opportunity to comment on projects potentially affecting bird species, and their habitats that are not protected under the ESA.

USFWS also has authority to enforce portions of the Marine Mammal Protection Act that deal with sea otters, as well as species not found in the Study Area including walrus and polar bears.

NMFS

The Magnuson-Stevens Fishery Conservation and Management Act authorizes the National Marine Fisheries Service (NMFS) to maintain and conserve fisheries and rebuild overfished stocks. NMFS is also responsible for determining whether projects or activities may adversely impact Essential Fish Habitat zones (those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity) and consulting with project or activity proponents to mitigate for or minimize adverse impacts.

The NMFS Office of Protected Resources (OPR) is charged with the implementation of the MMPA, ESA, and the Fur Seal Act with respect to marine mammal species under NMFS' jurisdiction, including whales, dolphins, porpoises, seals, and sea lions. As part of the MMPA mandate, OPR works in collaboration with the Protected Resources Divisions of the NMFS Regional Offices and Science Centers to develop and implement a variety of programs for the protection, conservation, and recovery of marine mammals. OPR also establishes cooperative agreements with states and Alaska Natives regarding marine mammal resources, identifies important research needs to collect appropriate information for management decisions, and administers the activities of the Marine Mammal Health and Stranding Response Program.

In addition, OPR serves as the principal liaison for NMFS with the Marine Mammal Commission, environmental organizations, industry, other federal and state agencies (including USFWS and the Animal and Plant Health Inspection Service), the academic community, public display institutions, and environmental and animal welfare organizations to meet its mandates under the MMPA. The OPR also administers the national program for display of captive whales, dolphins, porpoises, seals, and sea lions, coordinates with the USFWS on issues concerning the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), and administers various exemptions to the take prohibition under the MMPA for the activities below:

- Scientific research;
- Enhancing the survival or recovery of a marine mammal species or stock;
- Commercial and educational photography;
- First-time import for public display;
- Capture of wild marine mammals for public display;
- Incidental take during commercial fishery activities; and
- Incidental take during non-fishery activities.

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.

3.3.5.2 State

California Department of Fish and Game

The CDFG administers the California Endangered Species Act and manages sport and commercial fish, wildlife, and aquaculture.

The CDFG regulates the "take" or "possession" of species protected under the California Endangered Species Act and other species under the California Fish and Game Code (*e.g.*, for fishing and hunting). Seabirds taken in Department-managed hunting programs, for example, include various species of sea ducks. CDFG also continues to be actively involved in restoration and recovery of some native seabird species and other species on the islands.

An established state (CDFG) and federally (USFWS and NMFS) coordinated permit system ensures compliance with numerous applicable state and federal laws affecting the take and possession of other seabirds. Under the provisions of a Memorandum of Understanding with the USFWS, the CDFG may issue scientific collecting permits for various scientific endeavors that advance the conservation interest of seabird resources. In addition, numerous other activities involving the taking or possessing of marine mammals, sea turtles, and seabirds are currently allowed under the California Fish and Game Code, including collection of carcasses for wildlife disease studies, studies of the effects of fishing (bycatch), food habit studies, pollution studies, museum collections, and others. Permitted individuals include agency personnel and designated agents of the agencies, including volunteers.

Recent legislation and plans require that the CDFG develop and implement networks of marine protected areas, or MPAs, in California waters to protect habitats and preserve ecosystem integrity, among other things. Assembly Bill 993 (Shelley), the Marine Life Protection Act (MLPA), was introduced in February 1999 and chaptered in October 1999. The language is now included in Chapter 10.5 of the California Fish and Game Code, sections 2850–2863. Sponsored by the Natural Resources Defense Council, the bill was supported by conservation, diving, scientific, and educational groups. The purpose of the MLPA is to improve the array of MPAs existing in California waters through the adoption of a Marine Life Protection Program and a comprehensive master plan. The MLPA states that "marine life reserves" (defined as no-take areas) are essential elements of an MPA system because they "protect habitat and ecosystems, conserve biological diversity, provide a sanctuary for fish and other sea life, enhance recreational and educational opportunities, provide a reference point against which scientists can measure changes elsewhere in the marine environment, and may help rebuild depleted fisheries." The master plan requires that recommendations be made for a preferred alternative network of MPAs with "an improved marine life reserve component." The MLPA further states that "it is necessary to modify the existing collection of MPAs to ensure that they are designed and managed according to clear, conservation-based goals and guidelines that take full advantage of the multiple benefits that can be derived from the establishment of marine life reserves." The CDFG is the lead agency charged with implementing the provisions of the MLPA.

A second state law, the Marine Life Management Act (MLMA), enacted on January 1, 1999, establishes a fisheries management system and establishes fisheries management goals for CDFG. With respect to meeting the MLMA's primary goal of sustainability, the CDFG Commission adopted a Nearshore Fishery Management Plan (NFMP), which aims at preventing overfishing, rebuilding depressed stocks, ensuring conservation, and promoting habitat protection and restoration.

State Lands Commission

The California State Lands Commission has responsibility for managing state-owned sovereign lands for the benefit of all people of California for the public trust purposes of waterborne commerce, navigation, fisheries, water-related recreation, habitat preservation, and open space, among others. In that regard, the State Lands Commission is supportive of public trust uses consistent with and protective of the fragile resources of the state-owned sovereign lands.

The California State Lands Commission 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 3 nmi offshore. The State Lands Commission's policies for managing 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 State Lands Commission 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.

State Water Resources Control Board

The State Water Resources Control Board (State Water Board) has the primary responsibility to preserve and enhance California's coastal and ocean water quality through the development of water quality control plans and the issuance of waste discharge requirements (WDRs), which are required by the California Water Code. The State Water Board and Regional Water Quality Control Boards regulate a variety of activities that occur in watersheds that discharge or threaten to discharge to waters of the state, and activities that impact or have the potential to impact coastal resources, including biological resources. More information about the State Water Board and Regional Water Quality Control Boards is available under section 3.5.4.4 (the regulatory setting for contaminant sources).

3.4 MARITIME HERITAGE RESOURCES

The Sanctuary and Study Area contain a wealth of maritime heritage resources (MHRs) representing as much as 13,000 years of human history. MHRs consist of paleontological remains; prehistoric archaeological sites and their associated artifacts; shipwrecks; aircraft wrecks; and material associated with wharves, piers, and landings. For the purposes of this FEIS, this material is divided into two categories: cultural, consisting of Chumash Native American artifacts, and historical, consisting of artifacts from non-Native American cultures. Historical resources span the period from the time of Juan Rodriguez Cabrillo's voyage (1542 to 1543) to the present. In addition, 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. The discovery suggests a high probability of the existence of submerged paleontological remains within the Sanctuary. Collectively, MHRs of the Sanctuary represent a remarkable cross-section of our regional and national heritage. The following text provides an overview of cultural and historical resources in the Sanctuary and Study Area. A detailed characterization of these resources is provided in Appendix C of this FEIS.

3.4.1 Cultural Resources

Cultural resources found in the Sanctuary represent Chumash Native American cultures and date back to the end of the Pleistocene, approximately 13,000 years before present (B.P.). This is the date associated with the early human remains of a woman ("Arlington Springs Woman") discovered at Arlington Canyon on Santa Rosa Island.

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."

The abundance of prehistoric Chumash artifacts found in the Santa Barbara Channel attests to the thriving lifeways 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 (Howorth and Hudson 1993; Hudson 1976 and 1979; Hudson and Howorth 1985). 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. For more detailed information on cultural resources in the CINMS, see App. C, sec. 2.4.

3.4.2 Historical Resources

The historic period in the Study Area dates from early European exploration, starting with Juan Rodriguez Cabrillo's voyage (1542 to 1543). For hundreds of years, mariners transiting this region have been faced with prevailing winds, extreme weather conditions and natural hazards. An important trade route, the Manila galleon trade, transited this coastline from 1565 to 1815. Sailing east from the Philippines, these galleons would make landfall near Cape Mendocino, California, before sailing southward to Acapulco, Mexico (Wilcox 1991). The small settlement of Santa Barbara became an established coastal trading port during the Spanish (1769–1821) and Mexican occupations (1822–1846). Regional commerce included the hide and tallow trade. Alaskan Aleut Indians, working for the Russian and American fur companies, hunted seals and sea otters for their pelts in the Channel Islands from 1803 to the 1840s (Terrell 1995).

Shortly after American occupation, the 1849 Gold Rush gave rise to the single largest migration of people to California (Delgado 1990). A substantial increase in both steam and sailing ship activity passed through the Santa Barbara Channel during the Gold Rush.

United States Coast Survey teams (renamed the U.S. Coast and Geodetic Survey in 1878) were sent out from the east to the Channel Islands and along the California coast to chart safe anchorages and navigational hazards (Davidson 1858). California ports became a center for international trade, with Western and Eastern economies exploiting natural resources such as seals and whales. Chinese immigrants, working from California-built junks, established some of the earliest commercial fisheries in the Santa Barbara region (Bentz and Schwemmer 2000). From the twentieth century to present, commercial fisheries, commercial freight, military, recreational boating, and oil exploration dominated maritime activities.

Between 1853 and 1980, an inventory of over 140 shipwrecks and aircraft wrecks was documented in the area now encompassed by the CINMS. To date, about 20 of these sites have been located. Shipwrecks in the Study Area reveal the diverse range of activities and nationalities traversing the Santa Barbara Channel. They include California-built Chinese junks, American coastal traders, vessels engaged in island commerce, and Gold-Rush-era side-wheel steamers. Some examples in the CINMS include the *Comet* (a three-masted coastal lumber schooner that was run aground on San Miguel in 1911 after striking Wilson Rock) and the *Winfield Scott* (a Pacific Mail Steamship Company passenger steamer, which, at full speed, ran aground on Anacapa Island in 1853 with over 400 passengers onboard). The area's American and European shipwrecks depict a remarkable diversity in sail and steam propulsion.

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

In addition, the Study Area includes a number of land-associated underwater historical sites, both along the mainland shore and offshore islands, including submerged historic remains of landings and wharves. Submerged artifacts associated with vessel activities, spilled cargoes, and the pioneer oil industry may also exist. Documented settlements include Chute Landing 1880 (Point Sal Landing), Lompoc Landing (Purisima Point), Meherin Wharf (Surf), Wrecker's Wharf (Honda Creek), Sudden Wharf-Rancho Espada (Point Arguello), Lifeboat Station (Point Arguello), shore whaling site (Cojo), Gaviota Wharf, More's Landing (Goleta), Chapala Street Wharf and Stearns Wharf (Santa Barbara), Ventura Wharf, Carpinteria Wharf, and Hueneme Wharf. The offshore island sites include Prisoners Harbor Pier, Scorpion Ranch Pier (Santa Cruz Island), Anacapa Island Landing, Bechers Bay Pier, East Island Pier and Johnson's Lee Pier (Santa Rosa Island), and Cuyler Harbor Pier (San Miguel Island) (Lima 1994).

3.4.3 Regulatory Setting

Within the Study Area, state and federal agencies are mandated to protect historical resources. These agencies have various jurisdictional boundaries. As stated previously, the Sanctuary consists of an area of approximately 1,128 square nautical miles (nmi) off the southern coast of California. The Sanctuary boundary 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 boundaries of Channel Islands National Park include San Miguel and Prince Islands, Santa Rosa, Santa Cruz, Anacapa and Santa Barbara Islands, including the rocks, islets, submerged lands, and waters within one nautical mile of each island (16 U.S.C. 410(ff)). The state's jurisdiction extends 3 nmi off the California coast and islands. Also, several state ecological reserves exist within the Study Area; resources within these reserves have additional

protection. In addition, the MMS has guidelines to protect historical resources during offshore oil exploration in federal waters.

The protection of historical resources is provided through the following regulations, laws, and orders:

- CINMS regulations (15 CFR part 922, subpart G);
- The National Marine Sanctuaries Act (16 U.S.C. 1431 *et seq.*);
- CINP regulations (36 CFR parts 2 and 7, Resource Protection, Public Use and Recreation, and Special Regulations);
- Archaeological Resources Protection Act (16 U.S.C. 470aa *et seq.*);
- National Historic Preservation Act (16 U.S.C. 470 *et seq.*);
- Abandoned Shipwreck Act of 1987 (43 U.S.C. 2101 *et seq.*);
- Executive Order 11593 (1971);
- California Penal Code section 622.5: Objects of Archaeological or Historical Interest;
- California Administration Code, Title 14, section 630(a)(1), General Regulations for Ecological Reserves;
- California Public Law 100-298, implementing federal Abandoned Shipwreck Act; and
- California Native American Resource Protection Act of 2003, Chapter 1.76, Public Resources Code, section 5097.993-5097.996

The current CINMS regulations prohibit removing or damaging any historical or cultural resource. The NMSP is required to adhere to the Federal Archaeology Program, as established by the NHPA. Federal agencies with land management responsibilities for public lands (including NOAA) must inventory their holdings (section 110) and ensure mitigation of any federally funded activities that threaten historical and cultural resources on their holdings (section 106). In 1971, Executive Order 11593 required that all federal agencies create programs to facilitate the protection of cultural resources on their lands. To accomplish such tasks, agencies must have staff trained in archaeological methods and cultural resource management (Terrell 1995). The NPS also has a special provision under part 7, Resource Protection, Public Use and Recreation for the Channel Islands, 36 CFR 7.84 stating "(b) Wrecks. No person shall destroy, molest, remove, deface, displace, or tamper with wrecked and abandoned water or airborne craft or any cargo pertaining thereto."

The California Native American Resource Protection Act of 2003 states that it is a misdemeanor for any person to illegally excavate, destroy, injure, or deface a Native American historic, cultural, or sacred site, including any historic or prehistoric ruins, any burial ground, any archaeological or historic site, any inscriptions made by Native Americans at such a site, any archaeological or historic Native American rock art, or any archaeological or historic feature of a Native American historic, cultural, or sacred site. California has title to older abandoned shipwrecks in state waters through the Abandoned Shipwreck Act of 1987. In the case of modern shipwrecks, either the insurance underwriter, in the case of a total loss, or the registered owner has title to the wreck.

3.5 HUMAN USES

The focus of this section is to describe consumptive and non-consumptive human uses that relate to the regulatory changes presented in the Proposed Action and/or Alternative 1, described in section 2.0. Human behavior and activity on land and at sea can dramatically impact coastal marine ecosystems and associated species diversity. A great variety of human uses occurs in the Study Area. For example, the Channel Islands are close to harbors in Santa Barbara, Ventura, and Port Hueneme, as well as Channel Islands harbor in Oxnard. These harbors facilitate visitation to the Islands for numerous recreational and commercial activities. Human use of the Sanctuary is not limited to residents of the Santa Barbara Channel region. Almost 20 percent of those who use California's coastal areas for recreation, for instance, are interstate or international visitors (California Resources Agency 1997).

3.5.1 Oil and Gas

A comprehensive history of offshore oil and gas development in the Study Area is found in work produced by the University of California, Santa Barbara's Ocean and Coastal Policy Center (Lima 1994; Molotch 1999a, b, c). These studies show that offshore oil and gas development is typically dependent on onshore facilities. Current onshore facilities prepare crude oil for shipment to refining centers and process natural gas. A characterization of onshore facilities for offshore oil and gas activities is found in *Final California Offshore Oil and Gas Resources Study* (MMS 2000).

This section describes offshore oil and gas activities and their corresponding potential environmental impacts in four phases: (1) exploration, (2) development and production, (3) transfer of oil and/or gas to shore, and (4) platform decommissioning. For definitions of oil and gas terminology (*i.e.*, unit, and field), please refer to the glossary in FEIS section 10.

3.5.1.1 Offshore Oil Exploration

When an area of the ocean has been identified as having potential oil and gas reserves, geophysical surveys (primarily through the use of seismic technology) are carried out to "type" the geological formations beneath the seabed. If a seismic survey reveals oil or gas, then exploratory (or "delineation") drilling is carried out to test the limits or capacity of the field.

Environmental effects of exploratory drilling typically occur over 60 to 90 days (Klee 1999). Although exploratory drilling tends to be short-term, noise and pressure from seismic surveys may still affect the behavioral traits of various marine organisms, such as feeding, mating and avoiding predators. These effects tend to be more pronounced when drilling occurs during natural phenomena such as fish spawning or whale migrations (Klee 1999). A typical marine seismic survey consists of an airgun array, which generates the seismic pulses and hydrophones spaced along a streamer cable just below the surface of the water, which receive the reflected energy from the subsurface formations and transmit data to the vessel, where the data is collected (NOAA 1999a). Underwater sounds produced by seismic operations may be detectable some distance away from the activity. Typical behavior changes in marine mammals that can result from seismic activities include alterations in the surface-dive-respiration cycles, changes in activity or aerial displays, movement away from the sound source, or complete avoidance of the area (NOAA 1999a).

Offshore oil and gas exploration is currently prohibited within the CINMS under the existing regulations, except for leases executed prior to March 30, 1981. Existing leases within CINMS are discussed below in section 3.5.1.2.

Since 1995, several seismic surveys have been conducted off the Southern California coast. In 1995 Exxon completed a high-energy seismic survey that encompassed 16 leases and covered 117 square miles offshore of Santa Barbara County (County of Santa Barbara Energy Division 2003). This was the first high-energy survey to be completed offshore of Santa Barbara County since 1988.

3.5.1.2 Offshore Oil Development and Production

Federal Activities

Except for the majority of waters within the CINMS (and other National Marine Sanctuaries), no portion of the federal Outer Continental Shelf (OCS) has a permanent moratorium on oil and gas leasing and development (California Coastal Commission 1999). Temporary Congressional moratoria have been in place since 1982 (California Coastal Commission 1999). In addition to Congressional moratoria, the Bush (George H.W.) and Clinton administrations issued directives under the OCS Lands Act to restrict leasing of new offshore areas. In 1990, President Bush directed that all areas protected by Congressional moratoria be deferred for leasing consideration until after the year 2002. This deferral included the federal OCS offshore of California. In June 1998, President Clinton also issued a directive under the OCS Lands Act preventing the leasing of any area currently under moratorium for oil and gas exploration and development prior to June 30, 2012. However, these OCS "presidential deferrals" were reversible by subsequent administrations. In July 2008, President George W. Bush issued a memorandum to lift the executive prohibition on oil exploration in the OCS, but maintained the moratorium as it pertains to existing national marine sanctuaries.

Offshore oil and gas development has occurred in leased tracts in California waters from the mean high tide line to 3 miles offshore, and in federal waters from 3 to 11 miles offshore. Table 3.5-1 depicts federal offshore oil and gas fields, operators, platforms, installation dates, and platform depths. Figure 3.5-1 depicts the federal offshore oil and gas leases within the Study Area.

Twenty platforms, one island (Rincon Island), and approximately 180 miles of associated pipelines are located in the Study Area. A total of 19 platforms are in federal waters; 1 platform (Platform Holly) and Rincon Island are in state waters (MMS 2000). The structures in federal waters were installed after the passage of NEPA and the Coastal Zone Management Act of 1972. In state waters, Platform Holly was installed in 1966. Federal OCS leases within the Study Area yield approximately 93,205 barrels (one barrel equals 42 gallons) of oil per day and 112,318 million cubic feet of gas per day (County of Santa Barbara Energy Division 2001). Annual oil production has steadily declined since 1995. Annual gas production has been declining since 1999 (MMS 2007a).

Three pre-existing federal oil and gas lease units exist within the CINMS; very small portions of the Port Hueneme Field, the Santa Clara Field, and the Cavern Point Field overlap with the CINMS boundary; however, there are no platforms within the CINMS boundary.

Table 3.5-1. Federal Offshore Oil and Gas Fields, Operators, Platforms, Installation Date, and Platform Depth

Field	Operator	Platform(s)	Installation Date	Platform Depth (feet)
Port Hueneme	DCOR	Gina	1980	95
Santa Clara	DCOR	Gilda	1981	205
	Venoco	Grace	1979	318
Dos Cuadras	DCOR	Hillhouse	1969	190
	DCOR	A	1968	188
	DCOR	B	1968	190
	DCOR	C	1977	192
Carpinteria	DCOR	Henry	1979	173
	POOLLC	Hogan	1967	154
	POOLLC	Houchin	1968	163
Sockeye	Venoco	Gail	1987	739
Pitas Point	DCOR	Habitat	1981	290
Hondo	ExxonMobil	Hondo	1976	842
	ExxonMobil	Harmony	1989	1,198
Pescado	ExxonMobil	Heritage	1989	1,075
Point Arguello	Arguello, Inc.	Hermosa	1985	603
	Arguello, Inc.	Harvest	1985	675
	Arguello, Inc.	Hidalgo	1986	430
Point Pedernales	PXP	Irene	1985	242

Source: MMS 2007b.

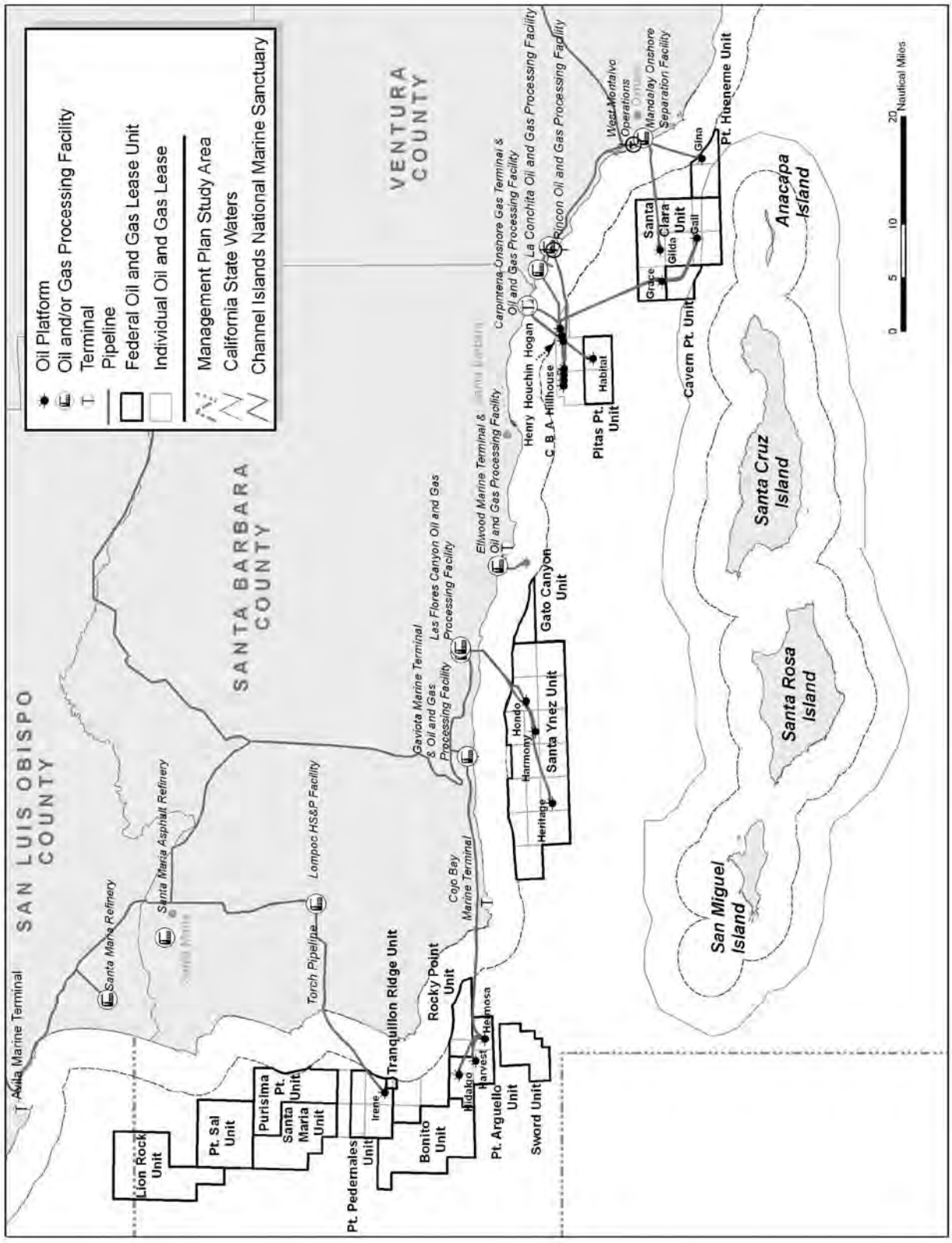

Figure 3.5-1 CINMS EIS Study Area Federal Oil and Gas Leases

A brief characterization of each developed oil and gas field in the federal OCS follows:

- The Carpinteria Offshore Field is located in the eastern Santa Barbara Basin, approximately 4 miles south of Carpinteria. The field is developed from both state and federal leases. Platforms Hope and Heidi, which were removed in early 1996, produced from the state leases. Platforms Hogan, Houchin, and Henry produce from federal leases. The operator of the platforms Hogan and Houchin is planning a major redrilling program to access additional reserves of oil in the field.

  This field is mature and in an advanced stage of depletion. Annual oil production declined by 22% and annual gas production declined by 19% between 1999 and 2003 (MMS 2007a).

- The Dos Cuadros Field is located in the eastern Santa Barbara Basin, approximately 6 miles southwest of Carpinteria. The field is produced from four platforms: Platform Hillhouse, A, B, and C. All platforms are located 6 miles from shore. Three new wells were drilled between 1999 and 2003.

  The field has reached a mature stage and production at most wells is declining. Annual oil production declined by 28% and annual gas production declined by 8% between 1999 and 2003 (MMS 2007a).

- The Hondo Field is produced from Platforms Hondo and Harmony, both of which are in federal waters, approximately 6 miles from shore. Eight new wells were drilled between 1999 and 2003.

  Annual oil production declined by 37% and annual gas production declined by 26% between 1999 and 2003 (MMS 2007a).

- The Hueneme Field is located in the eastern Santa Barbara Basin approximately 4 miles southwest of Port Hueneme. The field is produced from Platform Gina, which is located approximately 6 miles from shore. No new wells were drilled in the Hueneme Field between 1999 and 2003.

  This field is in a mature stage of development and production is declining. Annual oil production declined by 68% and annual gas production declined by 18% between 1999 and 2003 (MMS 2007a).

- The Pescado Field is produced from Platform Heritage, approximately 8 miles from Gaviota. The field was further developed with the drilling of three new wells.

  Annual oil production declined by 28% and annual gas production declined by 48% between 1999 and 2003 (MMS 2007a).

- The Pitas Point Field is the only producing gas field in the Pacific OCS and is produced from Platform Habitat, approximately 8 miles from shore. The field is in decline and has a limited future productive life. Annual gas production declined by 63% between 1999 and 2003 (MMS 2007a).

- The Point Arguello Field is located in the southern part of the Santa Maria Basin, approximately 6 miles from shore. Platforms Hermosa, Harvest, and Hidalgo are used to produce the field's oil. Annual oil production declined by 35% and annual gas production increased by 64% between 1999 and 2003 (MMS 2007a). The increase in gas production was primarily due to recycling of injected gas.

- The Point Pedernales Field is located in the southern Santa Maria Basin, approximately 6 miles west of Point Pedernales. The field is produced from Platform Irene. Annual oil production declined by 26% and annual gas production declined by 34% between 1999 and 2003 (MMS 2007a).

- The Santa Clara Field is located in the eastern Santa Barbara Basin approximately 7 miles west of Oxnard. The field is produced from Platforms Gilda and Grace. Gilda is located approximately 10 miles from shore. Grace is located in the eastern Santa Barbara Basin, and is approximately 10 miles north of Anacapa Island. As of August 1998, the MMS indicated that the operator has shut in or plugged and abandoned all the production wells at Platform Grace. The Santa Clara Field is in a mature development stage and total production is declining. Annual oil production declined by 27% and annual gas production declined by 31% between 1999 and 2003 (MMS 2007a).

- The Sockeye Field is produced from Platform Gail, approximately 11 miles west of Port Hueneme. One new well was drilled between 1999 and 2003.

  This field has reached a mature development stage. Annual oil production increased by 24% and annual gas production declined by 63% between 1999 and 2003 (MMS 2007a).

State Activities

Commencing in the 1920s, the California state legislature placed most of the California coast off limits to oil and gas leasing and development through a variety of oil and gas "sanctuary" statutes. However, large areas of the coast and submerged lands (0 to 3 miles offshore) remained unprotected. By 1989, the State Lands Commission filled in the remaining gaps in California "sanctuary statutes" and administratively foreclosed the possibility of new oil and gas leasing in state coastal waters, with few exceptions. This administrative sanctuary was later incorporated by the legislature in its comprehensive ban on new oil and gas leasing, through the California Coastal Sanctuary Act of 1994 (California Coastal Commission 1999). Pursuant to this California statute, all state coastal waters, except those under lease on January 1, 1995, are permanently protected from development.

State tide and submerged lands include the area from the mean high tide line seaward to the 3 nmi boundary with the federal OCS. State leases in the Study Area yield 1,466 barrels (one barrel equals 42 gallons) of oil per day and 1,249 million cubic feet of gas per day (County of Santa Barbara Energy Division 2001). Figure 3.5-2 depicts the state oil and gas leases in the Study Area.

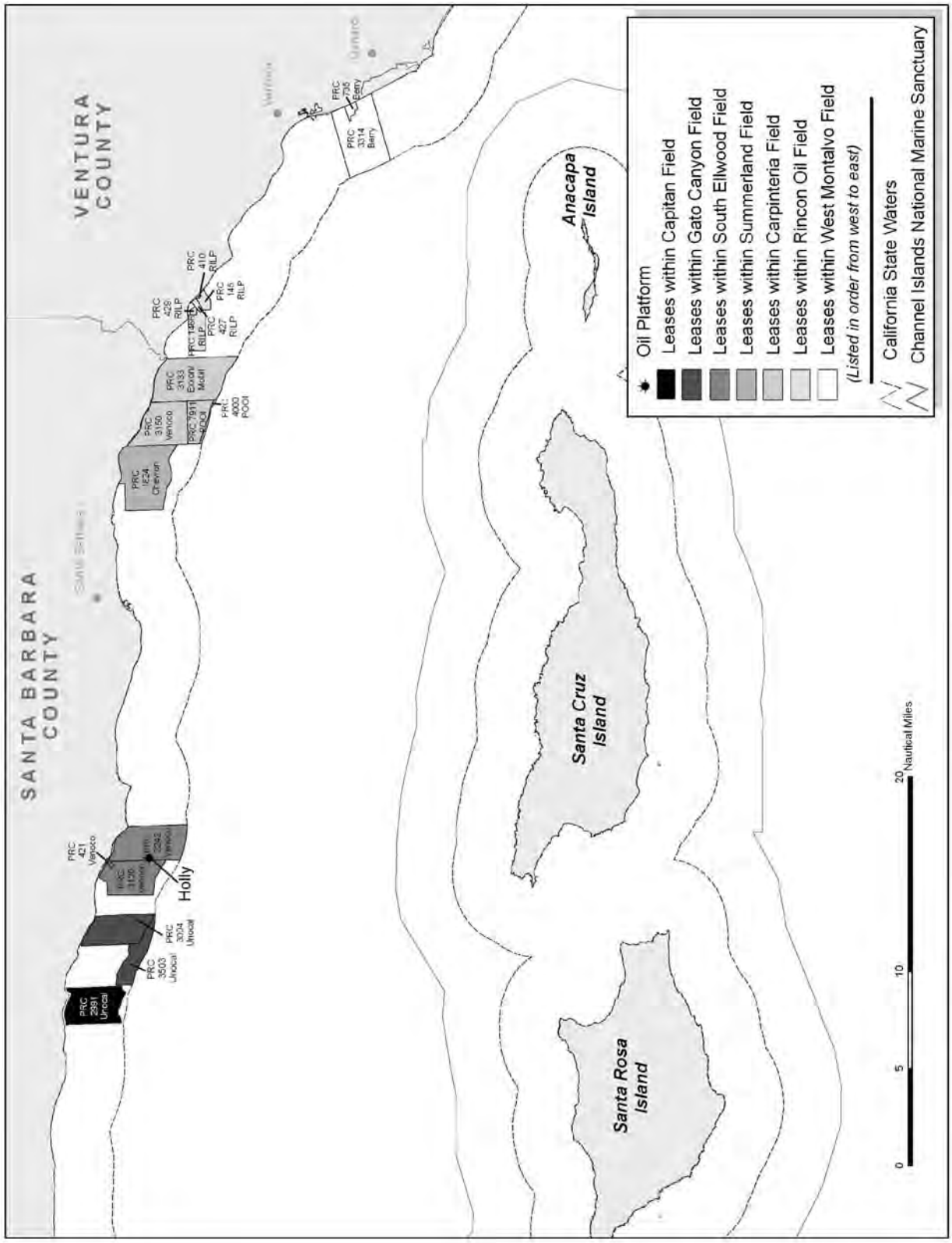

Figure 3.5-2 CINMS EIS Study Area State Oil and Gas Leases

The following describes the state oil and gas leases in the Study Area:

- The West Montalvo Field is located at the eastern end of the Study Area. The majority of the West Montalvo Field is located onshore; however, the field extends offshore into the California state tide and submerged lands. The majority of the production in the offshore portion comes from the Colonia Zone of the Sespe formation. The West Montalvo Field is produced from onshore wells, some of which are directionally drilled under the ocean ("offshore" wells). No platforms or drilling islands are used to produce offshore reserves.

  The offshore wells produce from state lease PRC-735 and the onshore wells (*i.e.*, those producing from the onshore portion of the field) produce from state lease 3314 (MMS 2000).

- The Rincon Oil Field is located in state waters and is composed of state leases PRC-145, PRC-410, PRC-427, PRC-429, and PRC-1466. Production is from the Pico formation and has essentially no sulfur or hydrogen sulfide in the crude or gas.

  As of August 1997, the field was being produced from two locations: a man-made drilling island located approximately 0.6 miles from shore in 45 feet of water on lease PRC-1466 and eight onshore wells drilled into state waters in leases PRC-145 and PRC- 410. Rincon Island is a man-made drilling island that was constructed in 1958 and began production in 1960. The island has its own oil/water/gas processing capability and is connected to the mainland by an elevated causeway. The onshore facility that processes the production from the onshore "offshore" wells is located approximately 1.2 miles south of the point where the causeway reaches shore.

  Since 1995, the site has changed ownership and the current owner is evaluating methods for increasing production from the field including reworking and redrilling existing wells (MMS 2000). The initiated, proposed, and planned improvements (as of August 1997), may result in production higher than originally projected. However, given the relatively small level of production from the facility, it is unlikely that the resulting production will have significant impacts on the operation of the facility or the subregion as a whole.

- The Carpinteria Field is located in the eastern Santa Barbara Basin about four miles south of Carpinteria and extends across the 3-mile limit separating the state and federal jurisdictions. The field covers portions of state leases PRC-3133, PRC-3150 PRC-4000, PRC-7911 and federal leases (not shown in Figure 3.5-2) OCS-P0166 and OCS-P0240. All production is from reservoirs in the Repetto Formation and is free of sulfur and hydrogen sulfide.

  The state leases were produced by the removed Platforms Hope and Heidi, which were both in lease PRC-3150. Platforms Heidi and Hope were removed in early 1996. The federal leases are being produced from Platforms Hogan and Houchin located in lease OCS-P0166 and by Platform Henry located in lease OCS-P0240. Oil and gas produced from these platforms is transported to the La Conchita Facility via pipelines from Platform Hogan with a landfall in Ventura County in the La Conchita area.

  The Carpinteria Field is a mature, fully developed oil field in an advanced stage of depletion (MMS 2000).

- The Summerland Field is located between the Carpinteria Field and South Ellwood Field. It includes state lease PRC-1824. Production ceased in 1992.

- The South Ellwood Field is located in state waters near Goleta and includes lease PRC-3120 and PRC-3242, and PRC 421. Projected production is from the Rincon and Monterey formation.

  The South Ellwood Field is produced from Platform Holly, which is located in 211 feet of water on lease PRC-3242 approximately 2 miles from shore in California state waters. Platform Holly was installed in 1965 and production began in 1966.

  In addition to the platform, a seep containment tent was installed in 1983 to collect gas from natural seeps and the gas is sent to the Ellwood Oil & Gas Processing Facility by pipeline. The South Ellwood Field is apparently in a mature level of development. The South Ellwood Field, Platform Holly and the associated infrastructure were sold to a new operator (Venoco) in August 1997 (MMS 2000).

- The Gato Canyon Field is located in state waters west of the South Ellwood Field. It includes state leases PRC-3004 and PRC-3503. Neither state lease has been developed.

- The Capitan field is located between Gato Canyon Field and Point Conception. Only one State lease, PRC-2991, exists within the Capitan Field and it has not been developed.

Future Production

The MMS projected offshore oil and gas production from 1995 to the end of 2015 is shown in Table 3.5-2. OCS oil and gas production is projected to decline in the Study Area by the year 2015 (MMS 2000).

Table 3.5-2. Oil and Gas Production and Projections on the OCS

Year	Oil (MMSTB)	Gas (BCF)
1995	73.99	57.69
2000	48.65	83.15
2015	4.38	35.00

Notes: BCF - billion cubic feet; MMSTB - million stock tank barrels; OCS – Outer Continental Shelf
Source: MMS 2000.

The MMS (2000) notes that several platforms would likely be decommissioned within the next 25 years because they are nearing the end of their economic production.

Undeveloped Leases

The Congressional moratoria and Presidential leasing deferrals do not restrict development of federally leased areas. Thirty-six of the 79 OCS leases offshore California are undeveloped. These 36 tracts were leased between 1968 and 1984 and are in the Santa Barbara Channel or the Santa Maria Basin. This means there are several undeveloped leases not producing natural gas and/or oil, although some of these leases have been explored. Currently, four of the undeveloped leases are under administrative appeal in the Interior Board of Land Appeals. Projects have also been proposed for a number of the undeveloped leases.

The MMS may grant lease suspensions or extensions upon lessees' requests or directed suspension by the MMS Regional Director. When MMS receives a request for suspension, its options are to either approve or deny the request based upon the criteria in the MMS regulations. For a comprehensive review and

summary of this issue, see California Coastal Commission (1999), California Offshore Oil and Gas Leasing and Development Status Report.

Table 3.5-3 depicts the federal leases that may be developable from existing or new platforms. If a federal lease does not have an existing platform nearby, there may be a need for a new offshore oil rig or platform to develop the lease.

Table 3.5-3. Federal Leases Developable from Existing or New Platforms

Unit Name	36 Undeveloped Federal Leases	Owner	Closest Existing Platform
Cavern Point	210, 527	Venoco	Gail and Grace
Gato Canyon	460, 464	Noble Energy, Inc.	N/A
Sword	319, 320, 322, 323A	Noble Energy, Inc.	Hermosa
Rocky Point	452, 453	PXP	Harvest, Hermosa, and Hidalgo
Bonito	443, 445, 446, 449, 499, 500	PXP	N/A
Santa Maria	425, 430, 431, 433, 434	Aera Energy, LLC	N/A
Purisma Point	426, 427, 432, 435	Aera Energy, LLC	N/A
Point Sal	415, 416, 421, 422	Aera Energy, LLC	N/A
Lion Rock	396, 397, 402, 403, 408, 414	Aera Energy, LLC	N/A
(Non-Utilized)	409	Aera Energy, LLC	N/A

Source: MMS (http://www.mms.gov/omm/pacific/lease/undevlease.htm).

3.5.1.3 Liquefied Natural Gas

There is a growing demand for natural gas in the United States, including California. The North American supply of natural gas is maturing, which means the United States will have to rely more on imported supplies. Natural gas is often imported in the form of liquefied natural gas, which is much more compact than the gaseous form, and therefore much easier to transport. In fact, one carrier load of liquefied natural gas is equal to 600 times the volume of natural gas shipped via pipeline (BHP Billiton 2003). In order to convert natural gas to its liquid form, it is cooled to minus 260 degrees Fahrenheit. During this cooling process the gas is purified, eliminating compounds like nitrogen, carbon dioxide, and hydrogen sulfides. The elimination of these compounds and other impurities enhances the clean-burning properties of the gas. Warming is required in order to convert liquefied natural gas back to its gaseous form.

Currently there are four liquefied natural gas receiving and regasification terminals in the United States, but no terminal is located on the West Coast (Marks 2003). Recently, several companies have proposed to locate liquefied natural gas import facilities in California (Marks 2003). Although there are no

liquefied natural gas facilities within the CINMS, a couple of these facilities are proposed in adjacent locations within the Study Area.

In the 1970s, California's gas utilities were planning to build a liquefied natural gas import facility. They identified the Port of Los Angeles, Oxnard, and Point Conception as possible sites, all of which were outside the CINMS (Marks 2003). However, the three agencies involved in site approval could not agree on a preferred site. To address the conflict, at least at the state level, the project proponents turned to the legislature, which enacted the Liquefied Natural Gas Terminal Siting Act of 1977. Under this act the California Public Utilities Commission, with input from the California Coastal Commission and California Energy Commission, could approve one site. The California Public Utilities Commission chose Point Conception because of its remote location, but the proponents cancelled the project when liquefied natural gas became uneconomical. In 1987, the legislature repealed the Liquefied Natural Gas Terminal Siting Act, and no company has attempted to site a liquefied natural gas import facility on the West Coast until recently. The current process for siting such facilities is unclear as a result of that repeal (Marks 2003).

BHP Billiton proposed a liquefied natural gas facility named Cabrillo Port to be located 21.5 miles offshore of the City of Oxnard (BHP Billiton 2003), outside of the CINMS. This facility, which was denied a federal Deepwater Port license in 2007 after California Governor Arnold Schwarzenegger expressed disapproval to the U.S. Maritime Administration, would have consisted of a floating storage and re-gasification unit (FSRU), which would be the receiving point for shipments of liquefied natural gas from ocean carriers. An FSRU is a floating vessel permanently moored offshore. Cabrillo Port would have received and store liquefied natural gas from ocean tankers. A process called re-gasification would then have been used to convert the liquefied natural gas into its gaseous form, which would be transferred to the mainland via new pipelines that would connect to existing pipelines of the Southern California Gas Company at the Ormond Beach facility.

Another type of liquefied natural gas facility involves the conversion of an offshore oil platform to accommodate liquefied natural gas storage and re-gasification. In March 2003, Crystal Energy signed a long-term lease agreement to use Platform Grace, located 11 miles offshore of Ventura County, as a liquefied natural gas facility (Crystal Energy 2003). This facility would receive liquefied natural gas from ocean carriers, store it, and convert it to a gaseous form before shipping it to land via existing pipeline corridors.

Potential impacts generated by a liquefied natural gas facility include impacts to air quality, the marine environment, visual resources, and traffic. Diesel-fired generators are the primary source of air emissions associated with liquefied natural gas facilities (Marks 2003). Diesel-fired generators are typically operated only during an emergency, therefore, under normal operating conditions, air emissions from the facility would be minimal. However, the U.S. Coast Guard (USCG) requires that vessels transporting liquefied natural gas generate their own electricity while they are in port. As a result, docked vessels transporting liquefied natural gas would generate air emissions from their diesel generators. Tugboats required to bring the vessels into port would also generate air emissions. However, in the case of an offshore liquefied natural gas facility, these impacts may not be generated, since vessels carrying liquefied natural gas would not be required to enter a port.

Liquefied natural gas facilities do not consume significant amounts of water or produce significant amounts of waste (Marks 2003). However, cold-water discharges are required in order to operate the heat-exchanger regasification systems. These cold-water discharges could generate significant impacts to marine life. If dredging and filling activities were required to accommodate large tankers carrying

liquefied natural gas, impacts to the marine environment could also be significant. Visual impacts and traffic impacts may also be generated by a liquefied natural gas facility.

Liquefied natural gas is a hazardous material; the primary safety concerns are the potential consequences of a liquefied natural gas spill (Marks 2003). Liquefied natural gas hazards result from three of its properties:

- Cryogenic temperatures;
- Flammability characteristics; and
- Dispersion characteristics.

The extreme cold of liquefied natural gas can directly cause injury to humans and, on contact with metals, such as ship decks, can cause immediate cracking. Exposure to the vapor cloud can cause asphyxiation due to the absence of oxygen. An ignited liquefied natural gas vapor cloud can cause extensive damage to life and property as well (Marks 2003). Spilled liquefied natural gas would disperse faster on the ocean than on land and vaporizes more quickly on water (Marks 2003).

3.5.1.4 Transfer of Oil and/or Gas to Shore

Pipelines

Although oil and locally produced gas may be processed on a platform, in most cases they are processed at an onshore facility. In the Study Area, most offshore oil and locally produced gas are transferred to either the Unocal Santa Maria Refinery in San Luis Obispo County or to the Chevron oil and gas plant at Gaviota in Santa Barbara County. Transfer takes place through either the 180 miles of pipeline or by vessel. New liquefied natural gas storage and re-gasification units would require new pipelines to the mainland.

Lightering

Lightering is a method of delivering foreign crude oil to United States refineries and importing petroleum products (NRC 1998). Lightering, per the NMSP program-wide regulations at 15 CFR 922.3, means "at-sea transfer of petroleum-based products, materials, or other matter from vessel to vessel." Although no lightering currently occurs in or near the CINMS, the regulatory change under Alternative 1 (described in section 2.0) would preclude this permanently; therefore, a discussion of this process is included in the following text.

Lightering becomes necessary when very large tankers, which are often used to move cargo from the Arabian Gulf and other distant sources of oil, are too wide and too deep to enter most United States ports. Transferring part or all of the cargo to smaller vessels for delivery to terminals is less expensive than moving all of the cargo the entire distance in a larger number of smaller vessels.

Lightering safety became a topic of national interest several years ago because of public concerns about oil spills in general (NRC 1998). The Coast Guard Authorization Act of 1996 requires that the USCG coordinate with the Marine Board of the NRC to conduct studies on the risks of oil spills from lightering off the United States coasts. Accordingly, an 11-member committee was assembled by the NRC, under the auspices of the Marine Board, to evaluate current lightering practices and trends, analyze the safety record, assess the regulatory and standards-setting framework, analyze accident prevention and risk

reduction measures, and recommend technical and institutional improvements. The highlights of the one-year study and the committee's 16 recommendations are summarized below.

More than 25 percent of the 7.5 million barrels of crude oil imported into the United States each day is lightered (NRC 1998). Small amounts of refined products are also lightered. Approximately 95 percent of offshore lightering (*i.e.*, between 12 and 200 nmi off the United States coast), by volume, takes place in the Gulf of Mexico, according to government data. Additional offshore lightering takes place off Long Island, near the New Jersey and Virginia capes, off San Diego in California, and near the Bahamas. More than two-thirds of inshore lightering (*i.e.*, within 12 nmi of the coast), by volume, takes place on the East Coast, primarily in the Delaware Bay and River and Long Island Sound. The rest of the inshore lightering takes place on the West Coast, in San Francisco Bay. No known lightering takes place in the Santa Barbara Channel. The committee's estimates of the volume of oil involved in inshore lightering, combined with government data on offshore lightering, provide the most complete picture of United States lightering activity available to date. Although the projected increase of United States oil imports may lead to an increase in lightering, the committee expects that increases in the near term will be small and that current lightering patterns and volumes will remain fairly steady.

The vessel from which the cargo is removed is referred to as the ship to be lightered (STBL), and the receiving vessel is referred to as the service vessel. The STBLs and service vessels may either be owned by an oil company or chartered on a long-term basis or for a specific voyage. The STBLs are typically large tankers. A number of United States companies are engaged solely in the lightering business and operate service vessels. Service vessels may be all-purpose tankers, tankers equipped specifically for lightering, integrated tug-barge units equipped specifically for lightering, or standard all-purpose tug-barge units.

The USCG data on lightering safety for 1984 to 1996 indicate that few spills occurred during lightering on United States coasts and, when a spill did occur, the average volume was only 26 barrels (1,095 gallons) (NRC 1998). Recurring causes of spills that appear to be directly related to lightering include valve failures, tank overflows, and hose ruptures. From 1993 to 1997, no spills were reported on the East or West coasts of the United States, and only seven spills (accounting for less than 0.003 percent of the total volume lightered) were reported in the Gulf of Mexico.

In an emergency, lightering may be needed within or adjacent to the CINMS. In accordance with the Oil Pollution Act of 1990 and 33 CFR part 155, owners and operators of tank vessels are required to submit vessel response plans to the USCG for review and approval (U.S. Coast Guard 2003). These plans describe the preparedness arrangements made by the owners and operators for each Captain of the Port zone in which their tank vessel operates. These plans must include arrangements for a “qualified individual,” a spill management team, and contracted response resources. Contracted response resources include designations of emergency lightering companies, oil spill removal organizations, and salvage and firefighting companies (U.S. Coast Guard 2003).

3.5.1.5 Decommissioning of Offshore Oil and Gas Platforms

To date, seven relatively small offshore oil structures have been removed from state waters of the Santa Barbara Channel. The most recent project occurred in 1996 when Chevron removed Platforms Hope, Heidi, Hilda, and Hazel. These platforms were in water depths ranging from 100 to 140 feet. One hundred and thirty-four wells were plugged and abandoned on these platforms. In order to remove the rigs and bring them ashore for recycling and disposal, explosives and heavy machinery were used to tear the rigs from their foundations. The biomass that accumulated around these OCS oil and gas structures was destroyed during the platform removal (MMS 1997). Shell mounds remain on the bottom of the sea floor from these structures.

Comprehensive reviews of the ecological, economic, and regulatory requirements associated with decommissioning are found in McGinnis *et al*. (2001) and Carr *et al*. (2003). Impacts from the removal of oil and gas platforms depend primarily on the methods and extent to which the structure is removed. Removal may lead to issues such as:

- Destruction of the biomass that has accumulated on and around a structure;
- Destruction of benthic habitat and re-suspension of sediments;
- Noise impacts on living resources from explosives;
- Interference with filter feeding functions of marine organisms;
- Loss of food sources;
- Disruptions in populations and migratory patterns of fish, invertebrates and marine mammals; and
- Lowered photosynthesis and oxygen levels.

3.5.1.6 Regulatory Setting

A complete characterization of the regulatory setting for OCS oil and gas activities is found in California Resources Agency (1997), *California's Ocean Resources: An Agenda for the Future*.

Federal OCS Oil and Gas Exploration, Development, and Production

The MMS leases the federal OCS as well as conducts environmental review, permit processes, and ongoing monitoring for specific proposals to explore for, or produce oil and gas resources.

The NMFS protects marine species that could be affected by oil and gas development, including most marine mammals and anadromous fishes, and conducts a consultation with the applicant to determine if the development would threaten the continued existence of any protected species pursuant to the federal ESA.

The U.S. Army Corps of Engineers (USACE) requires permits to locate any surface structures in navigable waters.

The USCG implements provisions of the Oil Pollution Act of 1990 and requires adequate provisions to prevent and respond to oil spills that could occur from these facilities.

The U.S. Environmental Protection Agency (U.S. EPA) regulates operational discharge requirements under the Federal Water Pollution Control Act (usually concerning the discharge of drill muds and cuttings) and air quality impacts under the Clean Air Act.

The USFWS protects certain species that could be affected by offshore oil and gas operations, such as southern sea otters, and conducts consultation with applicants to determine if the development would threaten the continued existence of protected species pursuant to the federal ESA.

State OCS Oil and Gas Exploration, Development, and Production

The California Coastal Commission conducts federal consistency review of federal permits or any federal activity that "affects" a land or water use or natural resource of the coastal zone, and issues coastal development permits for activities in state tidelands and within land portions of the coastal zone, if local governments have not assumed the land permitting role under the California Coastal Act.

The Division of Oil and Gas (Department of Conservation) provides technical assistance to the California Coastal Commission for federal consistency review of projects on the OCS and has direct regulatory authority over specified oil and gas operations in state tidelands or onshore.

The CDFG provides technical assistance to the California Coastal Commission for federal consistency review of projects on the OCS and has direct jurisdiction for protecting and managing the state's wildlife resources that could be affected by proposed projects.

The CDFG's Oil Spill Prevention and Response (OSPR) provides technical assistance to the California Coastal Commission for federal consistency review of projects on the OCS, works with the USCG and other federal agencies to improve oil spill prevention and response in federal waters, and is responsible for the review and approval of oil spill prevention and contingency plans for marine facilities in California.

The State Lands Commission provides technical assistance to the California Coastal Commission on federal consistency reviews for projects on the OCS, leases state tidelands, administers lease agreements for oil and gas production activities on land, and, in the case of a production facility located in federal waters, would issue a right-of-way lease for any portion of the pipeline which crosses state tidelands.

The State Water Resources Control Board and Regional Water Quality Control Boards provide technical assistance to the California Coastal Commission on federal consistency reviews for projects on the OCS that include discharges into the water column, and administer the NPDES and Waste Discharge Requirements for discharges from facilities in state tidelands.

The Air Pollution Control District and local Air Quality Management Districts administer approved state implementation plans for air emission discharges from onshore oil and gas facilities within their jurisdiction and from facilities on the OCS if delegated such authority by the U.S. EPA.

Local Agency OCS Oil and Gas Exploration, Development, and Production

County Land Use and Environmental Quality Reviews maintain regulatory authority over all onshore facilities used to support offshore oil and gas developments, including zoning, building permits, coastal development permits in areas with approved local coastal plans and all other applicable permits.

While state and federal governments have direct management jurisdiction over their respective offshore jurisdictions, local governments have jurisdiction over the permitting of onshore production facilities associated with OCS oil and gas activities (*e.g.*, processing plants, pipelines, supply bases, and marine terminals). Development in unincorporated county areas is regulated by a county's comprehensive general plan, local coastal program, and zoning ordinances. Although all the elements of the general plan apply to development within the coastal zone, the Local Coastal Program (LCP) (which includes the coastal plan, coastal zoning ordinance, coastal zoning district maps, and other implementing actions) addresses specific policies that supersede other general plan policies. The LCP identifies acceptable development in the coastal zone and clarifies local policies and requirements that implement the requirements of the California Coastal Act. Local governments with a certified LCP have coastal

development permit authority in the onshore coastal zone area. Locally issued coastal development permits for major energy facilities can be appealed to the California Coastal Commission. Local resource management or planning agencies typically act as the lead agency for projects involving offshore facilities, even when these projects also involve components on state tide and submerged lands (MMS 2000).

Because offshore oil production is often dependent on onshore support facilities, county governments are active participants in the planning and permitting process. Although most county agencies only have jurisdiction for the onshore components of the project, revisions to the OCS Lands Act and the Clean Air Act delegate regulatory review responsibilities to Air Pollution Control Districts. Under some circumstances, local residents are also formal participants in the planning process because county-wide initiatives have been passed that require the vote of citizens to approve onshore support facilities (MMS 2000).

Liquefied Natural Gas

Federal, state, and local government permits would be required in order to build a liquefied natural gas receiving and regasification terminal in California. Based on recent power plant licensing experience, the California Energy Commission staff believe approximately 100 permits could be required for a liquefied natural gas facility in California (Marks 2003).

Federal Undeveloped Leases

In 2003, the U.S. Department of the Interior decided not to appeal a court decision that supported the state's earlier lawsuit against the federal government, in the dispute over whether the California Coastal Commission has jurisdiction to review consistency certifications for requests for suspensions of exploration, development, and production or operation of 36 undeveloped offshore oil and gas leases within the Study Area (California Coastal Commission 2003a). The Ninth Circuit Court of Appeals upheld the authority of the state of California to review the re-issuance of federal offshore oil and gas leases for consistency with the state's coastal management plan (California Coastal Commission 2003b). The future of the federal undeveloped leases remains unknown.

State Undeveloped Leases

Development of oil and gas resources on existing state leases in the Study Area is subject to the regulatory authority of the State Lands Commission. Development of resources on state tide and submerged lands involving facilities at onshore locations is subject to local agency authority, including local agency administration of the California Environmental Quality Act (CEQA) requirements and other land use controls. As the California lead agency for administration of the CEQA process, the State Lands Commission is responsible for coordinating with other regulatory agencies and the public through the CEQA environmental review process. The California Coastal Commission is another key commission involved in the review of development on state tide and submerged lands (MMS 2000).

Transfer of Oil and/or Gas to Shore (Lightering)

Various controls have been imposed on lightering (and tanker operators in general) by international agreements and U.S. laws and regulations (NRC 1998). The USCG oversees lightering operations outside port areas through six general mechanisms: vessel design requirements, operational procedures, personnel qualifications, oil spill contingency planning and equipment requirements, vessel inspection, and monitoring. Three separate sets of regulations have been promulgated by the USCG regarding

lightering activities. One set applies to lightering in inshore waters. For this purpose, inshore waters means all waters inside of 12 nmi from the coast, including all internal waters (*i.e.*, lakes, bays, sounds, and rivers). The second set of regulations applies to lightering in all offshore waters, except for designated lightering zones. Offshore, for this purpose, means between 12 and 200 nmi off the coast. The third, and most comprehensive, set of regulations applies in designated lightering zones more than 60 nmi off the coast. The USCG does not regulate lightering in foreign waters or outside the U.S. EEZ. Technically, lightering in offshore waters is subject to regulation by the USCG only when the cargo is bound for a United States port. As a practical matter, though, all oil lightered in United States waters is bound for the United States. Under the comprehensive national lightering regulations, four areas are designated lightering zones (offshore) in the Gulf of Mexico.

In general, lightering is performed with the local USCG captain of the port exercising regulatory authority (NRC 1998). The regulatory regime for lightering is widely regarded as adequate, with one notable exception. Vessels sometimes have to maneuver excessively or separate prematurely to comply with a legal provision that requires certain vessels to remain within designated lightering zones in the Gulf of Mexico except in emergencies.

Industry guidelines for lightering have been established by at least two industry groups, and most individual companies have developed their own internal guidelines (NRC 1998). A set of comprehensive minimum standards for offshore lightering, now in its third edition, has been developed by the Oil Companies International Marine Forum (OCIMF), an international group of vessel owners and charters. The guidelines contain advice on lightering procedures and arrangements, as well as specifications for mooring, fenders, and cargo transfer hoses. In the United States, a supplement to the OCIMF guidelines was developed by the Industry Taskforce on Offshore Lightering, a cooperative organization that promotes industry self-policing and, in partnership with the USCG, continuous improvement in lightering in the Gulf of Mexico. The OCIMF guidelines are also widely used for U.S. inshore lightering (NRC 1998). General standards for inland shipping have been established by the American Waterways Operators, but no separate lightering standards have been established for inland trade despite its unique characteristics, such as the extensive use of barges and the frequent transport of specialized refined products.

Decommissioning of Offshore Oil and Gas Platforms

As of 2003, international, federal, and state law requires the complete removal of California OCS oil and gas structures (McGinnis 1998, 2003; McGinnis *et al.* 2001). A brief overview of the regulatory compliance requirements follows:

- The MMS is responsible for implementing Federal law (30 CFR part 250) which requires the plugging and abandonment of wells; full removal of well conductors and platform jackets to 15 feet below the mud line; decommissioning and full removal of platform decks; decommissioning and removal of pipelines and power cables as appropriate; and site clearance.

- The California Department of Conservation, Division of Oil, Gas and Geothermal Resources is responsible for establishing the basic plugging requirements found in the California Code of Regulations Title 14 Division 2, Chapter 4, section 1745.

- The California State Lands Commission is also responsible for establishing the basic plugging requirements found in the California Code of Regulations Title 2 section 2128(q).

There are also lease and permit requirements that must be met during decommissioning of offshore oil and gas structures. The CDFG, the agency with oversight over the state's artificial reef program, has

policy guidelines in place for artificial reefs with a preference for those structures that provide "good" habitat.

The framework of the National Fishing Enhancement Act of 1984 (33 U.S.C. 2101 *et seq*.), as amended, provided broad discretionary authority to states to develop rigs-to-reefs programs. This act created the National Artificial Reef Plan, which identifies OCS oil and gas structures as potential materials for development of offshore artificial reefs. Gulf of Mexico states have developed rigs-to-reefs programs in accordance with the act (Carr and McGinnis 2003; McGinnis *et al*. 2001; McGinnis 2003). However, it is important to note that the ecology and socioeconomic characteristics of Gulf states are very different from those off southern California (McGinnis 2003). Since the late 1990s, several California Senate bills have proposed the use of a rigs-to-reefs option for offshore oil rigs (McGinnis *et al*. 2001).

Provisions of MMS regulations provide the flexibility to allow MMS to consider and approve methods of rig decommissioning other than complete removal, as evidenced in the Gulf of Mexico. MMS may waive the removal requirement under special circumstances, including the following: (1) proper permits from the U.S. Army Corps of Engineers, (2) siting meets USCG requirements, and (3) the state accepts liability and holds the permit for the structure under its artificial reef program. MMS's stated policy towards the rigs-to-reefs alternative is as follows, "The MMS supports and encourages the reuse of obsolete offshore petroleum structures as artificial reefs in United States waters" (McGinnis *et al.* 2001).

3.5.2 Fiber Optic Telecommunication Cables

Fiber optic telecommunications cables are increasingly used to meet the growing demand for better productivity and quality in telephone, internet, and data transmissions. As a result, the number of project proposals and specific permit requests for laying cables in marine and coastal environments has been increasing at a tremendous rate (U.S. EPA 2003). Currently, no fiber optic telecommunication cables occur or have been proposed in the CINMS.

The NMSP has issued two special use permits to allow telecommunications companies to maintain fiber optic cables beneath the seafloor within the Olympic Coast National Marine Sanctuary (two cables permitted in November of 1999) and Stellwagen Bank National Marine Sanctuary (one cable permitted in June of 2000) (Department of Commerce 2003). An additional fiber optic cable is present within the Olympic Coast Sanctuary; however, this project was completed before the NMSP had examined the issue of fiber optic cable placement within sanctuaries (NOAA 2003d).

There is evidence that the seafloor topography and rocky substrates offshore of California can preclude complete burial of fiber optic cables. No fiber optic cable projects that the California Coastal Commission has reviewed and approved have been 100 percent buriable (California Coastal Commission 2003c). Cable burial is important because it prevents potential entanglement of bottom-feeding whales, and prevents loss or damage to fishing gear.

3.5.2.1 Regulatory Setting

There currently are no specific regulations on installation of fiber optic cables in marine and coastal environments; however, each proposed project for installation of a fiber optic cable must undergo NEPA and/or CEQA review. In addition, each project must be approved by the various trust agencies of the land which the cable must pass. Finally, a Coastal Consistency Certification must be prepared and approved by the California Coastal Commission to ensure the project's consistency with an area's coastal plans and policies.

3.5.3 Vessel Traffic and Harbors

3.5.3.1 Vessel Traffic

The northeast portion of CINMS contains two shipping lanes that serve an increasing amount of domestic and international large vessel traffic for which the Santa Barbara Channel is a major thoroughfare. This section explains the large vessel traffic patterns and trends in the Santa Barbara Channel, including information about cruise ships.

Large Vessel Traffic Patterns and Trends

Large vessel traffic patterns in the Santa Barbara Channel are primarily determined by national and international guidelines and regulations. These guidelines and regulations include an International Maritime Organization (IMO) approved Vessel Traffic Separation Scheme (TSS), and IMO approved Areas to Be Avoided (ATBA). According to the U.S. Coast Guard (2004), "The objective of a TSS is to improve the safety of navigation in converging areas, dense traffic areas, or where restricted sea room limits freedom of vessel movement." Rule 10 of the 1972 Convention on the International Regulations for Prevention of Collisions at Sea (COLRegs) makes the procedures respecting TSSs compulsory (USCG 2004). While vessels must adhere to the procedures regarding TSSs, such as crossing them at right angles, vessels are not required to use any designated TSS, though failure to use one would be a major factor for determining liability in the event of a collision. Similarly, vessels are not prohibited from entering an ATBA, but as in the TSS designation, failure to comply with an ATBA would be a major factor for determining liability in the event of a vessel accident.

While transiting the Santa Barbara Channel large vessel traffic is encouraged to use the Santa Barbara Channel TSS (Figure 3.5-3), both lanes of which traverse a small portion (approximately 4%) of the Sanctuary. The Santa Barbara Channel TSS is described at 33 CFR 167.450-167.452, and includes northwest and southeast-bound lanes, with a separation zone between the lanes. The distance through Sanctuary waters that vessels transit when in the northwest-bound lane is approximately 18 nmi, while in the southeast-bound lane it is approximately 37 nmi. The average container ship that travels at 25 knots would spend less than one hour in Sanctuary waters when using the northwest-bound lane, and approximately one-and-a-half hours when using the southeast-bound lane.

Oceangoing ships in the Santa Barbara Channel are also encouraged to follow guidance for the ATBA around the CINMS (see Figure 3.5-3). CINMS is one of only two internationally accepted ATBAs on the Eastern Pacific; the other is within and adjacent to the Olympic Coast National Marine Sanctuary of Washington State. The IMO's description of the CINMS ATBA is as follows:

> In order to avoid risk of pollution in the area designated as the Channel Islands National Marine Sanctuary, all ships, except those bound to and from ports on one of the islands within the area, engaged in the trade of carrying cargo, including but not limited to tankers and other bulk carriers and barges, should avoid the following areas…. [see Figure3.5-3] (IMO 1991)

The Santa Barbara Channel, which cuts through the Sanctuary, is a major thoroughfare for oceangoing ships traveling between domestic and international ports along the Pacific coast of North America, and for large vessels traveling between ports in North America and Asia. Vessels calling at California ports identify the following last ports of call prior to arriving in California: nearly 40 percent identify a Far Eastern port such as Japan, China, or Korea; 20 percent identify a North American port such as Canada or Mexico; and 13 percent identify a South American port (California State Lands Commission 2001).

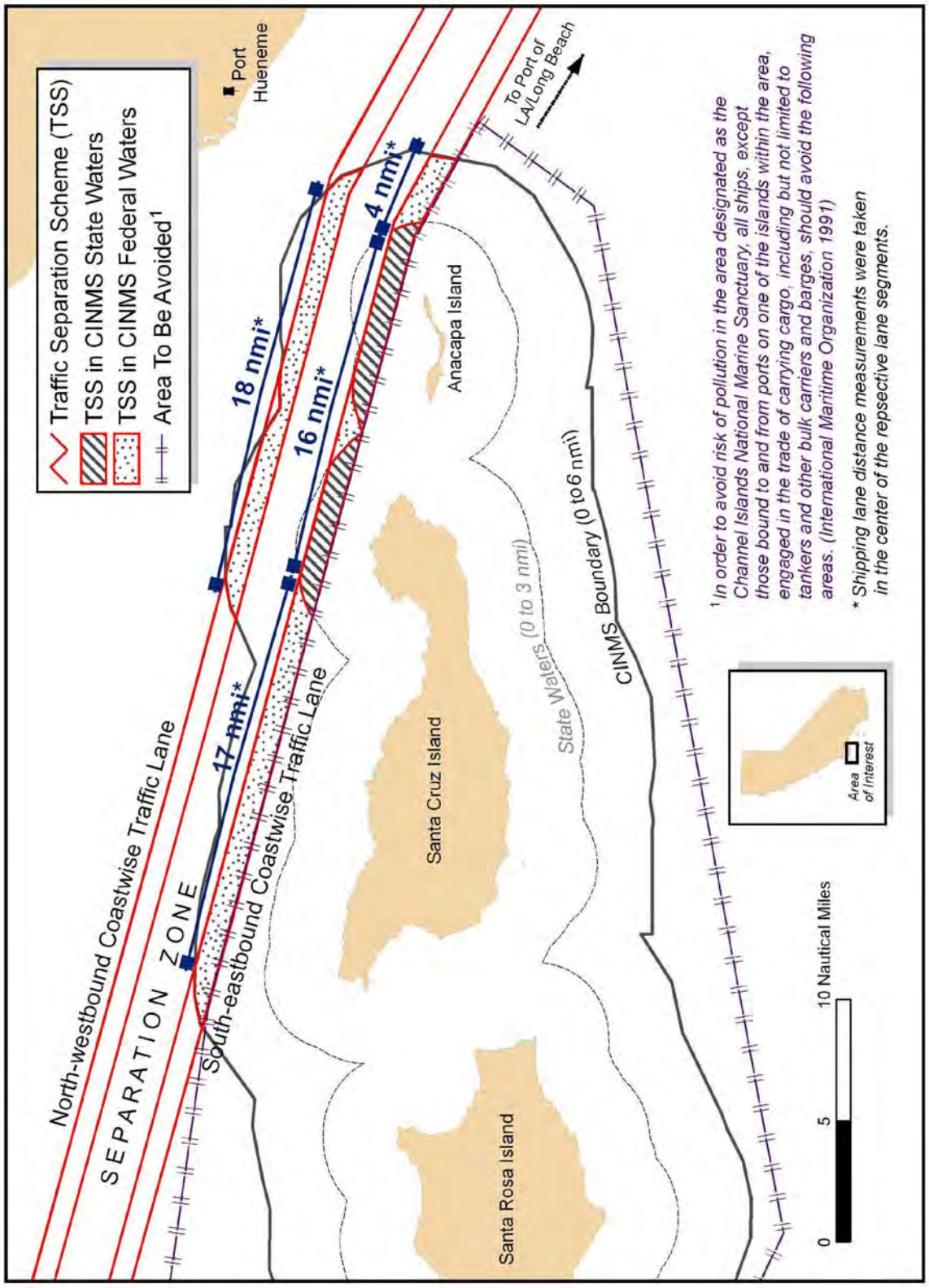

Figure 3.5-3 CINMS EIS Study Area Vessel Traffic Separation Scheme

The Sanctuary is located about 70 miles northwest of the Port of Los Angeles/Long Beach (LA/Long Beach, which is the busiest container port in North America. The containerized trade at LA/Long Beach grew 150 percent from 1995 to 2006 (Port of Long Beach 2007), and the Santa Barbara Channel is a main thoroughfare for this trade. Any forecasted increases in activity at the Port of LA/Long Beach are significant for CINMS because approximately 75 percent of the departing vessel traffic from LA/Long Beach leaves northbound and 65 percent of arriving vessel traffic comes southbound, passing through the Santa Barbara Channel.

For the year 2006, an estimated 6,980 vessels (including container ships and other large vessels) going to or coming from the ports of LA/Long Beach transited the Santa Barbara Channel and CINMS, with approximately 3,500 inbound to LA/Long Beach and 3,480 outbound (McKenna 2007). These "transit" numbers include multiple trips by the same vessel.

The expansion of the global economy has resulted in a substantial increase in oceangoing ship traffic in the Santa Barbara Channel, and consequently in the Sanctuary. The average growth rate in container traffic at the Port of LA/Long Beach was 9.9% per year over the years 1990-2003. According to the *Port of Long Beach Master Plan*, the Los Angeles Port Authority plans to expand capacity of the harbor, which will increase both the number and size of the vessels that use the Santa Barbara Channel (Port of Long Beach 2003). The Los Angeles Port Authority plans to increase capacity by 100 percent by the year 2020. During the same time frame the size of the commercial vessels that use the Santa Barbara Channel is expected to increase with the 4,000 to 4,999 twenty-foot equivalent units (TEU)[7] class, currently the most common size class, being supplemented by vessels as large as 10,000 to 12,000 TEU that are currently under construction (Mercator Transport Group 2005). The bulk of these larger vessels are expected to make their first port call at the Port of LA/Long Beach. This is because the Port of Oakland, the other large vessel port in California, will not be able to accommodate them due to the shallowness of San Francisco Bay. The expected tonnage carried by commercial vessels is also expected to increase from 75 million tons in 1980 to 202 million tons by the year 2020 (Temple *et al.* 1988; USACE 1984). With anticipated high import growth and expansion of the Panama Canal, the Port of LA/Long Beach forecasts that port calls by container vessels in 2020 could be nearly double that experienced in 2004, going from 3,224 to 6,292 (Mercator Transport Group 2005).

Port Hueneme, the deep-water international port closest to the Sanctuary region, also generates vessel traffic. In 2006, 410 cargo vessels, typically carrying automobiles or bananas, docked at Port Hueneme (Oxnard Harbor District 2007). Approximately 158 supply vessel trips are made each year to regional oil and gas facilities (Oxnard Harbor District 2002).

Because of the CINMS ATBA, oil tankers voluntarily reroute to the outer Santa Barbara Channel. This reduces the number of oil tankers in the Santa Barbara Channel to insignificant levels. Data from the California Department of Fish and Game's Office of Spill Prevention and Response (OSPR) suggest that routing this vessel traffic 50 miles offshore significantly reduces the chance of oil impacting the coast. Since 1992, oil company members of the Western States Petroleum Association (WSPA) have operated under the terms of a voluntary non-binding agreement to route all tankers carrying crude oil from Alaska to California ports at least 50 miles offshore. Subsequent to this agreement, WSPA interviewed members for a tanker movement study and found that almost 90 percent of tankers were at least 25 miles off the coast and nearly 50 percent were at least 50 miles offshore. This voluntary agreement does not apply to other carriers of hazardous materials. (California Resources Agency 1997.)

[7] A TEU is a measure of containerized cargo capacity equal to one standard 20 ft (length) × 8 ft (width) × 8 ft 6 in (height) container.

NOAA's assessment of data collected by California pursuant to California Senate Bill 771[8] indicates that ships calling on California ports in 2006 (excluding cruise ships) had crew sizes averaging approximately 20 people, and ranging from five to fifty people. The number of people on board a vessel is directly related to the amount of sewage and graywater generated.

Cruise Ships

At this time, cruise ships occasionally transit through the waters of the Sanctuary using the TSS, but are not known to stop in the Sanctuary. The Sanctuary Aerial Monitoring and Spatial Analysis Program (SAMSAP) surveys (which are not conducted at night, in foul weather, or when a pilot or aircraft is not available), have observed only two cruise ships since such flights began in 1997, and those two vessels were traveling within the TSS. These observations demonstrate that cruise ships do use the TSS, but may not be representative of the total number of cruise ships using the TSS because of the limitations on flight time. Direct observation by staff with the Channel Islands National Park indicates that more than 12 years ago cruise ship operation within the Sanctuary (and outside the TSS) did occasionally take place (Channel Islands National Park 2006, personal communication with J. Fitzgerald), but such operation has not been noted since. Thus, while cruise ships have stopped in the Sanctuary in the past (and the cruise line industry could do so again in the future), they are not presently known to stop in the Sanctuary.

Cruise ships occasionally visit the City of Santa Barbara while transiting between destinations to the north and south of the city and in doing so are likely to spend time in the Santa Barbara Channel TSS. Between 2002 and May 7, 2007 Santa Barbara received eight cruise ships visits from six different cruise ships (Santa Barbara Waterfront Department 2007, personal communication with B. Slagle). According to data that these ships provided to the City's Waterfront Department, they ranged in size from 16,927 to 116,000 GRT, and carried between 296 and 3,700 people ("total passenger/crew") on board. A summary of the itineraries for each of the eight cruise ship visits from 2002 to May 7, 2007 is provided below in Table 3.5-4.

According to the Cruise Line Industry Association, Inc. (CLIA), the cruise industry is the fastest growing segment of the travel industry, with 2,100% growth since 1970 (CLIA 2007), and an average annual passenger growth rate of 8.2% per year since 1980 (CLIA 2006b). By the end of 2007 about 100 new cruise ships will have been introduced since 2000 (CLIA 2007). The worldwide cruise ship fleet includes more than 230 ships, with vessel capacities of 3,000 passengers and crew not uncommon (U.S. EPA 2006a). A consistent increase in the size of cruise ships has occurred over the past three decades. The largest vessel currently in service is Royal Caribbean's *Freedom of the Seas* (3,634 passengers). However, the same cruise line has ordered two 5,400 passenger-capacity cruise ships as part of its "Genesis Project," with vessel deliveries expected in 2009 and 2010 (Royal Caribbean Cruises 2007). Although most of the largest vessels are destined for operation in the Caribbean, the general trend in the

[8] For California, pursuant to the Public Resources Code Section 72425(c) as amended by Senate Bill 771 (Clean Coast Act of 2005), the California State Lands Commission (SLC), in consultation with the maritime industry, prepared a survey on large oceangoing ships (300 gross tons or more) operating in California marine waters during 2006, herein referred to as the "2006 SB 771 survey." SLC provided the 2006 SB 771 survey data to the State Water Resources Control Board (State Water Board) on January 31, 2007. Based on this survey, the State Water Board must submit a report to the Legislature by October 2007. This survey targeted all large vessels calling on ports across California. However, in the absence of similar data specific to large vessels in the Santa Barbara Channel TSS, and because vessels in this TSS are likely either en route to or coming from California ports, the NMSP has treated this survey data as representative of large vessels transiting the Sanctuary. This data set relies on submission of accurate data from ship owners and captains. The Clean Coast Act is explained further in sections 3.5.3.4 of this document.

industry is toward increased vessel size. The cruise industry is building its capacity based on its growth potential and untapped markets (CLIA 2007). This overall growth trend in the industry could yield increased cruise ship traffic through the Santa Barbara Channel, and consequently the Sanctuary.

Table 3.5-4. Summary of itineraries for cruise ships visiting Santa Barbara between 2002 and May 7, 2007.

Trip	Date (mm/dd/yy)	Port Coming From	Port Going To
Reposition to Vancouver	05/06/02	San Diego	Monterey
Round trip	03/07/04	Monterey	Los Angeles
Initial US Trip to SF	06/09/04	Los Angeles	Monterey
Reposition to Hawaii	06/16/04	Monterey	Catalina
Seattle to San Diego	09/24/04	San Francisco	Los Angeles
Seattle to San Diego	09/30/05	San Francisco	Los Angeles
Vancouver to Los Angeles	05/07/06	San Francisco	Los Angeles
Los Angeles to Vancouver	05/07/07	Los Angeles	San Francisco

Source: Santa Barbara Waterfront Department 2007 (personal communication with B. Slagle.)

Vessel Accidents

Potential accidents involving commercial vessels passing through the Study Area include collisions between vessels or between a vessel and an offshore oil/gas facility, groundings, and structural or operational difficulties taking place on a vessel with hazardous cargo (County of Santa Barbara Energy Division 1989). The northern extent of the Santa Barbara Channel VTSS ends at Point Conception, where vessels must depart from or merge into the VTSS as they change course with limited visibility around the point (County of Santa Barbara Energy Division 1989). The VTSS continues to the south, but it turns at the eastern end of the channel where visibility is again limited by offshore facilities and the Channel Islands (County of Santa Barbara Energy Division 1989). Three areas within the Santa Barbara Channel present the greatest risk of collisions between ships: the western end of the VTSS, the eastern turn of the VTSS, and the intersection of the VTSS and the access lane to the Exxon Terminal (County of Santa Barbara Energy Division 1989). There are also three areas within the channel where groundings are considered most likely to occur: at Point Conception, landward of the Exxon Consolidated Marine Terminal, and eastern Anacapa Island (County of Santa Barbara Energy Division 1989). The coastline north of Point Conception has caused many groundings as well. According to the County of Santa Barbara Energy Division (1989), the risk of collisions is greater than the risk of groundings, which is considered quite low. The potential for collisions with oil facilities is greatest near Anacapa Island, where there is one platform within one mile and several platforms within 4 miles of the north lane of the VTSS. Statistically, smaller vessels have higher accident rates than the large supertankers.

The primary mechanism for damage to marine ecosystems with vessel accidents is spilled oil, which is carried on all vessels in varying amounts as fuel, cargo, or both (County of Santa Barbara Energy Division 1989). Non-tanker vessels, such as large cargo vessels, carry large volumes of bunker fuel used

for propulsion. Bunker fuel is an extremely heavy oil, very similar to crude oil. Vessel fuel capacity ranges from 10,000 to 1.2 million gallons (NOAA 1998). The most common oil spills are those involving fewer than 50 barrels (County of Santa Barbara Energy Division 1989). Oil spill statistics for California and the United States confirm that the probability of a large oil spill is low in comparison to the amount of oil shipped. Although the probability of a large spill is low, the impact could be catastrophic due to the potential size of a spill (NOAA 1998). A corollary hazard to marine accidents is the potential for the spilled oil to ignite, creating thick smoke and soot, and hampering spill cleanup activities (County of Santa Barbara Energy Division 1989).

Oil released during a vessel accident may include fuel oil used to power the vessel and/or cargo oil. These oils behave and affect the environment in different ways. Heavier petroleum products, crude oil, and bunker fuel last longer but are less toxic. Heavy crude oil tends to be very sticky, adhering to fur, feathers, and skin of mammals and birds, and harming the environment with its physical properties. In contrast, light petroleum products typically evaporate quickly but are more toxic. Volatile compounds in oil can burn eye, nose, and mouth membranes of various marine animals. Lighter hydrocarbons (benzene, propane, and toluene) enter the bloodstream and damage red blood cells, immune system, liver, kidneys, spleen, and the reproductive organs.

Oil, however, is not the only type of hazardous cargo transported through the study area. A recent example of a toxic, non-oil accident in the Study Area was the cargo vessel *Pacbaroness*, which collided with the car carrier *Atlantic Wing* off Point Conception in 1987. A relatively small amount of fuel entered the environment, but of greater concern was the cargo of 23,233 tons of powdered copper ore, which is toxic to marine organisms.

Initial surveys of the *Pacbaroness* shipwreck were completed in 1987 and 1988. The shipwreck was not revisited until 2002, when the site was visited as part of NOAA's exploration cruise known as *Sanctuary Quest: West Coast Expedition 2002.* During the 2002 survey, abundant marine life was found around the shipwreck, indicating the presence of a diverse marine life community (CINMS 2003). Bottom sediment was observed to have built up around the shipwreck, possibly encapsulating the spilled cargo. Sediment samples were collected around the shipwreck in order to determine the extent of the copper contamination and are being analyzed (CINMS 2003).

Vessel Strikes with Wildlife

A direct result of vessel traffic is the possibility of collision with marine mammals. Although NMFS maintains records of ship strikes, many such incidents go unreported, as evidenced by the number of stranded cetaceans, pinnipeds and sea otters with obvious propeller slashes or blunt force trauma suspected to have been caused by ship strikes. Even though reporting such incidents is required in U.S. waters, few ship strike reports are actually received.

West coast stranding records have revealed ship strikes involving the following species (Caretta *et al.* 2002; Laist *et al.* 2001; NMFS 2003a; Rugh *et al.* 1999; Scarff 1986):

- Sperm whales;
- Northern right whales;
- Gray whales;
- Blue whales;

- Fin whales;
- Minke whales;
- Humpback whales;
- California sea lions;
- Pacific harbor seals;
- Northern elephant seals;
- Southern sea otters;
- Leatherback sea turtles; and
- Green sea turtles.

According to Caretta *et al* (2002), stranding records are a gross underestimate of injury and mortality. Not only do many ship strikes go unreported, but also many animals wash ashore in which ship strikes are suspected because of blunt force trauma, yet this cannot be proven. In addition, many species of whales are observed with apparent propeller slashes and other wounds consistent with ship strike, but these cannot be proven, either. In many cases, ship strikes are reported, but the species of marine mammal is not known. It is probable that ship strikes have occurred involving other species. Data from 58 well-documented ship strikes used in the first worldwide survey indicate significant impacts from ship strikes (Laist *et al*. 2001).

According to Laist *et al.* (2001), eleven species of whales have been documented worldwide as victims of ship strikes. Fin whales are hit most frequently, with right whales, humpback whales, sperm whales, and gray whales the other most common victims. Most ship strikes occur in coastal waters off the continental shelf, in areas with high concentrations of vessel traffic and whale populations.

Most vessel strikes involving pinnipeds and sea otters appear to involve small, fast boats. Propeller slashes on such animals have been proportionately small, and collision reports have come from small vessels (NMFS 2003a). Also, such animals are often concentrated in shallow coastal waters where small craft abound.

Size and speed are the most important variables in assessing the potential for a fatal collision, according to Laist *et al.* (2001). Most lethal or severe ship strikes with large marine mammals occurred with vessels over 80 meters in length. Of lethal or severe ship strikes, 89 percent were caused by ferries traveling at speeds over 12 knots, cargo ships over 14 knots, or cruise ships over 29 knots.

The majority of in-transit cargo vessels travel through the Santa Barbara Channel at speeds greater than 14 knots. During their migrations, many gray whales cross the shipping lanes, potentially needing to navigate around large commercial vessels each day. During the late summer and fall months, the Santa Rosa and San Miguel escarpment, just south of the shipping lanes, is heavily populated by blue and humpback whales. Finally, the region between the northern and southern Channel Islands is frequented by gray, blue, humpback, and fin whales. This concentration of whales and ships makes the potential for collisions between the two high throughout much of the Study Area.

NMFS data indicate that 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 (California Marine Mammal Stranding Network Database). 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. Involved in these collisions were three species of whales including: gray (4), fin (3), blue (1) and unidentified (2). (There have been no records of ship strikes with northern right whales in the CINMS or in California.) 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 that bore propeller lacerations that were assumed to have been a consequence of collisions with unidentified vessels. Whales with definite propeller slashes have stranded along the mainland coast of Santa Barbara, Ventura, and Los Angeles counties, along with whales showing massive blunt force trauma. In addition, ships have arrived in the port of Los Angeles-Long Beach with dead rorquals draped over their bows. The bulbous protuberance common to modern vessels, which juts forward underwater from the bow, apparently traps some animals as they are struck. The bulbous bow also drastically reduces the bow wake generated from such vessels, providing much less warning of a vessel's approach.

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), 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 3.5-4 below). 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, and an unusually shallow and/or dispersed aggregation of krill or simply increased local density of whales may have been contributing factors. In 2004, NMFS determined 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.[9] 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. NMFS designated the 2007 incidents as an Unusual Mortality Event (UME). A UME is defined under the Marine Mammal Protection Act as "a stranding[10] that is unexpected; involves a significant die-off of any marine mammal population; and demands immediate response." For information about the response to these ship strike incidents, including CINMS actions, see the FMP's Resource Protection Action Plan.

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

[10] 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: NMFS http://www.nmfs.noaa.gov/pr/glossary.htm#s).

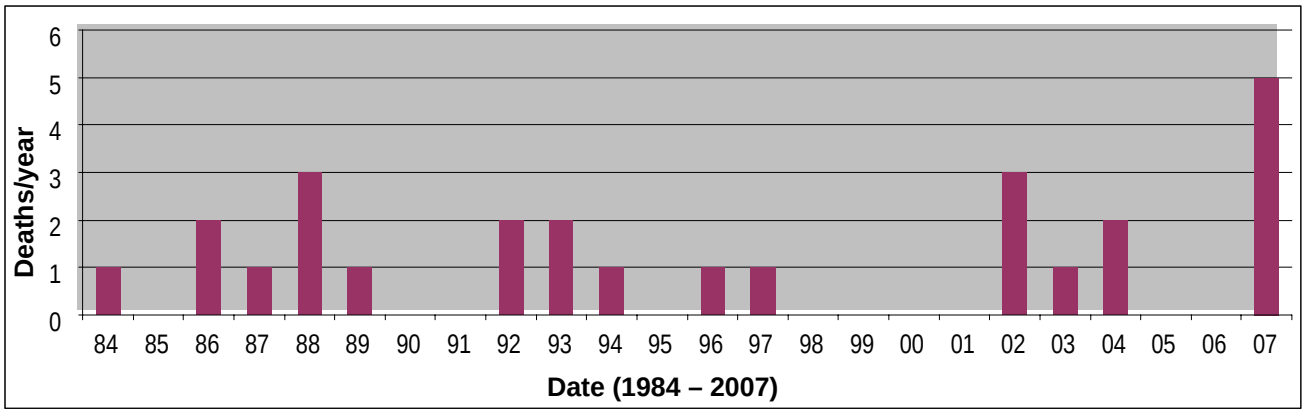

Figure 3.5-4. Number of blue whale fatalities offshore from California (1984 – 2007).

Most vessel strikes involving pinnipeds and sea otters appear to involve small, fast boats. Propeller slashes on such animals have been proportionately small, and collision reports have come from small vessels (NMFS 2003a). Also, such animals are often concentrated in shallow coastal waters where small craft abound.

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. (NMFS 2003(a)).

Vessel Air Emissions

Vessel traffic also plays a significant role in influencing air quality in the Study Area and throughout all of coastal Southern California. Emission inventory data are divided into two geographic regions in the Study Area, Santa Barbara County and the OCS. The Santa Barbara County emission inventory includes all onshore sources of air pollution in Santa Barbara County and in the state tidelands (within 3 miles of the shoreline) and is part of the South Coast Central Coast Air Basin. This basin also includes San Luis Obispo and Ventura counties. The OCS is its own air basin, and includes pollution from sources offshore of Santa Barbara County beyond the 3 mile state tideland boundary (Santa Barbara County Air Pollution Control District [SBCAPCD] 2003a).

The SBCAPCD is responsible for "implementing state and federal air pollution control laws in order to attain all ambient air quality standards and to minimize public exposure to airborne toxins and nuisance odors" (SBCAPCD 2003c). In order to accomplish this goal, the SBCAPCD issues clean air plans, adopts rules and issues permits to limit air pollution, inspects businesses to ensure compliance, monitors the County's air quality, reviews and implements new technologies to help clean the air, works with other government agencies to ensure their actions and decisions do not degrade air quality, responds to complaints and inquiries, provides information to the public, educates the public, and helps both businesses and individuals understand and comply with federal, state, and local air pollution laws (SBCAPCD 2003c).

Effective August 8, 2003, Santa Barbara County was reclassified by the U.S. EPA to attainment status for the federal one-hour ozone standard (SBCAPCD 2003b). The County had violated the federal one-hour ozone standard since 1970, when the SBCAPCD first began monitoring air quality. Since the Clean Air Act Amendments of 1977, the County has been classified in nonattainment of the federal one-hour ozone standard (SBCAPCD 2003b). In addition, the County was reclassified from a "moderate" ozone nonattainment area to a "serious" ozone nonattainment area in 1997, because although the air quality was

improving, it was not improving quickly enough. Although Santa Barbara County was reclassified to attainment status for the federal one-hour ozone standard, it is still in violation of the state ozone standard, which is stricter than the federal standard. The SBCAPCD has released a clean air "Maintenance" Plan, which shows how the County will continue to be in attainment of the federal standard, and work towards attaining the state ozone standard (SBCAPCD 2003b).

The 1999 Annual Emission Inventory for the OCS estimates that 3,033 tons per year of reactive organic gases (ROG) and 10,612 tons per year of nitrogen oxides (NO_x) were emitted (ROG and NO_x are precursors of ozone). Of the 1999 ROG emissions, 12 percent (377 tons) was from stationary sources (oil and gas production), 22 percent (651 tons) was from mobile sources (marine offshore vessels), and 66 percent (2,004 tons) was from natural sources (gas and oil seeps) (SBCAPCD 2003a). Of the 1999 NO_x emissions, 2 percent (255 tons) was from stationary sources (natural gas turbine engines involved in oil and gas production) and 98 percent (10,356 tons) was from mobile sources (marine offshore vessels) (SBCAPCD 2003a). More recent data for emissions from offshore marine vessels are also available. In 2000, marine vessels emitted 782 tons of ROG and 12,267 tons of NO_x (Petrini 2003). In 2001, marine vessels emitted 373 tons of ROG and 11,972 tons of NO_x (Petrini 2003). Although these data show a decrease in marine vessel emissions between 2000 and 2001, differences in data collection methodology likely account for these differences (Petrini 2003). The emissions data are summarized in Table 3.5-5.

Table 3.5-5. Summary of OCS Annual Emissions Generated by Marine Offshore Vessels

Year	ROG (tons/year)	NO_x (tons/year)
1999	651	10,356
2000	782	12,267
2001	373	11,972

Note: The decrease in emissions between 2000 and 2001 is likely due to differences in data collection methodology (Petrini 2003).
Sources: Petrini 2003; SBCAPCD 2003a.

As evidenced by the annual emission inventory data, offshore marine vessels generate a significant amount of air pollution in the Study Area. Engine exhaust from vessels generates ROG and NO_x, but also carbon monoxide, sulfur, and particulate matter. Cruise ships, ferries, and naval vessels also routinely incinerate non-hazardous waste such as paper and plastics (NRC 1996). Few data are available regarding shipboard incinerator emissions. Analysis of emissions from incinerators on a 2,000-passenger ferry and a 3,500-passenger cruise ship indicate that such incinerators are sources of carbon monoxide, carbon dioxide, hydrogen chloride gas, NO_x, sulfur oxides, lead, and other metals (NRC 1996). The majority of heavy metal pollutants (cadmium, copper, lead, zinc, and iron) that enter the marine ecosystem come from airborne sources (Group of Experts on the Scientific Aspects of Marine Pollution 1990); some of these heavy metals may build up in the food chain, reaching toxic levels in predators.

MARPOL Annex VI on air emissions (which entered into force on May 19, 2005) addresses shipboard incineration, but the US has not ratified it. The Coast Guard has promulgated regulations on shipboard incineration that follow International Maritime Organization guidance, but are not as stringent as MARPOL Annex VI. California State Assembly Bill 471 was signed on June 4, 2003, to prohibit cruise ships from using onboard incinerators within 90 miles of the California coast and require the vessels to burn only California highway diesel within 25 miles of the California coast. The bill was approved by the Governor on September 23, 2004 and is now part of California Health and Safety code (Division 26, Part 2, Chapter 3.3, commencing with section 39630).

Emissions from marine vessels may remain concentrated because air does not mix as well over water as over land (NRC 1996). This is because the heat flux over water is weak compared with that over land. The depth of mixing over water is relatively low, about 1,600 feet (500 meters) above low-latitude oceans. A mixing depth of about 300 feet (100 meters) was reported in studies designed to test offshore and coastal dispersion (NRC 1996). Shallow mixing depths can trap emission plumes and lead to high local concentrations of pollutants (NRC 1996).

Vessel Noise

Considerable low-frequency noise (sound below 1,000 hertz) is generated by human activities, and ships are the principal source of low-frequency anthropogenic noise in the Study Area. Some marine mammals vocalize and/or hear at lower frequencies, particularly mysticetes (whales) and pinnipeds (seals and sea lions). Most odontocetes (beaked whales) vocalize at predominately higher frequencies; however, some species may vocalize or hear at lower frequencies as well. Shipping noise is transitory in intensity, slowly building as a vessel approaches, and fading after it passes. Considering this, it is extremely unlikely that a marine mammal could suffer injury or death from such noise, since it is improbable that a marine mammal, given adequate warning, would or could remain close enough to a transitory noise to cause damage. Sudden impulse power noises, such as those generated by geophysical airguns, underwater detonations, mid- and low-frequency sonar, and pile-driving activities, can cause injury or death if the sound is sufficiently loud.

Vessel noise can affect marine animals in subtle ways, however. All marine mammals rely on sound for communication and for detecting predators and prey. In the case of odontocetes, sound is also used for echolocation. Sounds that mask communications and make it difficult to hear predators and prey can adversely impact marine mammals. Several mysticetes emit low-frequency sounds that can be heard hundreds of miles away. Pervasive low-frequency sounds generated by shipping activities can mask such communications. At closer ranges, shipping noise can be sufficiently loud to drown out higher frequency signals. Also, the frequency spectrum of shipping noise is broader near the source, meaning higher frequency sounds can be emitted as well. Small craft generally have faster turning propellers and generate sounds in higher frequencies that can mask the echolocation sounds of odontocetes at closer ranges.

Another danger from shipping noise is habituation. When animals become habituated to the incessant drone of passing ships, they no longer perceive such sounds as threats. This may explain why ship strikes occur when they would appear avoidable. Moreover, the bulbous underwater bow section of modern ships was designed to minimize the bow wake of such vessels. The smaller the bow wake, the more swiftly and efficiently a vessel can move through the water. But the smaller the bow wake, the less noise such a vessel makes. Modern ships can stretch some 400 meters in length. If the bow wake is silenced, especially when whitecaps and other natural sounds mask the sound of the bow wake, the danger may not be perceived in time. The propeller is the loudest noise source on a ship, and it can be 400 meters from the bow.

Other effects include masking of important predator-prey cues, altering migration patterns or abandonment of important habitats, and negative effects on energy and physiology (Ketten 1998; Scheifele 2000). Fish and invertebrates may experience damage to eggs, reduced reproduction rates, and physiological or morphological damage from noise impacts (Lagardère 1982; Myerberg 1990; Hastings 1991).

Vessel Discharge

Although generally no type of pollutant discharge or dumping is permitted in CINMS waters, pollutant activities that occur legally farther offshore may still negatively impact the marine ecosystems of the CINMS. The International Convention for the Prevention of Pollution from Ships (MARPOL) was created in 1973 to regulate marine debris including oil, chemicals, harmful substances in package form, and sewage and garbage, that enter the marine environment from either accidental or operational causes. Routine and often legal oil discharge is a significant marine source of oil contamination in the ocean, as much as five times greater than catastrophic, accidental oil spills. The mandatory regulations for hazardous liquid are less stringent than oil. The MARPOL annex on sewage has not been ratified, so although there is no legal discharge of untreated sewage inside CINMS, there are no restrictions on sewage discharge outside the CINMS more than 3 nmi from shore. While effects of dumping raw or under-treated sewage in smaller, closed ecosystems are better understood, the effects on large-scale ocean processes are unknown.

Disposal of food waste into CINMS waters beyond 3 nmi from land is currently allowed as long as the waste is ground up to pieces smaller than 1 inch under the Act to Prevent Pollution from Ships; this act implements MARPOL.

Two California State Assembly Bills were signed on September 24, 2003, Assembly Bill 906 and Assembly Bill 121, to prohibit cruise ships from discharging graywater and hazardous wastes into state waters and prohibit cruise ships from discharging raw sewage or treated sewage, sewage sludge, oily bilge, and ballast water into state waters, respectively.

Ballast Water Exchange and Other Management

Ballast water from ships is a major source of the introduction of non-native species. Over 80 percent of the world's commodities are transported via ships, resulting in an annual transfer of an estimated 10 to 12 billion tons of ballast water across the globe (Global Ballast Water Programme 2003). The World Resources Institute estimates that every day, 3,000 aquatic species are transported around the globe in the ballast water of ships (World Resources Institute 2003). It is estimated that between 5,000 and 50,000 exotic species have been introduced into the United States with approximately 15 percent of these species becoming established (National Invasive Species Council 2001).

Nearly 4.6 million metric tons of ballast water were discharged into California ports between January 1 and August 31, 2000. Nearly 50 percent of those vessels discharging ballast in California originated from Pacific Rim ports (*e.g.*, Japan, China, North and South Korea), while 30 percent came from Mexican ports (California State Lands Commission 2000).

Ballast water can contain four kinds of organisms: (1) plankton, (2) nekton, (3) benthos, and (4) fouling organisms. Many of these organisms are transported in their larval stages. Viruses and bacteria have also been detected in ballast water. All major and most minor phyla have been found in ballast water, averaging over 7,000 species relocating every day (Carlton 2001). Non-native species may become a new form of predator, competitor, disturber, parasite, or disease that can have devastating effects upon ecosystems. Changes in species interactions lead to disrupted nutrient cycles and altered energy flows that ripple with unpredictable results through the entire ecosystem. Section 3.5.5 describes in more detail issues associated with the release of exotic species in the CINMS.

The current technique for managing ballast water is an at-sea exchange of ballast water wherein coastal water taken at a port is replaced with less biologically productive open oceanic water. This process is not

100% effective, and can allow exotic species to survive until discharge in a foreign port or coastal area. It may also be dangerous to vessels because of loss of stability during reballasting, and should be attempted only during calm weather and oceanic conditions. Additional techniques that have been suggested include minimal or non-release of ballast water in foreign ports, and discharge to onshore reception and treatment facilities. The inadequacy of existing treatment facilities in most areas along the West coast is considered one of the main reasons this alternative is not being used by port authorities (Kimball 2001).

3.5.3.2 Large Vessel Sewage and Graywater Discharge/Deposit

Sewage and Sewage Treatment

Sewage (also referred to as blackwater) means human body wastes and the wastes from toilets and other receptacles intended to receive or retain body wastes. Sewage from vessels is generally more concentrated than sewage from land-based sources, as it is diluted with less water when flushed (three quarts versus three to five gallons).

Vessel sewage discharges may introduce disease-causing microorganisms (pathogens), such as bacteria, protozoans, and viruses, into the marine environment (EPA 2007). Untreated or under treated sewage from vessels can cause bacterial and viral contamination in commercial and recreational shellfish beds, posing risks to public health (Herz and Davis 2002). High concentrations of nutrients in sewage, namely nitrogen and phosphorous, can lead to eutrophication, the process by which an aquatic environment becomes rich in dissolved nutrients, causing excessive growth and decomposition of oxygen-depleting plant life, and resulting in injury or death to other organisms. In addition, marine sanitation device (MSD) treatment and deodorant chemicals such as chlorine, ammonia, and formaldehyde can present a threat to marine organisms (California Department of Boating and Waterways 2007). The environmental effects of dumping raw or under-treated sewage in smaller, closed ecosystems such as lakes are better understood than the effects on large-scale ocean processes, which remain poorly characterized. (Davenport and Davenport 2006).

Marine Sanitation Devices

The Federal Water Pollution Control Act, also informally called the Clean Water Act or CWA (33 U.S.C. 1251 *et seq*.), requires that any vessel with installed toilet facilities must also have an operable MSD. Three general types of MSDs are available and in use. Type I and II MSDs treat the wastewater and discharge it post-treatment.

Type I MSDs rely on maceration and disinfection for treatment of the waste prior to its discharge into the water, and are only legal in vessels under 65 feet in length. Effluent from Type I MSDs may not have a fecal coliform count greater than 1,000 per 100 milliliters, nor visible floating solids. Type II MSDs provide an advanced form of the same type of treatment used by Type I devices, and discharge wastes with lower fecal coliform counts and reduced suspended solids. Effluent from Type II MSDs may not have a fecal coliform count greater than 200 per 100 milliliters, nor suspended solids greater than 150 milligrams per liter. Type II MSDs are legal in any size class of vessel, and there are a variety of different types (U.S. EPA 2006b.). NOAA's assessment of data collected by California pursuant to California Senate Bill 771 indicates that as of 2006, approximately 75% of the large oceangoing ships that called on California ports were using a Type II MSD.

There are three basic varieties of MSD treatment systems: biological, macerator/chlorinator, and advanced. MSDs with biological systems clarify wastewater by allowing solids to settle, then use aeration to encourage biological growth that feeds on the organic waste. These biological systems use either chlorine or ultraviolet light for disinfecting the final discharge. MSDs with macerator/chlorinator

systems dilute the wastewater about 10:1 with ambient seawater, then a macerator pump breaks up any solids. An electrochemical cell generates chlorine from seawater, which is used for final disinfection. MSDs with advanced treatment systems treat the wastewater using a biological process followed by ultrafiltration or reverse osmosis filtration. The advanced treatment systems then use either chlorine or ultraviolet radiation to kill bacteria. (Alaska Department of Environmental Conservation 2002.)

U.S. Coast Guard standards for MSDs that are currently in effect have not changed since 1976. As would be expected, treatment technology has advanced since that time and MSDs are available that outperform these standards (Types IA and II). A House bill was under review in 2002 (H.R. 3673) that would raise the standard for Type I MSDs to 100 times stricter than at present. This bill stalled in committee in 2003, so the new standard was never put in place.

Type III MSDs, commonly called holding tanks, flush sewage from the marine head into a tank that may contain deodorizers and other chemicals, predominantly chlorine. The contents of the holding tank are stored until they can be properly disposed of at a shore-side pump-out facility, or discharged offshore in a legal area. Storing wastewater in holding tanks can increase fecal coliform counts, and total suspended solids (Alaska Department of Environmental Conservation 2001, 2004a). Type III MSDs can be equipped with a discharge option, usually called a Y-valve, which directs the sewage into either the holding tank or directly overboard. Based on NOAA's assessment of SB 771 survey data Type III MSDs are the type of system present in approximately 10% of large oceangoing ships that called on California ports in 2006.

Sewage holding tank capacities for large vessels are highly variable, and data on these capacities has only recently begun to be collected. The State Water Board staff's preliminary review of the 2006 SB 771 survey data found that 47% of large oceangoing ships report having sufficient holding tank capacity to hold blackwater while within marine waters of the state (State Water Resources Control Board 2006, personal communication with R. Jauregui). This data set relies on submission of accurate data from ship owners and captains.

Much of the research on wastewater discharge from large vessels has focused on the dilution effect of moving vessels. Loehr *et al.* (2006) reviewed the available literature and concluded that for a cruise ship traveling at six knots, the dilution effect is so large that there is no chance its effluent could exceed water quality standards. Although stationary discharges have a much greater chance of impact since the dilution effect is dramatically lower, researchers found that for stationary large cruise ships the dilution effect remained high enough to avoid exceeding water quality standards. However, it was suggested that smaller ships would risk exceeding those standards due to their lower specific dilution factor. It is important to note that many of the dilution studies reviewed in Loehr *et al.* (2006) only considered effluent from properly functioning MSDs, which is not necessarily the condition of MSDs on all or most vessels. Voluntary samples taken in 2000 at the inception of the Alaska Cruise Ship Initiative revealed that the effluent from large (250 or more passengers) passenger vessel MSDs was often in excess of federal standards for fecal coliform and other pollutants (Alaska Department of Environmental Conservation 2001). These findings led to the establishment of a monitoring program that, following the passage of more stringent federal and state laws regulating cruise ship wastewater discharge in Alaska, saw significant improvement in the MSD discharges subsequently measured (Alaska Department of Environmental Conservation 2004a). In the absence of a monitoring program, it is difficult to say whether the MSDs on board vessels operating in California waters are operating as effectively as intended. Consequently, for large vessels in California waters the dilution effect may not necessarily yield the results described above.

The chemicals and deodorants often used in MSDs, including chlorine, ammonia, or formaldehyde, have the potential to impact water quality. Such treatment chemicals are often not measured under typical "water quality" monitoring programs. When chlorine mixes with seawater bromides, the resultant compounds are referred to as chlorine-produced oxidants, or CPO's. This is the analog to Total Residual Chlorine, or TRC, which is used in freshwater systems. Acute CPO toxicity values are available for a range of saltwater invertebrate and vertebrate species, and are especially low for larval forms (EPA 1985). Long term toxic limits are even lower for all tested species. Due to these low tolerances to CPO, NOAA is concerned about the chlorine concentrations that are often observed in discharges from cruise ship sewage treatment systems and cruise ship untreated graywater (EPA 2007).

Cruise Ships in the Sanctuary Discharge Volume

Given that cruise ships travel at between 15 to 20 knots, they should only be in Sanctuary waters for approximately one hour when transiting north in the TSS, and approximately two to two-and-a-half hours when transiting south in the TSS. Cruise ships typically have sufficient storage capacity for blackwater to allow vessel operations for between one to two days, although there is significant variation among vessels (Pruitt 2004). The installation of advanced wastewater treatment systems reduces the holding capacity by varying degrees, as these systems normally occupy space formerly used for holding.

Estimates of blackwater production from large cruise ships range from a low of 5-7 gallons per person per day to a high of 17 gallons per person per day (EPA 2006c, d, e, f). The volume of treated blackwater generated and discharged varies considerably from ship to ship and region to region. Much of the variation depends on the treatment process.

Cruise ships can produce and discharge extensive sewage wastes on par with some small cities, yet they are not subject to the same environmental regulations and monitoring requirements that land based facilities are required to comply with, such as obtaining discharge permits, meeting numerous permit conditions, and monitoring effluent discharges (NOAA 2003c). California is pursuing authority to prohibit discharges of sewage and sewage sludge from all large passenger vessels and oceangoing ships within state waters (water located within three miles of the California coastline). This prohibition, however, would not afford protection to Sanctuary waters outside of California state water boundaries. (See FEIS sections 3.5.3.4, and 5.2 for additional information on rules and regulations pertaining to vessel discharges and deposits.)

Cruise Ships Discharge Violations and Agreements

There is a history of cruise ships violating discharge regulations and agreements, and exceeding discharge standards (Alaska Department of Environmental Conservation 2006; GAO 2000). Although since 2000 (GAO 2000) an updated listing of cruise ship discharge violations involving sewage does not appear to be published or available from regulators or other agencies, a review of available news stories provides limited information on some such incidents in Table 3.5-6 below.

At the same time, certain, but not all, cruise line companies have agreed to voluntary pollution reduction measures. Because these measures are voluntary they are not required or enforced, and compliance with them (or lack thereof) is not monitored or verified. Voluntary measures include using equipment that treats the oily bilge water above regulatory requirements to 5 parts per million, or ppm (NOAA 2003a, 2003b, 2003c). Some cruise lines have even adopted a "no discharge in marine protected areas" policy whereby they agree to hold all discharges until they are outside marine protected area boundaries.

Table 3.5-6. Various cruise ship discharge violations involving sewage.

Date	*Vessel name*, Cruise Line	Location	Type of violation
November 2006	*Mercury*, Celebrity Cruises	Puget Sound, Washington	Untreated wastewater
May 2003	*Norwegian Sun*, Norwegian Cruise Line	Strait of Juan de Fuca, Washington	Sewage discharge
October 2002	*Crystal Harmony*, Crystal Cruises	Monterey, California	Sewage, bilge, and graywater discharge
August 2002	*Ryndam*, Holland America Line	Juneau Harbor, Alaska	Sewage discharge
May 2001	*Norwegian Sky*, Norwegian Cruise Line	Alexander Archipelago, Alaska	Sewage discharge
February 1995	*Star Odyssey*, Norwegian Cruise Line	Southwest Pass, Louisiana	Oil and sewage spill
March 1993	*Seaward*, Norwegian Caribbean Cruise Line	Georgetown, Grand Cayman Island	Sewage
March 1992	*Seaward*, Norwegian Caribbean Cruise Line	Georgetown, Grand Cayman Island	Sewage

Note: This is not a comprehensive listing.
Sources: GAO 2000 and www.cruisejunkie.com/envirofines.html.

Additionally, Cruise Lines International Association, Inc. (CLIA) members agree that ships regularly traveling outside of coastal states' territorial waters will not discharge blackwater (sewage) within four miles of shore. When outside four miles of shore, they agree not to discharge unless the vessel is underway at six knots or more. They also agree to pass all blackwater through a MSD (certified according to U.S. or international law) prior to discharge. Those vessels using an Advanced Wastewater Purification System are not obliged to follow this voluntary agreement. This organization does not include all cruise ship operators so these agreements are not universally followed. (CLIA 2006a) More information about CLIA is available at www.cruising.org.

Within the Monterey Bay National Marine Sanctuary (MBNMS), three cruise lines voluntarily adopted a no-discharge policy. In October 2002, however, the cruise ship Crystal Harmony visited Monterey and discharged treated wastewater, graywater and processed bilge water into the Sanctuary, breaking the voluntary no-discharge agreement the cruise line had made with the City of Monterey and the MBNMS. Subsequently, in 2004, prompted by this incident, the State of California passed legislation to limit the water and air pollution generated by cruise ships in California waters (AB 471, AB 2093, and AB 2672) (See FEIS sections 3.5.3.4, and 5.2 for more information on federal and state laws regulating vessel discharge).

Alaska Cruise Ship Sewage Discharge Data

As referred to above, in 2000 the Alaska Cruise Ship Initiative collected wastewater samples voluntarily provided by 21 large passenger vessels. The goal of this sampling effort was to characterize wastewater quality and determine if hazardous substances were discharged to receiving water through wastewater systems (Alaska Department of Environmental Conservation 2004a). Results of this sampling effort indicated that treated wastewater discharged from MSDs was often in excess of federal standards for fecal

coliform and other pollutants (Alaska Department of Environmental Conservation 2004a). According to the Alaska Department of Environmental Conservation (2001), "The results of analyses of treated blackwater clearly demonstrated that generally MSDs do not meet the federal standards for TSS [or total suspended solids] and fecal coliform."

The samples collected from large cruise ships (250 passengers or more) in 2000 yielded the following results:

- There was no evidence of hazardous wastes being mixed with overboard discharges;
- Seven metals (chromium, copper, lead, mercury, zinc, silver and nickel) were present in levels above Alaska's water quality standards for aquatic life;
- One blackwater sample out of 70 met both the fecal coliform and total suspended solids standards;
- Approximately 57% of the fecal coliform samples exceeded the federal Type II MSD standard of 200 fecal coliform per 100 milliliter of sample; and
- 68% of the samples for total suspended solids exceeded the federal Type II MSD standard of 150 milligrams per liter of sample (Alaska Department of Environmental Conservation 2001).

According to the Alaska Department of Environmental Conservation (2002), "The 2000 large ship data shows that none of the conventional biological treatment systems were functioning properly."

Whereas Alaska's 2000 sampling program focused on characterizing wastewater quality, the purpose of subsequent sampling has shifted to assessing compliance with recent federal (P.L. 106-554)[11] and state (AS 46.03.460 – 46.03.490)[12] legislation aimed at improving the quality of cruise ship wastewater discharged offshore from Alaska. In essence, these laws and implementing regulations combined provide strict standards for both sewage and graywater discharges from cruise ships in Alaskan waters (and sewage in federal waters of the Inside Passage), and require sampling and testing to demonstrate that ships are meeting the requirements. Although the Alaska Department of Environmental Conservation (2004a) determined that 2001-2002 samples were less representative of large cruise ship wastewater discharges than samples taken in 2003 and beyond (due largely to differences in sampling methods), there is a dramatic decrease in fecal coliform and total suspended solids between large cruise ship samples taken prior to the new legislation, and large cruise ship samples taken after it, as demonstrated in Tables 3.5-7 and 3.5-8 below.

[11] "Title XIV--Certain Alaskan Cruise Ship Operations" of the Miscellaneous Appropriations Bill (H.R. 5666) passed on December 21, 2000 in the Consolidated Appropriations Act of 2001 (P.L. 106-554). The law applies to large commercial passenger vessels only, defined as those vessels having more than 500 passengers, and sets effluent standards for blackwater. A helpful summary of Title XIV is on the U.S. EPA website at http://www.epa.gov/owow/oceans/cruise_ships/sewage_gray.html (last accessed June 1, 2007). Title XIV implementing regulations took effect in July 2001 (33 CFR 159.301-159.321).

[12] See: State Of Alaska, Title 46. Water, Air, Energy, and Environmental Conservation, Chapter 46.03, Environmental Conservation, Article 07: Commercial Passenger Vessel Environmental Compliance Program. This state legislation became effective on July 1, 2001, and its implementing regulations (18 AAC 69) took effect on November 15, 2002.

Table 3.5-7. Mean fecal coliform and median total suspended solids from large cruise ship (250 passengers or more) treated blackwater samples in Alaska.

		Pollutants in Large Cruise Ship Treated Wastewater Samples by Year			
	CWA MSD Requirement	2000	2001	2002	2003
fecal coliform/100 ml	**200**	18,213	2*	5	1
TSS in mg/l	**150**	407.0	0.7*	0.1	0.0

Note: adapted from tables in Alaska Department of Environmental Conservation (2004a).
*Denotes that samples were mixed graywater and blackwater, which is considered blackwater.

Table 3.5-8. Median fecal coliform and median total suspended solids from large cruise ship (250 passengers or more) wastewater (graywater and blackwater not distinguished) samples in Alaska.

		Pollutants in Large Cruise Ship Treated Wastewater Samples by Year	
	CWA MSD Requirement	2004†	2005‡
fecal coliform/100 ml	**200**	1	0
TSS in mg/l	**150**	2	0

Note: 2006 data were not available as of the date of development of this FEIS.
†Adapted from Table 1 in Alaska Department of Environmental Conservation (2004b).
‡Adapted from Table 1 in Alaska Department of Environmental Conservation (2005a).

Since the passage of the new federal and Alaska laws, most large cruise ships discharging in Alaska waters have installed advanced treatment systems, dramatically improving the quality of effluent discharged. In 2001, 21 of 24 large cruise ships stopped discharging blackwater in Alaska water, and two of the three ships that continued to discharge blackwater in Alaska waters had advanced wastewater treatment systems. This explains the dramatic decrease in fecal coliform levels seen between 2000 and 2001 (Table 3.5-7). The only large ships discharging blackwater in Alaska in 2002 and 2003 also had advanced wastewater treatment systems. The percentage of large cruise ships operating in Alaska with advanced treatment systems went from 8% in 2001, to 28% in 2002, and 56% in 2003. (Alaska Department of Environmental Conservation 2004a.)

The Alaska sampling program also samples for and analyzes other wastewater parameters for large cruise ships, as well as for small cruise ships (50 to 249 passengers). The Alaska Cruise Ship Initiative determined that even with the dilution factor, a stationary blackwater and/or graywater discharge from a large cruise ship prior to passage of Alaska cruise ship law would not have met Alaska Water Quality Standards for free chlorine, fecal coliform, or copper in the receiving water. However, due to the dilution factor, Alaska Water Quality Standards would have been met in the receiving water for all measured parameters except fecal coliform, by large cruise ships discharging while underway. For small cruise ships in Alaska sampled between 2001 and 2003, all of which use traditional treatment, the quality of

effluent remained relatively consistent. Vessels discharging underway in Alaska are required to travel at a minimum of six knots. (Alaska Department of Conservation 2004a.)

On January 1, 2004 small cruise ships were required to comply with the wastewater discharge standards in Alaska for blackwater, graywater, and other wastewater: no more than 200 fecal coliform per 100 milliliter sample, and no more than 150 milligrams total suspended solids per liter of sample. In 2004 and 2005 most small cruise ships sought alternative terms and conditions (allowed under Alaska state law), as they were not able to meet the standard wastewater discharge terms and conditions, and because the advanced treatment systems present on large cruise ships were not yet commercially available for small ships. (Alaska Department of Environmental Conservation 2005b.)

In the absence of a vessel discharge monitoring program like that for cruise ships operating in Alaska, there is no comprehensive data available indicating the makeup of blackwater discharged by large cruise ships (or oceangoing ships) in California. The results of cruise ship blackwater samples taken in Alaska indicate that blackwater from vessels without advanced treatment systems and not subject to mandatory monitoring, inspection, and reporting, may contain levels of fecal coliform and total suspended solids that exceed federal standards for MSDs, as well as a variety of other pollutants. The advanced treatment systems used by large cruise ships that discharge blackwater in Alaska are not required to be used by large vessels under any federal law.

Large Vessel Graywater Discharge

The proposed CINMS definition of "graywater" to be added to the National Marine Sanctuary Program regulations at 15 CFR 922.71 would read as follows: "Graywater means galley, bath, or shower water."[13] Graywater can contain a variety of substances including (but not limited to) detergents, oil and grease, pesticides, and food wastes (Eley 2000). More than one million gallons of graywater are produced on a typical 7-10 day cruise ship voyage, making it by far the largest source of liquid waste on a cruise ship (Sweeting and Wayne 2003). As a general rule, large cruise ships generate 180 liters (50 gallons) of graywater per person per day. The average large cruise ship with 2,500 passengers and crew onboard produces 211,200 gallons of wastewater per day, and 90 – 95% of this wastewater is graywater (Alaska Department of Environmental Conservation 2004a). The average small cruise ship with 100 passengers and crew onboard produces 2,500 gallons of wastewater per day (Alaska Department of Environmental Conservation 2004a). The volume of graywater generated and discharged varies considerably from ship to ship and region to region. Much of the variation depends on the treatment process.

Similar to sewage, graywater holding tank capacities for large vessels are highly variable, and data on these capacities have only recently begun to be collected. Cruise ships typically have sufficient storage capacity for graywater to allow vessel operations for between one to two days, although there is significant variation among vessels (Pruitt 2004). The installation of advanced wastewater treatment systems reduces the holding capacity by varying degrees, as these systems normally occupy space formerly used for holding. The State Water Board staff's preliminary review of the 2006 SB 771 survey data found that as little as 20% of large oceangoing ships have sufficient holding tank capacity to hold graywater while within marine waters of the state (State Water Resources Control Board 2006, personal communication with R. Jauregui). This data set relies on submission of accurate data from ship owners and captains. Furthermore, many oceangoing ships were designed without the ability to retain graywater, particularly those constructed prior to the early 1990s (personal communication, S. Young, U.S. Coast Guard). While many of these older ships, particularly those calling on U.S. ports, have since been

[13] This definition is based on section 312 of the CWA (33 U.S.C. 1322). While other discharges, such as those from laundry facilities, are not included in this graywater definition, they would be prohibited by the Sanctuary discharge regulation.

modified to allow graywater retention, some must still discharge graywater directly as it is produced (personal communication, S. Young, U.S. Coast Guard).

Cruise Lines International Association, Inc. (CLIA) members agree that ships traveling regularly on itineraries beyond the territorial waters of coastal states: will only discharge graywater while underway and proceeding at a speed of not less than 6 knots; will not discharge graywater in port; will not discharge graywater within four nmi from shore (or such other distance as agreed to with authorities having jurisdiction or provided for by local law except in an emergency, or where geographically limited). Member lines have further agreed that the discharge of graywater will comply with all applicable laws and regulations and, for vessels whose itineraries are fully within U.S. territorial waters, discharge will comply fully with U.S. and individual state legislation and regulations. (CLIA 2006a) This organization does not include all cruise ship operators so these rules are not universally followed or enforced. More information about CLIA is available at www.cruising.org.

Graywater is usually not treated. Some vessels mix graywater with blackwater where it gets treated in the blackwater treatment system or advanced treatment system. Some vessel operators add chlorine to their graywater collecting tanks to achieve some level of bacteria reduction. Although chlorine is effective for disinfecting, excessive chlorine residual may be toxic to marine life (Alaska Department of Environmental Conservation 2002).

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). The high nutrient levels found in graywater, particularly nitrogen and phosphorus, can contribute to eutrophication processes where algal growth is rapidly stimulated. This increase in algal growth can significantly decrease oxygen levels, impacting the use of coastal waters for recreational and commercial fishing (Schmidt and Long 2000).

Because neither federal nor state laws require monitoring of graywater effluents from large vessels operating in California waters, there is no comprehensive data available indicating the makeup of graywater discharged by large vessels in California. Furthermore, unlike sewage effluents, graywater effluents are not subject to federal standards for bacteria and other pollutants. However, as described in more detail under 3.2.1.1 and 3.2.1.2 above, in 2000 the State of Alaska began collecting wastewater samples from cruise ships operating in Alaskan waters. In the absence of similar monitoring in California waters, the results of the 2000 large cruise ship voluntary graywater sampling in Alaska may provide insight into the makeup of graywater effluents from cruise ships not previously subject to such monitoring, and not required to meet any water quality standards for graywater effluent.

The samples collected from large cruise ships (250 passengers or more) in 2000 yielded the following results:

- No evidence of hazardous wastes being mixed with overboard discharges;
- Seven metals (chromium, copper, lead, mercury, zinc, silver and nickel) present in levels above Alaska's water quality standards for aquatic life;
- 78% of graywater samples contained fecal coliform levels exceeding the federal standard for Type II MSDs of 200 fecal coliform per 100 milliliters of sample;
- 14% of graywater samples exceeded 10,000,000 fecal coliform per 100 milliliters; and

- 40% of graywater samples exceeded the federal standard for Type II MSDs of 150 milligrams per liter of total suspended solids (Alaska Department of Environmental Conservation 2001).

Based on these results, the Alaska Department of Environmental Conservation (2001) concluded:

> Graywater is not expected to contain pollutant levels as high as blackwater. The results indicated that graywater being discharged was not benign… graywater is similar to blackwater in number of fecal coliform bacteria and total suspended solids, and that graywater should be treated prior to discharge.

Alaska's sampling results for fecal coliform and total suspended solids from large cruise ships between 2000 and 2003 are summarized in Table 3.5-9.

Table 3.5-9. Mean fecal coliform and median total suspended solids from large cruise ship (250 passengers or more) samples taken in Alaska.

	Pollutants in Large Cruise Ship Graywater Samples by Year, and Source					
	2000			2001		
	A&L	G	M	A&L	G	M
Fecal coliform/100 ml	6 – 104	13,750	118,052 - 1,163,188	30 – 651,460	402* – 784,072	38,933 – 649,994
TSS in mg/l	39.0 – 455.0	223.5	92.0 – 250.0	22.0 – 66.0	266.0 – 383.0	76.5 – 151.3

	2002			2003
	A&L	G	M	graywater
Fecal coliform/100 ml	47,357	6,279	38,603	7
TSS in mg/l	130.5	1,320.0	190.0	0.0

A&L = accommodations and laundry; G = galley; M = mixed graywater

Notes: adapted from tables in Alaska Department of Environmental Conservation (2004a).
*Some samples were not analyzed.

Table 3.5-9 shows ranges for mean and median values where there were multiple sets of samples, each with its own mean or median values, for graywater from accommodations and laundry, galley, and mixed sources. Between 2000 and 2002 graywater samples sets consisted of accommodations and laundry (separate and/or combined), galley samples from double bottom tanks and/or from collecting tanks, and mixed graywater samples from double bottom tanks and from collecting tanks. Between 2000 and 2002 the Alaska sampling data for large cruise ships indicates very high levels of fecal coliform in graywater (well exceeding federal standards for fecal coliform from Type II MSDs of 200 fecal coliform per 100 milliliter sample), and high mean total suspended solids from at least one graywater source per year (exceeding the federal standards for total suspended solids from Type II MSDs of 150 milligrams per liter). The drastic reduction in fecal coliform and total suspended solids in the 2000-2002 graywater samples and the 2003 graywater sample is due to two factors. First, in 2003 graywater discharged by large cruise ships in Alaska waters became subject to Alaska's effluent standards. Second, in 2003 only one ship discharged graywater in Alaska and this ship treated its graywater using an advanced wastewater treatment system. (Alaska Department of Environmental Conservation 2004a.)

Alaska sampled small cruise ship (50 to 249 passengers) graywater discharges beginning in 2001. These samples had mean fecal coliform values of 103 (2001), 222 (2002; data skewed by one unusually high

sample), and 48 (2003). They had median total suspended solids values of 49.6 (2001), 54.1 (2002), and 55.6 (2003).

Table 3.5-10 below presents a presence/absence listing of a range of pollutants found in cruise ship graywater as monitored in Alaska. Measurements were taken during the years of the inception of the sampling program (2001-2002) and during a more recent sampling year (2005). Sampling for these pollutants continues on an annual basis, although results for graywater sampling are not always reported separately from blackwater. For the table below, only those samples identified as being solely graywater are included, which precludes the 2005 measurements from the large vessel class. For more information about the pollutant levels and analysis see Alaska Department of Environmental Conservation (2004, 2005a, 2005b).

Table 3.5-10. Summary of pollutants found in Alaska Department of Environmental Conservation passenger vessel wastewater sample data.

	Samples from Two Size Classes of Passenger Carrying Vessels		
Pollutant	**50 – 249 passengers**		**250 or more passengers**
	2002	2005	2001
3&4-Methylphenol		✓	
2-chlorophenol		✓	
Acetone	✓		
Antimony	✓		
Arsenic	✓	✓	
Benzoic acid	✓	✓	
Bis (2-ethylhexyl) phthalate			✓*
Bromoform	✓		✓*
Butylbenzyl phthalate			✓
Chloroform	✓	✓	✓*
Chromium		✓	✓
Copper	✓	✓	✓*
Diethyl phthalate	✓		✓
Lead		✓	✓*
Nickel		✓*	✓*
Phenol		✓	
Selenium	✓	✓	✓*
Zinc	✓	✓*	✓*

Note: data from Alaska Department of Environmental Conservation (2002, 2005a,b).
*Denotes that the pollutant was found in all sample sets.

Since more stringent regulation of cruise ship wastewater discharges in Alaska there have been positive results with respect to monitored pollutants. Of twenty-nine cruise ships with 500 or more overnight passengers that visited Alaska in 2005, twenty discharged into state waters and were subject to unannounced sampling requirements pursuant to federal and state law (see footnotes 17 and 18). For many of the pollutants identified in Table 3.5-10, acceptable limit standards do not exist, so it is difficult to say whether the levels identified in Alaskan vessel waste streams have the potential to cause harm. The

levels of ammonia and dissolved metals like copper, nickel and zinc have been identified as being of most concern (Alaska Department of Environmental Conservation 2004). A report by the Alaska Department of Environmental Conservation (2006) summarizes the more recent sampling results as follows:

> Advanced wastewater treatment systems continue to be effective at removing bacteria and suspended solids. Chlorine concentrations of large ships effluent has declined from past seasons to below detection levels. Some large ships wastewater discharges have ammonia, dissolved copper, dissolved nickel and dissolved zinc results that exceed Alaska water quality standards. Most of these standards will be met quickly in the receiving water because the effluent is dispersed and should not pose a risk to the environment.

In the absence of a vessel discharge monitoring program like that for cruise ships operating in Alaska, there is no comprehensive data available indicating the makeup of graywater discharged by large vessels in California. However, initial monitoring results of cruise ship graywater discharges in Alaska indicate that graywater from vessels not accustomed to monitoring may contain levels of fecal coliform that exceed federal standards for MSDs, along with a variety of pollutants.

In a draft report, EPA (2007) summarizes the available data on graywater discharge by stating:

> Pathogen indicator data from untreated graywater consistently exceed the NRWQC [or National Recommended Water Quality Criteria] for marine water bathing and shellfish harvesting waters (see Table 3-10). Over 66% of EPA samples for enterococci exceeded the 35 MPN/100 mL standard for marine water bathing. Over 80 percent of ACSI/ADEC samples for fecal coliform exceeded the 43 MPN/100 mL standard for harvesting shellfish. Given the consistent exceeding of the NRWQC for bacteria, untreated graywater may cause, have the potential to cause, or contribute to non-attainment of water quality standards in a given receiving water.

3.5.3.3 Harbors

Santa Barbara Harbor

Santa Barbara Harbor, built in 1926, is a 1,133-slip harbor used primarily by fishing, commercial, and recreational vessels. It is a popular destination for recreational boaters, fishermen, and tourists. The harbor offers a number of boating services including maintenance, hull cleaning, repairs, and towing (Santa Monica Bay Restoration Project [SMBRP] 2000).

Santa Barbara Harbor Patrol officers provide security and law enforcement services to the waterfront area. Using boats, patrol vehicles, and foot patrols, they monitor all areas several times each day. The Harbor Patrol enforces the California Boating Law. This law addresses the equipment and operation of boats. The Harbor Patrol also assists other agencies within the waterfront area with the enforcement of laws including camping, parking, drinking, and drug laws. Security of the harbor and marinas is maintained by regular foot, vehicle, and boat patrols over the entire area, which consists of 84 acres of water and 40 acres of land.

Vessels providing routine services to the offshore oil and gas industry typically do not use Santa Barbara harbor to load or unload personnel, supplies, or equipment, but they may refuel there. Vessels belonging to the Clean Seas Oil Spill Response Cooperative are anchored east of Stearns Wharf at the Santa Barbara Harbor (MMS 1999).

Ventura Harbor

Ventura Harbor is located approximately 65 miles northwest of Los Angeles. Since its opening in 1963, the harbor has increased in size so that it now encompasses 152 acres of land, 122 acres of water, and contains 1,375 slips. This small harbor is used primarily by small recreational and commercial vessels and provides several services and outdoor activities. Its proximity to the Channel Islands makes it an excellent point of origin for day or extended trips (SMBRP 2000). Although it is used primarily by recreational and commercial fishing vessels, Ventura Harbor does offer berths for some supply and work vessels that service offshore platforms (MMS 1999).

Channel Islands Harbor

Channel Islands Harbor is located in Oxnard, halfway between Ventura Harbor and Port Hueneme. With nine marinas and four yacht clubs, the harbor is home to more than 2,800 recreational and commercial vessels. Channel Islands Harbor is the closest harbor to the Channel Islands, making it a convenient location for day or extended trips. Public facilities and services include laundry rooms, restrooms and showers, picnic areas, marine supplies, and maintenance and repair shops (SMBRP 2000). Vessels associated with the offshore oil and gas industry typically do not use Channel Islands Harbor (MMS 1999).

Port Hueneme

Port Hueneme, the only deep water port between Los Angeles and San Francisco, is used by commercial ships to load and unload goods. It is also used by supply and crew vessels that service offshore platforms (MMS 1999).

Commodities shipped through the port include bananas and other fruit, automobiles, oil products, lumber, fish, livestock, wood pulp, liquid fertilizer, and other agricultural products. The Port of Hueneme is the import center for Mazda automobiles in Southern California. Mercedes Benz, BMW, Jaguar, Range Rover, and Mitsubishi Corporations also import stock through the port. Oil products, which are available for ship operation from the port, come in through barges at least quarterly (Ortiz 1999). The Port of Hueneme serves as the principal staging area for supplies, equipment, and crews for the oil platforms located in the Santa Barbara Channel. The port also handles a small amount of fuel oil for Southern California Edison Company. The newest commodity to be imported through the port is liquid fertilizer, which comes in bulk tankers (Ortiz 1999).

3.5.3.4 Regulatory Setting

Vessel discharges are regulated through a framework of overlapping international treaties and standards, national laws and regulations, and local and area-specific rules. In general, the purpose of such rules and regulations is to protect water quality. The key regulations described below apply to ballast water, sewage and graywater discharges. A host of other international, national, state and local rules and regulations also apply to other types of vessel discharges. For additional information on rules and regulations pertaining to all types of vessel discharges and deposits please refer to section 5.2 of the FEIS.

Ballast Water Exchange and Other Management

There are a number of international, national and state regulations in place with respect to ballast water exchange.

The International Maritime Organization (IMO) was created by the United Nations in 1958 as a central clearinghouse for maritime issues. The IMO's Resolution A.868(20), adopted in 1997, and entitled *Guidelines for the Control and Management of Ships' Ballast Water to Minimize the Transfer of Harmful Aquatic Organisms and Pathogens* suggests a number of policies to prevent the release of ballast water and discharge of exotic species in ports. These guidelines, however, are not legally binding.

The National Invasive Species Act of 1996, 16 U.S.C. 4701 *et seq*., which was amended by the Non-Indigenous Aquatic Nuisance Prevention and Control Act (1999), supports a ballast water management program that aims to prevent the introduction and spread of exotic species into the EEZ by introducing preventive strategies and management techniques. Section 1101(c)(1) (16 U.S.C. 4711(c)(1)) of this act establishes voluntary guidelines to prevent exotic species introductions. Section 1101(c)(2)(D) (16 U.S.C. 4711 (c)(2)(D)) directs any vessel carrying ballast water into the EEZ of the United States to exchange ballast water outside the EEZ or to other waters where the exchange will not pose a threat of infestation to United States waters or apply sound alternative ballast water management methods.

The U.S. EPA Ballast Water Report (U.S. EPA 2002) summarizes the results of a study on aquatic nuisance species in ballast water discharges, and recommends actions to address the issue. The report suggests that the greatest barrier to effectively preventing the threats posed by exotic species is the lack of effective and affordable technologies for treating ballast water (U.S. EPA 2002).

In addition, the U.S. District Court for the Northern District of California on March 30, 2005 held that discharge of ballast water within three miles from shore is discharge of a pollutant and therefore requires a National Pollutant Discharge Elimination System (NPDES) permit. The court ordered EPA to repeal its regulation exempting ballast water from its NPDES permit program (Northwest Environmental Advocates *et al* v. EPA, 35 Envtl. L. Rep. 20,075).

The State Lands Commission is collaborating with the State of Washington to develop an interstate approach for ballast water treatment systems for the shipping industry. The following California Resource Agency regulations address issues associated with ballast water management:

- Fish and Game Code; section 6430-6433; Ballast Water Management Program;
- Harbors and Navigation Code; section 132: Ballast Water;
- Public Resources Code; section 30260-30265.5: Ballast water from tankers;
- Public Resources Code; section 30707: Ballast water from tankers;
- Public Resources Code; section 71200-71202: Ballast water;
- Public Resources Code; section 71203-71207: Ballast water management practices;
- Public Resources Code; section 71210-71213: Ballast water;
- Public Resources Code; section 71215: Exotic species control fund; and
- Public Resources Code; section 71216: Ballast water reporting violations.

In addition, the West Coast Regional Applied Ballast Water Management Research and Demonstration Project is currently involved in research on ballast water issues. The following recent state laws regulate ballast water exchange:

- Assembly Bill 703 (1999) requires reporting and open ocean exchange for ships that discharge ballast water into California waters after operating outside of the EEZ. Starting January 1, 2000, the Ballast Water Management for Control of Nonindigenous Species Act of 1999 established a statewide, multi-agency program to prevent or reduce the introduction and spread of exotic aquatic species into the state waters under the direction of the State Lands Commission in consultation with other state and federal agencies. This program includes an inspection and monitoring program, biological surveys to determine the extent of exotic species introduction in state waters (conducted by the CDFG), and evaluation of alternatives for mid-ocean exchange, conducted by the State Water Resources Control Board. The law applies to all United States or foreign vessels that enter California waters after operating outside the U.S. EEZ. Moreover, vessels must either conduct a mid-ocean exchange of ballast water or retain all ballast water on board the vessel. The law also requires that the State Lands Commission develop and implement a ballast water inspection and monitoring program, and evaluate the effectiveness of the act. Under section 71205(a) of the act, ship agents and operators are responsible for submitting a ballast water reporting form for each voyage prior to the vessel leaving the first port of call in California;

- Assembly Bill 1334 (2001) bans the sale, possession and transport of the genus of *Caulerpa* throughout California;

- Senate Bill 1573 (2002) establishes the Interagency Aquatic Invasive Species Council to establish a plan to address the threats posed by aquatic invasive species in California by January 1, 2004; and

- Assembly Bill 1059 (2002) allows state officials to close Agua Hedionda Lagoon, or any other state waterway, to all recreational boating activities to control the spread of *Caulerpa taxifolia*.

The State Lands Commission (2000) reports that during the first three months of the new state program (noted above) compliance for reporting requirements was less than 60 percent statewide, and several large ship agents had compliance rates less than 50 percent. However, the State Lands Commission notes that compliance has improved since the early development and implementation of the state program.

Vessel Traffic

Vessel traffic is regulated through a framework of overlapping international treaties and standards, national laws/regulations, and local, port, or area-specific rules. In general, the purpose of such regulations is to: prevent vessel collisions, groundings, and other accidents; allow for safe operations at port facilities; provide for the security of the United States; protect the environment; promote safety; and allow enforcement of other applicable laws. The laws, regulations, and rules that apply to a vessel are mainly a function of the vessel's location, flag of registry, and intended port of call, but also depend on the vessel type, size, purpose, and nature of work.

The following are summaries of key regulations that apply to general traffic through the study area:

Automatic Identification System (AIS) - 33 CFR 164.46

According to federal regulations the following vessels must have a properly installed, operational, type approved AIS as of the date specified:

- Self-propelled vessels of 65 feet (20 m) or more in length, other than passenger and fishing vessels, in commercial service and on an international voyage, not later than December 31, 2004.

- Tankers, regardless of tonnage, not later than the first safety survey for safety equipment on or after July 1, 2003.

- Vessels, other than passenger vessels or tankers, of 50,000 GRT or more, not later than July 1, 2004.

- Vessels, other than passenger vessels or tankers, of 300 GRT or more but less than 50,000 GT, not later than the first safety survey for safety equipment on or after July 1, 2004, but no later than December 31, 2004.

- Towing vessels of 26 feet (8 m) or more in length and more than 600 horsepower, in commercial service.

Offshore Traffic Separation Schemes - 33 CFR Part 167

U.S. Coast Guard regulations address traffic separation schemes as follows (in summary):

- Establish offshore traffic separation schemes (TSS) and precautionary areas;

- Require that mariners in these areas follow Rule 10 of the International Regulations for Preventing Collisions at Sea when operating in or near a TSS. Rule 10 dictates that mariners crossing a lane do so at right angles to the lane and that mariners joining a lane do so at small angles to the direction of traffic flow;

- Warn mariners to stay out of the separation zone between lanes (except fishing vessels, which may operate in a separation zone); and

- Recommend use of a lane by a vessel, although actions for crossing or joining and the restrictions on operating in the separation zone are all mandatory.

As a large percentage of the vessels transiting through the Santa Barbara Channel TSS lanes are foreign-flagged and only engaged in transfer of goods, there are limits as to the ability to regulate them under the "innocent passage" component of the United Nations Convention on the Law of the Sea (UNCLOS). Allowance is given to restrict how the ships can be used in U.S. waters, but no regulation can be passed that applies to the design, construction, manning or equipment of the ships. There are provisions in the UNCLOS that allow for regulation of foreign-flagged ships if needed for:

- The safety of navigation and the regulation of maritime traffic;

- The protection of navigational aids and facilities and other facilities or installations;

- The protection of cables and pipelines;

- The conservation of the living resources of the sea;

- The prevention of infringement of the fisheries laws and regulations of the coastal state;

- The preservation of the environment of the coastal state and the prevention, reduction and control of pollution thereof;
- Marine scientific research and hydrographic surveys; and
- The prevention of infringement of the customs, fiscal, immigration or sanitary laws and regulations of the coastal state.

Vessel Sewage Discharge

International Law

Although the U.S. has not ratified MARPOL's Annex IV, which addresses the disposal of sewage, these regulations do impact the majority of the large vessels which transit through the Study Area: approximately 87% are foreign flagged (Santa Barbara County Air Pollution Control District 2007). Revisions to Annex IV, effective as of August 2005, state that the discharge of sewage into the sea is prohibited, except when a ship has in operation an approved sewage treatment system or is discharging comminuted and disinfected sewage using an approved system at a distance of more than three nautical miles from the nearest land; or is discharging sewage which is not comminuted or disinfected at a distance of more than 12 nautical miles from the nearest land. This regulation applies to newly constructed ships engaged in international voyages, of 400 GRT and above, or which are certified to carry more than 15 persons. Existing ships will be required to comply with the provisions of the revised Annex IV five years after the date of its entry into force (meaning August 2010).

Federal Law

Section 312 of the CWA (33 U.S.C. 1322), requires federal performance standards for MSDs in order to prevent the discharge of untreated or inadequately treated sewage into or upon the navigable waters from new vessels and existing vessels, except vessels not equipped with installed toilet facilities. The applicable MSD standards and regulations are codified in the CFR. 40 CFR part 140 describes the U.S. Environmental Protection Agency's standards for discharges from MSDs, and 33 CFR part 159 describes the U.S. Coast Guard's MSD requirements. In addition, 46 CFR 184.704 on shipping also states that, "A vessel with installed toilet facilities must have a marine sanitation device that complies with 33 CFR Part 159."

The purpose of the U.S. Coast Guard MSD regulations is to govern the design and construction of MSDs, and procedures for certifying that MSDs meet EPA MSD regulations and standards to eliminate the discharge of untreated sewage from vessels into the waters of the U.S., including the territorial sea (33 CFR 159.1). For purposes of the U.S. Coast Guard MSD regulations, territorial sea means, "the belt of the seas measured from the line of ordinary low water along that portion of the coast which is in direct contact with the open sea and the line marking the seaward limit of inland waters, and extending seaward a distance of 3 miles," (33 CFR 159.3).

Collectively, CWA Sec. 312 and its implementing regulations: require all vessels with toilet facilities to have operable MSDs; allow discharges from operable Type I and II MSDs within 3 miles offshore; and allow discharges from Type III MSDs outside 3 miles offshore, or at land based pump-out facilities. Vessels 65 feet and under may use a Type I, II or III MSD, while vessels over 65 feet in length must have a Type II or Type III MSD (33 CFR 159.7). 33 CFR 159.3 provides the following definitions for the three types of MSDs:

- Type I marine sanitation device means a device that, under the test conditions described in Sec. 159.123 and 159.125, produces an effluent having a fecal coliform bacteria count not greater than 1,000 per 100 milliliters and no visible floating solids;

- Type II marine sanitation device means a device that, under the test conditions described in Sec. 159.126 and 159.126a, produces an effluent having a fecal coliform bacteria count not greater than 200 per 100 milliliters and suspended solids not greater than 150 milligrams per liter; and

- Type III marine sanitation device means a device that is designed to prevent the overboard discharge of treated or untreated sewage or any waste derived from sewage.

Existing CINMS regulations prohibit discharging or depositing any material or other matter, with an exception for biodegradable effluents incidental to vessel use of the Sanctuary generated by marine sanitation devices (among other exceptions). The intent of this regulation is to prohibit the discharge of untreated sewage into the Sanctuary). Proposed revisions to this regulation are discussed in sections 2 and 4 of this FEIS.

In general, the U.S. Coast Guard has primary responsibility for ensuring that vessels comply with section 312 of the CWA. For example, the Coast Guard conducts quarterly inspections of all cruise ships operating in U.S. waters. Those inspections are usually scheduled in advance and performed in port. The Coast Guard may also use aircraft to detect illegal pollution discharges from vessels.

State Law

The California Clean Coast Act (California Public Resources Code sec. 72420 – 72422) is intended to prohibit releases of sewage and sewage sludge into marine waters of the state (including state waters within a national marine sanctuary) from both large passenger vessels (cruise ships) and oceangoing ships with sufficient holding tank capacity. Sec. 72410 indicates that, "'Sewage' has the meaning set forth in section 775.5 of the Harbors and Navigation Code, including material that has been collected or treated through a marine sanitation device as that term is used in section 312 of the CWA (33 U.S.C. 1322) or material that is a byproduct of sewage treatment." Sec. 72410 also defines "large passenger vessel," "oceangoing ship," and "sufficient holding tank capacity," among other terms. The application of the sewage and graywater discharge regulations only to those oceangoing ships with sufficient holding tank capacity is due to California's interpretation of the "innocent passage" clause in UNCLOS Article 21, and given that approximately 87% of the oceangoing ships transiting the California coastline are foreign-flagged (Santa Barbara County Air Pollution Control District 2007).

Pursuant to section 1322(f) of the CWA, the State of California submitted an application to the U.S. EPA to prohibit sewage and sewage sludge discharges from large passenger vessels and oceangoing ships within state waters. While California is awaiting approval of this application the California Clean Coast Act prohibitions on the release of sewage and sewage sludge discharges from large passenger vessels and ocean ships with sufficient holding tank capacity are not in effect.

The California Clean Coast Act also states that the State Water Resources Control Board shall request the appropriate federal agencies to prohibit the release of sewage sludge (with exceptions for certain emergencies and vessels under innocent passage), by large passenger vessels and oceangoing ships in all of the waters (*i.e.*, state and federal) that are in the Channel Islands, Cordell Bank, Gulf of the Farallones, and Monterey Bay national marine sanctuaries (Sec. 72440 (b)).

California Harbors and Navigation Code sec. 775-786 is intended to ensure that vessels with installed toilets (except foreign and domestic vessels engaged in interstate or foreign commerce) comply with

federal standards for marine sanitation devices. This code requires that use of marine sanitation devices be in conformance with the CWA (33 U.S.C. 1321 *et seq*.). The code also indicates that California vessel owners should not be subject to any local or state regulation as to the type of marine sanitation devices installed on their vessels.

The California Ocean Plan's Water Quality Control Plan (SWRCB 2005) states that waste (defined as including a discharger's total discharge, of whatever origin, *i.e.*, gross, not net, discharge) shall not be discharged to areas designated as being of special biological significance. Areas of special biological significance (ASBS) are designated by the State Water Board as

> …ocean areas requiring protection of species or biological communities to the extent that alteration of natural water quality is undesirable. All Areas of Special Biological Significance are also classified as a subset of state water quality protection areas [SWQPA]. (SWRCB 2005)

The California Ocean Plan also states that discharges shall be located a sufficient distance from such designated areas to assure maintenance of natural water quality conditions in these areas (SWRCB 2005). This plan sets water quality objectives for ocean waters, along with limits or levels for bacterial, physical, and chemical characteristics. The entire plan applies to point source discharges to the ocean, and the plan's water quality objectives and stipulations regarding SWQPA's (among other components) apply to nonpoint source waste discharges. State waters around the Sanctuary include two SWQPA's: the San Miguel, Santa Rosa, and Santa Cruz Islands SWQPA, and the Santa Barbara and Anacapa Islands SWQPA.

Voluntary Agreements

As previously noted, certain, but not all, cruise line companies have agreed to voluntary pollution reduction measures, including measures pertaining to sewage. Because these measures are voluntary they are not required, not enforced, and compliance with them (or lack thereof) is not monitored or verified.

CLIA members agree not to discharge blackwater within four miles of shore (for ships that travel regularly on itineraries beyond the territorial waters of coastal states; CLIA 2006a). When outside four miles of shore, they agree not to discharge blackwater unless the vessel is underway at six knots or more. They also agree to pass all blackwater through a certified MSD prior to discharge. Those vessels using an Advanced Wastewater Purification System are not obliged to follow this voluntary agreement. Since CLIA does not include all cruise ship operators these agreements are not universally followed. More information about the CLIA is available at www.cruising.org.

The City of Santa Barbara Waterfront Department requires cruise ships visiting Santa Barbara to sign a Captain's Declaration stating that no discharge of treated sewage or any conventional sewage, along with other specified pollutants, shall occur within twelve nautical miles from the City of Santa Barbara. The declaration also states that should any such discharge occur the captain will notify the Santa Barbara Harbor Patrol within 24 hours, and provide specified details about the discharge. (Santa Barbara Waterfront Department 2007, personal communication with B. Slagle.)

Vessel Graywater Discharge

International Law

There are no international regulations regarding graywater, nor are there any known to be under consideration at this time.

Federal Law

The CWA and its implementing regulations, and other broadly applicable federal regulations regarding vessel discharges, neither explicitly prohibit nor explicitly allow graywater discharges from vessels. The CWA provides that the Secretary of Defense shall require the use of a marine pollution control device on board a vessel of the Armed Forces in any case in which it is determined that the use of such a device is reasonable and practicable (33 U.S.C. 1322(n)). In summary, the CWA indicates that a marine pollution control device is any equipment or management practice on board a vessel of the Armed Forces that is designed to receive, retain, treat, control, or discharge a discharge incidental to the normal operation of a vessel (including graywater).

Although, the National Marine Sanctuaries Act implementing regulations (15 CFR part 922) explicitly address graywater discharges (as defined by section 312 of the CWA), within a subset of national marine sanctuaries, the original CINMS regulations did not. In this FEIS, the NMSP is proposing that the CINMS prohibition on discharge and deposit include an explicit exception for graywater discharges, in the context of water and other biodegradable effluents, that would only apply to vessels less than 300 GRT, and oceangoing ships without sufficient holding tank capacity to hold graywater while within the Sanctuary. The NMSP is also proposing to add the following definition to the National Marine Sanctuary Program regulations at 15 CFR 922.71: "Graywater means galley, bath, or shower water." This addition is merely a technical change since the definition is identical to the graywater definition in the currently pending proposed rule, which refers to graywater as defined in the CWA. The new definition of graywater incorporates the definition found in the CWA in order to facilitate understanding of the rule by Sanctuary users.

State Law

The California Clean Coast Act (California Public Resources Code sec. 72420 – 72422) prohibits graywater discharges into marine waters of the state from: large passenger vessels and oceangoing ships with sufficient holding tank capacity. Sec. 72410 indicates that "'Graywater' means drainage from dishwasher, shower, laundry, bath, and washbasin drains, but does not include drainage from toilets, urinals, hospitals, or cargo spaces." This section also defines "large passenger vessel," "oceangoing ship," and "sufficient holding tank capacity," among other terms. This act also requires both regulated classes of vessel to notify the State Water Resources Control Board of any releases of graywater into the marine waters of the state (including state waters within a national marine sanctuary), and to provide to the California State Lands Commission a list of specified vessel data and information for all vessels operating in waters of the state in 2006.

Voluntary Agreements

As noted previously, certain, but not all, cruise line companies have agreed to voluntary pollution reduction measures, including measures pertaining to graywater. Because these measures are voluntary they are not required, not enforced, and compliance with them (or lack thereof) is not monitored or verified.

CLIA members agree not to discharge graywater within four miles of shore (for ships that travel regularly on itineraries beyond the territorial waters of coastal states; CLIA 2006a). When outside four miles of shore, they agree not to discharge graywater unless the vessel is underway at six knots or more. Exceptions for graywater discharge are provided, allowing for "emergency or geographical limitation," which is not well defined (CLIA 2006a). Since CLIA does not include all cruise ship operators these agreements are not universally followed.

The City of Santa Barbara Waterfront Department requires cruise ships visiting Santa Barbara to sign a Captain's Declaration stating that no discharge of graywater (TSG) effluent or any conventional graywater, along with other specified pollutants, shall occur within twelve nautical miles from the City of Santa Barbara. The declaration also states that should any such discharge occur the captain will notify the Santa Barbara Harbor Patrol within 24 hours, and provide specified details about the discharge. (Santa Barbara Waterfront Department 2007, personal communication with B. Slagle).

3.5.4 Contaminant Sources

Water and sediment quality has been identified as one of the most important management issues affecting the general health and integrity of coastal marine ecosystems (California Coastal Conservancy 2001; Ferren *et al.* 1997; Page 1999). During intense winter storms, millions of tons of material from coastal watersheds and urban areas are transported into the SCB, and can reach the northern Channel Islands. The "Plumes and Blooms" research program and partnership with the CINMS has shown that river discharge plumes distribute pollution throughout a large portion of the marine area; the Santa Clara and Ventura Rivers produce a plume that can enter the Santa Barbara Channel and extend as far as 37 miles westward. Plumes have been shown to cover areas from 38 to 580 square miles, although a 1,158 square mile plume was identified after an extreme storm event.

During winter storms, the four large rivers that discharge into the northern SCB (Santa Clara, Ventura, Santa Maria, and Santa Ynez Rivers) are capable of producing large discharge plumes that can affect the Santa Barbara Channel (Hickey 2000b). The discharge from a single major storm event can be much larger than the average annual discharge. During the upwelling conditions that follow major floods, the plume from the Santa Clara and Ventura Rivers can surround Anacapa Island (Hickey 2000b). Upwelling conditions also form a plume from the discharges of the Santa Maria and Santa Ynez Rivers that extends southward past Point Conception and enters that channel from the west (Hickey 2000b). The upwelling that follows major storms is very effective at moving fine sediments away from coastal river mouths and out toward the Channel Islands (Hickey 2000b). This material is derived from mainland river watersheds, which include agricultural lands and urban areas. Pollutants can be rapidly transferred from their point of origin to coastal marshes or the ocean (Hickey 2000b), at times reaching the CINMS.

This section focuses on water and sediment quality impacts associated with point and non-point source pollutants on the marine ecosystems of the Study Area, as well as pollution associated with natural oil seeps in the Santa Barbara Channel. Non-point source pollution, or polluted runoff, most often comes from a more ambiguous source, or a broader area, usually in the form of runoff from a variety of land uses such as agriculture, urban, and industrial operations. Point source pollution can be traced to a clearly discernible source, usually municipal or industrial facilities such as wastewater treatment plants, and oil refineries or power plants. The location of major contaminant inputs to the SCB is depicted below in Figure 3.5-5.

Two state Areas of Special Biological Significance (ASBSs)/State Water Quality Protection Areas (SWQPAs) are located within the boundaries of the CINMS. ASBS/SWQPA 17 is located in state waters surrounding San Miguel, Santa Rosa, and Santa Cruz Islands seaward to a distance of 1 nmi, and ASBS/SWQPA 22 is located in state waters surrounding Santa Barbara and Anacapa Island seaward to a distance of 1 nmi.

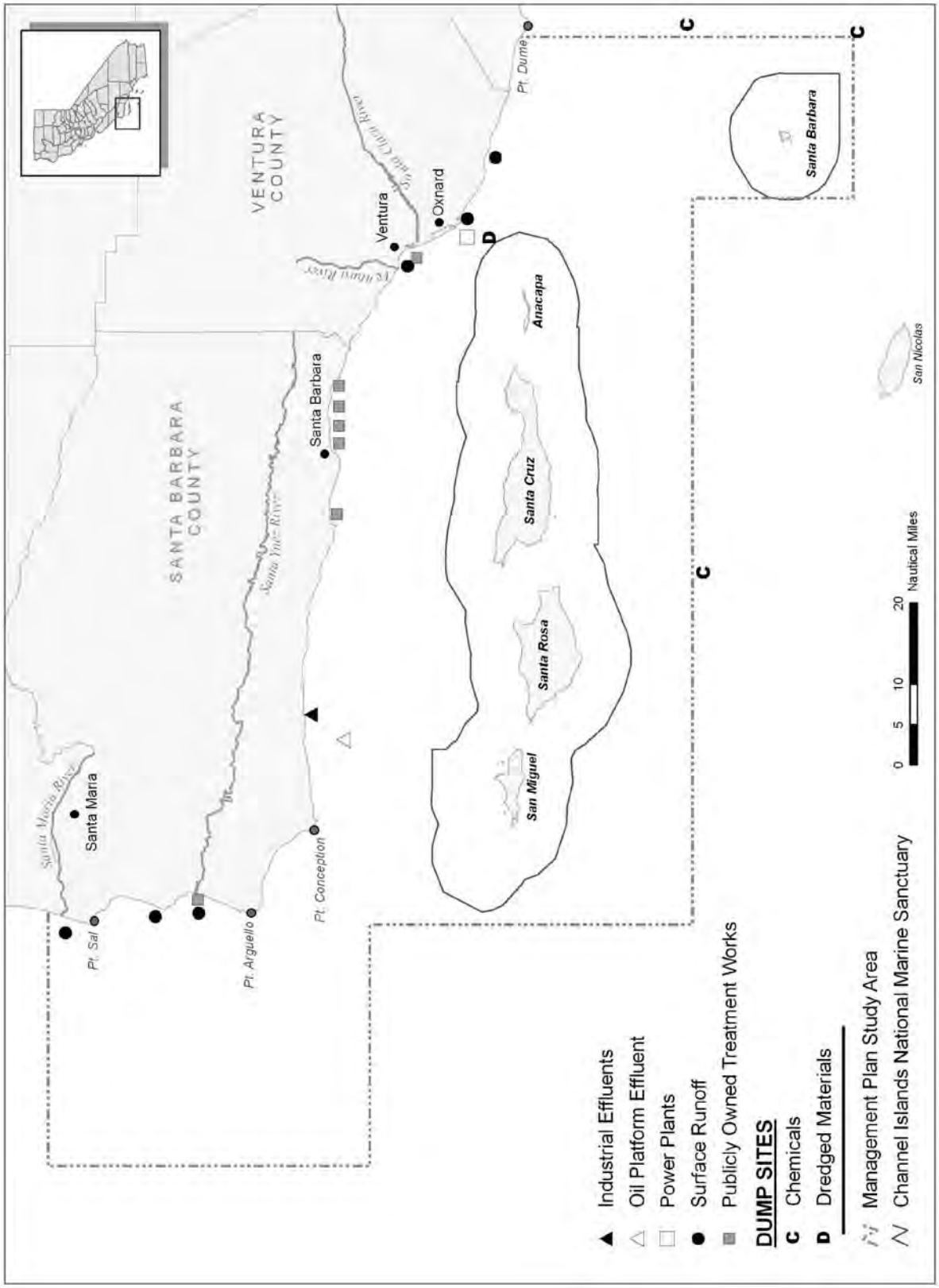

Figure 3.5-5 CINMS Study Area Point Source Contaminant Inputs

3.5.4.1 Natural Oil Seeps

Natural oil seeps are found offshore in the SCB from Point Conception to Huntington Beach. The largest concentration of seeps is in the Santa Barbara Channel area, adjacent to the CINMS (Wilkinson 1972). In the area of Coal Oil Point, seepage has been estimated to occur at a rate of 50 to 70 barrels of oil per day (Wilkinson 1972). These seeps produce continuous oil slicks on the surface of the water and even visible tar mounds on the bottom within kelp beds (Spies and Davis 1979). The natural seeps appear to cause no visible damage to nearby giant kelp beds, since extensive canopies regularly develop in these beds when oceanographic conditions are good for growth. In general, the oil released from seeps is moved by currents and wind to the shoreline, either on the mainland coast or the Channel Islands.

3.5.4.2 Point Source Discharges

Point sources of pollution to marine ecosystems include oil platforms, ocean dumping, municipal wastewater outfalls including storm water outfalls, and industrial outfalls including power plant cooling flows. Each of these point sources is discussed in more detail below.

Anderson *et al.* (1993) identified 178 discrete sources of contaminant and nutrient input to the SCB from Point Conception to the Mexican border. A total of 26 discrete input sources are located in the area from Point Conception to Point Dume (Table 3.5-11).

Table 3.5-11. Summary of Inputs from Discrete Sources of Contaminants to the Study Area

Location	Class	Flow (million m^3/yr)	Number of Sources
Santa Barbara and Ventura Counties	Municipal waste (sewage)	52.9	8
	Power plant effluent	2,543	2
	Other industrial effluent	1.7	6
	Surface runoff	59.4	10

Source: Anderson *et al.* 1993.

Oil Platforms

Details on the number and type of oil and gas facilities within the Study Area are described in FEIS section 3.5.1. The following text discusses potential point sources stemming from these facilities. Terminology pertaining to oil platforms is explained in the glossary in FEIS section 10.

Effluent discharge is only permitted from oil and gas platforms located in federal waters; no discharges are permitted from facilities located in state waters. In federal waters, a total of 10 of the 16 platforms discharge produced water, while all platforms discharge deck drainage, treated sewage, well completion and workover fluids, and other effluents (MMS 2001).

A project conducted by the Southern California Coastal Water Research Project (SCCWRP) found that although offshore oil production in the region increased by a factor of six from 1935 to 1991, oil platforms operating in federal waters in 1990 were a relatively minor source of contaminants to the coastal ocean. The mass emissions of drilling wastes were 9 percent of the mass emissions of suspended solids discharged from the four largest municipal wastewater treatment facilities in southern California. The mass emissions of contaminants from produced water from oil platforms were less than one percent of the combined emissions for the same constituents from the four largest municipal facilities. The total

mass emissions from the offshore platforms were low because most drilling and sanitary wastes generated at offshore platforms in 1990 were sent to onshore facilities for processing.

There are, however, threats of offshore oil well blowouts, pipeline leaks, oil tanker spills, and leaks associated with decommissioning of platforms. The effects of large oil spills on giant kelp beds (*Macrocystis pyrifera*) have been documented twice along the western Pacific coast; once during 1957 when a small tanker, the *Tampico*, spilled a load of mineral oil in a cove along Baja California; the other during the 1969 offshore well blow-out and spill in the Santa Barbara Channel (Foster and Schiel 1985). North *et al*. (1964) studied the *Tampico* spill and noted that there was massive mortality of invertebrates, including sea urchins, in the cove. Damage to giant kelp was not obvious and within five months of the spill, vegetation in the cove was increasing and juvenile giant kelp began to develop. Presumably, the diesel oil had killed sea urchins that had been maintaining the bottom. Once the urchins were killed, giant kelp and other species of algae began to develop (North *et al*. 1964). Giant kelp plants that recruited following the loss of sea urchins produced canopy in the cove, approximately 18 months after the spill.

Crude oil from the 1969 Santa Barbara spill polluted a large portion of the mainland coast, and many of the Channel Islands (Foster *et al*. 1971). Assessment of the effects of the spill was complicated by record storms and rainfall that occurred at the same time as the spill. There was little damage to the giant kelp beds, even though considerable quantities of crude oil fouled the surface canopies (Foster *et al*. 1971). The partially weathered crude oil appeared to stay on the surface of the water and did not stick to the fronds of the giant kelp. In addition to the direct effects from oil spills on giant kelp, there are documented negative effects on kelp from substances used in oil spill cleanup operations. The surfactant-based oil dispersant Corexit 9554 has been shown to have acutely toxic effects on the early life stages of giant kelp (Singer *et al*. 1995).

Surfgrass and eelgrass beds can be particularly sensitive to oil pollution, but the impacts of oil on these marine plants are not well understood (Foster *et al.* 1988). Unlike slime-producing algae that can slough off oil, eelgrass has non-mucilaginous leaves to which oil quickly adheres (CDFG 2002).

Oil spills and chemical dispersants used in oil spill cleanup can have significant effects on wildlife as well. Animals exposed to oil may be affected by both internal and external impacts. Exposure of fish embryos to low levels of oil has been shown to cause physical deformities, damage to genetic material, and mortality (Carls 1999). Seabirds that have ingested oil have been found to suffer from petroleum toxicosis and damage to the liver, kidney, pancreas, lungs, and intestine, and external exposure to oil fouls waterproofing capabilities of birds (Newman *et al.* 2003). Long-term effects of oil exposure on seabirds have also been documented after rehabilitation of oiled seabirds, including behavioral abnormalities in California Brown Pelicans, and higher mortality rates in American Coots due to problems associated with inflammation, iron utilization, or metabolism (Newman *et al.* 2003). Sea otters, a species especially vulnerable to oil spills, may suffer impacts arising from oil ingestion (during grooming), inhalation and damage to pelage and ingestion of oil-contaminated prey (Bodkin *et al.* 2002; Ridoux *et al.* 2004). In a study of long-term effects of the 1989 *Exxon Valdez* oil spill in Prince Williams Sound, Bodkin *et al.* (2002) found that the area of the Sound most heavily impacted by the oil spill showed no evidence of sea otter population growth as of 2000, likely due to elevated mortality in and emigration away from this heavily impacted area. Bodkin *et al.* (2002) also found evidence that residual oil has persisted and been transferred through the nearshore food web for up to a decade after the oil spill. In general, oil impacts on marine mammals include: getting stuck in the oil, becoming stained with oil, decreasing foraging performance, modification of prey availability, hydrocarbon absorption by prey species (lethal in high concentrations), and bioaccumulation of oil-specific trace elements (Ridoux *et al.* 2004). Affects of oil on several invertebrate species found within the Channel Islands has been observed, though little is known about these impacts and impacts on numerous other invertebrate species have not been studied.

California mussels (*Mytilus californianus*) are adversely affected by oil spills (Chan 1973; Foster *et al.* 1971). Little is know about oil impacts on black abalone, but North *et al.* (1964) reported black abalone mortality following a spill in Baja California. Owl limpets (*Lottia gigantea*) are common in high and middle intertidal zones of exposed rocky shores from Washington south to Baja California. The limpets and their feeding territories are vulnerable to oiling, but oil impacts are unclear. For example, limpets of this species were not obviously affected by the 1971 San Francisco oil spill (Chan 1973). Oil impacts on invertebrates such as limpets and abalone may be exacerbated due to their low recruitment and slow growth rates, so recovery from any major disturbance likely would be lengthy.

Due to variability among petroleum products, environmental conditions, and affected taxa, once oil spills occur there is no simple solution to address them. While dispersants are known to have negative effects on marine organisms, in a recent study of comparative toxicity of oil, dispersant, and oil plus dispersant, Fuller *et al.* (2004) concluded that dispersant (Corexit 9500) toxicity in field applications would be negligible compared to oil toxicity. Fuller *et al.* (2004) also concluded that while all three scenarios (oil, dispersant, and oil plus dispersant) demonstrated that declining exposures were less toxic than continuous exposures, but only significantly so in the oil plus dispersant scenario. Following the 2001 *Jessica* oil spill in the Galapagos Islands, Gelin *et al.* (2003) studied the effects of the spill on intertidal macroinvertebrate communities. While Gelin *et al.* (2003) did not have pre-spill baseline data for comparison, based on their analyses they concluded that there were no impacts on high-intertidal invertebrate communities at oiled sites 4 to 11 months after the spill. Based on these findings, Gelin *et al.* (2004) concluded that extensive shoreline cleanup operations were not warranted in response to this spill, and that the trampling, mechanical abrasion, and use of dispersants associated with such a cleanup would likely have generated more impact than the oil spill itself. There is no scientific agreement as to whether oil spill response and cleanup enhances or hinders ecosystem recovery following oil spill events. Oil spill prevention is the most effective means to avoid potential direct and indirect oil spills impacts.

Cold-water discharges would be a potential point source discharge from proposed liquefied natural gas storage and re-gasification units (see FEIS section 3.5.1.3).

Marine Debris and Ocean Dumping

Another SCCWRP study found that manmade debris occurred on approximately 14 percent of the mainland shelf of the SCB (Moore and Allen 2000). Manmade debris was most common in the central (urbanized) region on the outer shelf, and in areas near municipal sanitary sewer system outlets. The most common type of manmade debris found in the central region and the outer shelf was fishing gear, while glass bottles and plastic were most common near the sewer outlets. Natural debris, primarily vegetation from onshore sources and marine vegetation from nearshore reefs, was more common close to shore in the inner shelf zone (Moore and Allen 2000). Because the manmade debris (fishing gear and plastic) was found farther from shore than natural debris, the primary source of manmade debris in the marine environment was believed to be fishing activity rather than storm water runoff (Moore and Allen 2000).

There are no active ocean disposal or dumping sites within the Study Area and discharge and disposal of most matter within the CINMS is specifically prohibited under existing regulations. Dredge spoils, low-level radioactive waste, and military munitions and/or explosives have historically been disposed of in the SCB. The majority of dredging and filling operations currently occur within port facilities (Resources Agency of California 1997). There are inactive chemical dump sites located in the vicinity of Santa Lucia Bank and south of Santa Cruz Island. These sites were formerly used or designated for United States chemical munitions dumping. An additional area southeast of Santa Barbara Island is charted as a

disused explosives dumping area. In addition, 3,100 containers of low-level radioactive waste were dumped off Port Hueneme at a depth of 4,570 meters (U.S. EPA 1983).

The following active ocean disposal sites are also close to the boundaries of the Study Area:

- Name: Los Angeles/Long Beach, California (LA-2)
  Location: 33 degrees 37.10' North Latitude by 118 degrees 17.40' West Longitude (North American Datum from 1983), with a radius of 3,000 feet (910 meters).
  Size: 0.77 square nmi.
  Depth: 380 to 1060 feet (110 to 320 meters).
  Primary Use: Ocean dredged material disposal.
  Period of Use: Continuing use, subject to submission of a revised Consistency Determination to the California Coastal Commission after 5 years of site management and monitoring.
  Restrictions: Disposal shall be limited to dredged sediments that comply with the U.S. Environmental Protection Agency's Ocean Dumping Regulations.

- According to nautical charts, an active dredged material disposal site is located at the base of Hueneme canyon (NOAA 1992).

Ocean dumping in or near the Study Area may lead to transport of material to the CINMS. Impacts of ocean dumping are not well understood and are highly dependent on such factors as ocean currents and distribution of contaminants, chemical interactions of dumped materials in water and associated degradation time, and short-term and long-term biological impacts on living marine resources such as invertebrates, marine mammals, and fishes. Marine debris can also injure or kill marine mammals, seabirds, and sea turtles through ingestion and entanglement.

Municipal Wastewater Outfalls

Most water used for domestic and industrial purposes enters municipal treatment plants and eventually empties into the ocean. Section 402(p) of the Federal Water Pollution Control Act (FWPCA or CWA) also requires that storm water outfalls (*e.g.*, surface runoff) be considered point sources. Surface runoff is composed of storm and dry weather flows that differ in contaminant concentrations, time, and duration. Surface runoff is approximately 68% the volume of municipal wastewater discharge (Polhemus 2006).

Pursuant to the FWPCA, municipalities are required to provide secondary treatment (physical and biological treatment) of discharges to treat disease-causing bacteria, excess nutrients, and hazardous substances such as heavy metals and polychlorinated biphenyls (PCBs). However, section 301(h) of the FWCPA provides for a waiver of the full secondary sewage treatment requirement if certain conditions are met demonstrating equivalent treatment.

Ocean discharge of treated sewage is common throughout the region. Sewage outfalls, with varying levels of sewage treatment, discharge into the Santa Barbara Channel (see Table 3.5-12 below). Treatment facilities for point source pollution are categorized as primary (physical treatment), advanced primary (physical and some chemical treatment), secondary (physical and biological treatment), and tertiary (additional control measures beyond secondary treatment to remedy specific pollution problems). There are no municipal wastewater outfalls within the CINMS. The wastewater treatment plant at Oxnard is the largest point source discharging into the Santa Barbara Channel.

Table 3.5-12. Municipal Wastewater Treatment Plants Discharging into the Study Area

Municipal Wastewater Treatment Plants	Receiving Water	Level of Treatment	Baseline Flow	Design Flow	Flow Limit
City of Lompoc	Santa Ynez River*	Secondary	3.5	5	5
Goleta	Santa Barbara Channel	Primary/ Secondary	6.044	10.5	7.64
Santa Barbara (El Estero)	Santa Barbara Channel	Secondary	8.5	11	11
Montecito	Santa Barbara Channel	Secondary	0.85	1.5	1.5
Summerland	Santa Barbara Channel	Tertiary	0.145	0.15	0.3
Carpinteria	Santa Barbara Channel	Secondary	1.4	2	2.5
Oxnard	Santa Barbara Channel	Secondary	18.2	31.7	None specified

Note: All units are in mgd (million gallons per day).
*Lompoc discharges to a tributary of the Santa Ynez River, which drains into the ocean north of Point Conception.

Industrial Outfalls

Anderson *et al*. (1993) show that power plants discharge 10 times more volume than municipal wastewater treatment plants in the region. Other industrial inputs to the coastal waters in the region are small compared to other point sources. There are no industrial wastewater outfalls within the CINMS, but there are a few in the Study Area.

Untreated industrial effluent can include toxic organic chemicals (detergents, oil, industrial solvents) and toxic metals (mercury, lead), or elevated temperatures, which can affect marine organisms at several levels including metabolic impairment or damage at the cellular level, physiological 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). Discharges from industrial outfalls can also increase sediment input to the marine ecosystem that can destroy benthic biota or interfere with the filter feeding and respiratory functions of marine organisms.

In addition to environmental impacts from power plant outfalls, intake systems at power plants that use seawater for once-through cooling can have negative impacts on marine organisms. Intake structures can cause mortality of large organisms that are entrapped on cooling system intake screens, an occurrence known as impingement. Mortality of smaller organisms can occur if they pass through the intake screens into the plant, known as entrainment (CEC 2005).

The following power plants currently discharge into the Study Area:

- Reliant Energy operates the Mandalay Generating Station, a plant with a design capacity of 560 megawatts, in Oxnard, California, under a National Pollutant Discharge Elimination System (NPDES) Self-Monitoring Program. The Mandalay Generating Station may discharge up to 255.3 million gallons per day of wastes consisting of once-through cooling water from two steam electric generating units (four condenser halves), metal cleaning wastes, fireside and air preheater

washes, and low volume wastes into the Pacific Ocean. The combined effluent is discharged through a concrete and rock-revetted structure (Discharge Serial No. 001) located at a point directly across the Mandalay Beach, west of the plant.

Reliant Energy monitors chemical constituents in their effluent. Reliant Energy also monitors receiving water column parameters twice a year at five shoreline stations and at twelve inshore stations. Seafloor sediments are monitored annually at five stations for general sediment quality and trace elements. Benthic invertebrate communities are monitored annually at five stations. Biological communities (monitored by trawl) are performed twice a year at four stations. Bioaccumulation in fish and invertebrates is not monitored.

- Reliant Energy also operates the Ormond Beach Generating Station (Ormond), a 1,500 megawatt plant, in Oxnard, California, under a NPDES Self-Monitoring Program. Ormond may discharge up to 688.2 million gallons per day of wastes consisting of once-through cooling water from two steam electric generating units, metal cleaning wastes, and low volume wastes into the Pacific Ocean. The combined effluent is discharged through an ocean outfall (Discharge Serial No. 001) located approximately 1,790 feet offshore of Ormond Beach at a depth of 20 feet.

  Reliant Energy monitors chemical constituents and toxicity in its effluent. Receiving water column parameters are monitored twice a year at nine stations. Seafloor sediments are monitored annually at six stations for general sediment quality and trace elements. Benthic invertebrate communities are monitored annually at the same six stations. Potential entrainment of fish and invertebrates on the cooling water intake screens are evaluated every two months. Trace elements are analyzed annually in bivalves sampled near the discharge conduit.

In Gaviota, Chevron U.S.A. Inc. (Chevron) Gaviota Oil/Gas operates a seawater desalination plant, a wastewater treatment plant for produced water from crude oil and natural gas production, and a wastewater disposal system operating under a NPDES Self-Monitoring Program. The outfall separates the oil and gas from the produced water, which is treated by means of induced-gas flotation and settling and is discharged to the Pacific Ocean through a 5,200-foot outfall and diffuser system. Chevron discharges combined desalination plant wastewater and treated oil and gas plant wastewater to the ocean through the Santa Barbara Channel. The U.S. EPA classifies this as a minor discharge.

3.5.4.3 Non-point Source Discharges

Non-point source pollution does not originate from individual, identifiable sources like industrial facilities, municipal sewage treatment plants, or offshore oil platforms. The U.S. EPA (2000a) identifies non-point source pollution as the nation's largest source of water quality problems, and runoff from urban areas as the largest source of water quality impairments.

Non-point source pollution results 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 (U.S. EPA 2000a). It is widespread because it can occur whenever activities disturb the land or water. Agriculture, forestry, grazing, construction, physical changes to stream channels, septic systems, urban runoff, and habitat degradation are all potential sources of non-point source pollution (U.S. EPA 2000).

The most common non-point source pollutants are sediments and nutrients such as fertilizers. Other non-point source pollutants may include:

- Herbicides and insecticides from urban and agricultural runoff;

- Oil, grease, toxic chemicals, and heavy metals from urban runoff;
- Bacteria, viruses, and nutrients from livestock, pet wastes, and faulty septic systems;
- Accidental spills of fuels and other hazardous materials; and
- Air pollutants that settle out of the atmosphere onto the ocean.

The mainland watersheds that drain into the ocean in the Study Area all include urban and agricultural lands that yield non-point source pollutants. The two largest watersheds, those of the Santa Maria and Santa Clara Rivers, both encompass large agricultural areas. The Santa Clara River watershed has a large component of urban land as well. From Rincon to Goleta, 41 creeks enter the Santa Barbara Channel from the south side of the Santa Ynez Mountains. Many of these creeks flow through urban and agricultural areas along the coast and transfer non-point source pollutants directly into estuaries and coastal waters. Runoff from winter storms accelerates the delivery of non-point source pollutants to the marine environment. The Santa Clara and Ventura rivers are the largest contributors to non-point source pollution into the Santa Barbara Channel.

There are also a number of watersheds located on the four northern Channel Islands. A recent study by SCCWRP, under contract by the State Water Resources Control Board, surveyed potential discharges in State Water Quality Protection Areas around the four northern islands (SCCWRP 2003). The results of this study are summarized below.

San Miguel Island is unprotected from and directly exposed to all storms and ocean turbulence that comes its way. There are no roads and a few structures that are well beyond 100 meters of the coast. These structures—as well as a leach field located near the ranger station—are not likely to contribute to discharges into the CINMS. Although it is unlikely that the leach field could drain to the CINMS, this area was listed as a potential source of discharge. Twenty-nine outlets to the ocean (gullies or streams) were identified for this island.

Santa Rosa Island is the second largest of the Channel Islands and has approximately 46 miles of shoreline. It is a diverse island of grass-covered rolling hills, steep canyons, creeks, rocky intertidal areas and sandy beaches. Forty-one outlets (gullies or streams) were recorded for Santa Rosa Island. There are few potential anthropogenic sources upstream of these outlets, with the exception of road drainage and previous grazing impacts. The Central Coast Regional Water Quality Control Board has issued a cleanup and abatement order to the NPS requiring it to develop a road management plan, since the roads on this island do contribute to erosion and downstream deposition of sediment. No point sources were seen during the survey of this island. Santa Rosa Island has few structures and hosts mainly campers and hikers.

Santa Cruz Island is the largest of the Channel Islands and has approximately 77 miles of shoreline. The coastline of this island is diverse, consisting of sheer cliffs and bluffs, beaches, and grasslands. The Nature Conservancy owns and manages the western 75 percent of the island; the eastern 25 percent is owned and managed by the NPS. Sheep ranching was historically practiced on this island and areas where vegetation was depleted are still visible. Sixty-five outlets (gullies or streams) were recorded for this island. There are few potential anthropogenic sources upstream of these outlets, with the exception of previous grazing impacts. No point sources were observed during the survey for this island. Santa Cruz Island has few structures and hosts mainly campers and hikers. The inland Central Valley, somewhat distant from the islands' coast, has a few structures that house visiting scientists doing research on island flora and fauna.

Santa Barbara Island is surrounded by volcanic cliff walls and has only two facilities, a ranger station that is staffed by the NPS, and a landing facility, both of which are listed as non-point sources. Near the ranger station there is a leach field and three portable toilets. Although doubtful that the leach field contributes any significant discharge, it is listed as a potential non-point source discharge. The few visitors to the island are limited to some camping and hiking, but the primary activities take place offshore and include diving and fishing. There are no roads and only a few small foot trails.

Anacapa is the smallest of the Channel Islands and consists of three small islets. Ocean waves have eroded the perimeter of the island, creating steep sea cliffs and exposing the volcanic origins of air pockets, lava tubes, and sea caves. There are few structures on the island, which include a museum, visitor center, and a lighthouse. Activities on the island include camping and hiking. Only the boat landing facility for Anacapa Island was classified as a non-point source discharge.

Potential impacts to marine ecosystems from non-point source pollution include: lowered photosynthesis and oxygen levels, introduction of disease, disturbance to spawning and nursery areas, loss of food sources (trophic disruption) and habitats, chemical disturbances, destruction of benthic biota, resuspension of fine sediments, and interference with filter feeding and respiratory functions of marine organisms.

3.5.4.4 Regulatory Setting

Point Source Discharges

Numerous statutes address a variety of issues related to point source discharges to marine ecosystems. Federal statutes include the Federal Water Pollution Control Act (FWPCA or CWA) (33 U.S.C. 1251 *et seq.*); the Rivers and Harbors Act of 1899 (33 U.S.C. 401 *et seq.*); titles I and II of the Marine Protection, Research, and Sanctuaries Act (commonly known as the Ocean Dumping Act) (33 U.S.C. 1401 *et seq.*); the Oil Pollution Act of 1990 (OPA) (33 U.S.C. 2701 *et seq.* and scattered); the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (42 U.S.C. 9601 *et seq.*); and the Coastal Zone Management Act (16 U.S.C. 1451 *et seq.*).

In addition, state statutes that bear relevance to point source discharges include the Porter Cologne Water Quality Control Act (California Water Code sections 13000–14958, *et seq.*); the California Coastal Act (California Public Resources Code sections 30000–30900); and the Lempert-Keene-Seastrand Oil Spill Prevention and Response Act of 1990 (California Government Code sections 8574.1–8670.5 and California Public Resources Code sections 8750–8751).

Over the past 20 years, emphasis on point source pollution control has produced significant improvements in water quality. Dischargers are required to obtain permits specifying requirements to be met, including conditions for discharge, effluent standards, discharge improvement schedules, and self-monitoring activities.

Effluents

Federal. In 1972, the Congress enacted the FWPCA, which established the National Pollutant Discharge Elimination System (NPDES), a permitting process to regulate point source discharges of pollutants to navigable waters of the United States. The U.S. EPA issues NPDES permits in federal waters and has delegated authority to the State Water Resources Control Board (SWRCB) to issue these permits in state waters. Permits are issued for discharges from sources such as offshore oil and gas platforms, municipal wastewater treatment plants, industrial outfalls, and storm water.

All NPDES permits for discharges affecting any land or water use or natural resource of the California coastal zone also require a determination by the California Coastal Commission that the activity is consistent with California's Coastal Management Program.

Section 402(p) of the FWPCA requires urban storm water outfall systems to be considered point sources and established a permit system that became effective in October 1992. The classification of urban stormwater as a point source can be somewhat confusing. Typical examples of point sources are discharges from discrete wastewater treatment facilities. Stormwater drainage usually emanates from many widely-dispersed sources and is often mistakenly thought of as a non-point source discharge. The 1987 CWA amendments require municipalities and industries to apply for an NPDES permit to discharge storm water into storm drains. The State Water Resources Control Board has adopted three general NPDES permits addressing storm water discharges associated with municipal, industrial and construction activities.

State. The State Water Resources Control Board (State Water Board) has the primary responsibility to preserve and enhance California's coastal and ocean water quality through the development of water quality control plans and the issuance of waste discharge requirements (WDRs), which are required by the California Water Code. NPDES permits serve as WDRs for point source discharges to surface waters. Examples of point source discharges include offshore oil and gas platforms, municipal wastewater treatment plants, industrial outfalls, and storm water outfalls.

WDRs for land and surface water discharges are issued and enforced by one of the nine Regional Water Quality Control Boards (Regional Water Boards), although the State Water Board can issue WDRs that cover similar activities that span more than one region. The mission of the Regional Water Boards is to develop and enforce water quality objectives and implementation plans by regulating a variety of activities that occur in watersheds that discharge or threaten to discharge into state waters within their bounds. Two Regional Boards overlap the Study Area: the Central Coast Regional Water Quality Control Board, which extends from Santa Clara County to northern Ventura County, including San Miguel Island, Santa Rosa Island, and Santa Cruz Island; and the Los Angeles Regional Water Quality Control Board, which extends from Ventura County to Los Angeles County, and includes Anacapa Island and Santa Barbara Island.

WDRs, including NPDES permits issued by the Regional Water Boards, are subject to review by the State Water Board, but do not need the State Water Board's approval before becoming effective. However, all NPDES permits are subject to approval by U.S. EPA before they take effect.

The State Water Board has adopted, and U.S. EPA has approved, statewide water quality control plans that include the California Ocean Plan (Ocean Plan) and the California Thermal Plan (Thermal Plan). The plans identify existing and potential beneficial uses and establish water quality objectives and implementation procedures. The Ocean Plan applies to ocean waters, defined as the "territorial marine waters of the State as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons." (California State Water Resources Control Board 2005) If a discharge outside the territorial waters of the state may affect the quality of the waters of the state, the discharge may be regulated to ensure no violation of the Ocean Plan will occur in ocean waters.

Enforcement of WDRs or NPDES permits by the Regional Water Boards is done when monitoring or other sources indicate a violation of permit conditions. Dischargers are required to establish self-monitoring programs for their discharges and submit compliance reports to the Regional Water Boards. In addition, water quality monitoring may be performed by a variety of entities, including the regional boards. For example, Central Coast Regional Water Board runs the Central Coast Ambient Monitoring

Program which monitors and assesses water quality within watersheds, groundwater basins, coastal confluences, and nearshore areas. Cease and Desist Orders and Cleanup and Abatement Orders can be issued along with stiff financial penalties for noncompliance based on water quality monitoring activities.

Fill and Dredged Materials

Authorization to dispose of dredged materials in the ocean, within enclosed coastal waters, or on land is provided through a variety of federal and state permit processes. Under authority of the Rivers and Harbors Act, section 404 of the FWPCA, and the Ocean Dumping Act, the USACE develops, controls, maintains, and conserves the nation's navigable waters and wetlands. The USACE regulates development of any project involving fill, construction, or modification of waters of the United States.

For example, pursuant to section 103 of the Ocean Dumping Act, the USACE is authorized to permit disposal of dredged material into the ocean if the USACE determines that "the dumping will not unreasonably degrade or endanger human health, welfare, or amenities, or the marine environment, ecological systems, or economic potentialities." However, the USACE is prohibited from issuing such a permit if the U.S. EPA finds that the proposal cannot meet its criteria established for disposal site selection pursuant to section 102 of the Ocean Dumping Act. Federal permits for dredged material disposal cannot be issued, pursuant to section 401 of the FWPCA, unless the State Water Resources Control Board issues or waives a certification that the proposed activity will not violate state water quality standards. In addition, the State Water Resources Control Board regulates discharges of dredged materials into state waters by issuing WDRs through its Porter-Cologne Water Quality Control Act authority. Finally, the California Coastal Commission has authority over disposal of dredged material pursuant to the federal consistency provisions of the CZMA.

Marine Debris and Ocean Dumping

Reducing marine debris resulting from garbage disposal is one of the objectives of the 1973/1978 International Convention for the Prevention of Pollution from Ships (MARPOL Treaty) and the federal Marine Plastic Pollution Research and Control Act of 1987, which specifically targets plastic debris. Plastic debris is especially troublesome as marine species can become entangled in plastic products and frequently mistake the products for food.

The USCG is the federal agency charged with enforcing MARPOL-related regulations for trash, garbage, and plastics disposal at sea and requirements for sewage-holding tanks aboard vessels, although enforcing these regulations is logistically difficult. The RWQCBs have regulatory authority in marinas, but limited resources are available for enforcement.

Non-point Source Discharges

In the past few years, public awareness and government management efforts have turned to several complex and pressing issues regarding non-point source discharges, including the impacts of petrochemical and metals runoff from urban areas; nutrients, pesticides, and sediment runoff from agricultural and forestry operations; heavy metals leaching from inactive mines; erosion from modification of stream channels; and runoff from marinas.

Federal. There have been three developments in non-point source pollution response at the federal level:

- Section 208 of the FWPCA focuses on issue identification, initial planning measures, and voluntary programs that should be considered with regard to non-point source pollution;

- Section 319 was added to the FWPCA, providing a more aggressive approach to controlling or minimizing non-point source pollution by committing federal funds for state management plans, demonstration projects, and implementation plans; and

- Section 6217 of the *Coastal Zone Act Reauthorization Amendments of 1990* (CZARA) requires states with approved coastal management programs to develop Coastal Nonpoint Pollution Control Programs. The U.S. EPA and NOAA jointly administer this program at the federal level, while the California Coastal Commission, State Water Resources Control Board, and six coastal RWQCBs are required to develop and administer it at the state level.

State. The programs and policies of the State Water Resources Control Board for preventing non-point source pollution are included in its nonpoint source management plan prepared pursuant to section 319 of the FWPCA and coastal nonpoint pollution control program pursuant to section 6217 of CZARA. Section 6217 requires the state to implement 56 enforceable management measures that have been identified by the U.S. EPA to address polluted runoff from all sources including: agriculture, forestry, urban areas, hydromodification, and abandoned mines. Although the emphasis of the program is currently voluntary, the relevant California statutes also provide enforcement mechanisms for these provisions.

As part of the nonpoint source management plan, the state has initiated a new program for Critical Coastal Areas as well. All watershed areas adjacent to ASBSs/SWQPAs are included in Critical Coastal Areas.

Water Quality Monitoring

Water quality monitoring is conducted in various locations along the California coast pursuant to permit requirements, voluntary programs, or efforts by government, the private sector, academic research institutions, industries, and various non-profit groups. Although multiple sources of water quality monitoring information exist, many portions of the coastline do not have regular sources and no comprehensive inventory currently exists to determine the full extent of these monitoring activities for the SCB. However, federal, state, and local agencies are striving to implement a regional monitoring program for the SCB.

The Southern California Bight Pilot Project, a regional monitoring program extending from Point Conception to the Mexican border, was implemented in 1994 to determine the ecological health of the region's waters. The pilot project involved cooperation by the four major ocean wastewater dischargers in the region, three coastal RWQCBs, the U.S. EPA, the CINMS, and an independent research facility, the SCCWRP. Since the pilot survey project in 1994, two additional surveys were conducted in 1998 and in 2003. Initial results from these surveys have been sufficiently promising such that regional monitoring has been proposed for other coastal regions.

The California Department of Health Services and many, but not all, of California's coastal counties conduct water quality testing and monitoring of coastal waters. Subsequent decisions to close beaches are based on non-compliance with Department regulations. County health departments are required to report beach closures to the State Water Resources Control Board where the data are entered into a centralized data collection system, and an annual beach closure report is prepared for the legislature.

The NMSP is active in water quality monitoring, water quality research and education, and emergency response planning for the CINMS. In addition to the Southern California Bight monitoring project, the NMSP is currently supporting researchers from the University of California, Santa Barbara to implement the Plumes and Blooms Project, which is an ongoing study of storm water runoff impacts on the Santa

Barbara Channel. The NMSP is also implementing other various education and outreach water quality programs as discussed further in section 3.5.11.2 below.

3.5.5 Introduction of Non-native and Genetically Modified Species

A native species is essentially a species that lives in its place of origin. In this context, origin is considered in terms of thousands of years. Native species evolve by adapting to their local habitats; all forms of life are a result of a continuing process of interaction between their inherited traits and characteristics of their environment. A native organism lives within its natural and historical range and zone of dispersal. Introduced species fall into two categories. A non-native (or exotic) species is a species (including any of biological matter capable of propagation) that is not native to the ecosystem(s) in which it occurs (*i.e.*, a species transported beyond its natural range to places it could not get to either by itself or through natural dispersal, such as by wind, tides, currents). A genetically modified species is 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.

Exotic species can be introduced to the marine ecosystem via the hulls of commercial and recreational vessels and live-well tanks. As described earlier, ballast water can also convey adults, larvae, spores, and seeds of an introduced species but not necessarily the natural predators associated with the adult form. Benthic organisms may also inadvertently be taken in with sediments in water uptake. There are a number of other ways that exotic species are introduced to coastal marine ecosystems:

- Attachment to an intended introduced species, such as oysters for commercial harvesting;
- Intended introduction for commercial and sport fishery, mariculture, or biocontrol efforts**;**
- Release of unwanted organisms by aquarists or bait fishermen; and
- Natural spread from original point of introduction.

It is not just ballast water, but also vessel hulls, rudders, propellers, seawater piping systems, intake screens, ballast pumps, and sea chests that are capable of inadvertently transporting species. Introduced species can also be 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.

Although a definitive list of exotic species does not exist for the Santa Barbara Channel, a few of the most common exotic species off the California coast are *Sargassum* (brown alga), *Undaria pinnatifida* (Asian kelp), *Caulerpa taxifolia*, American lobster, European flat oyster, and Japanese clam. The CINP Kelp Forest Monitoring Project has not found dominant communities of exotic species. A 2005 report on non-native species monitoring in west coast national marine sanctuaries and National Estuarine Research Reserves provided information on non-native sessile invertebrates in the Channel Islands region (deRivera *et al.* 2005). DeRivera *et al.* (2005) deployed settling plates at six Partnership for Interdisciplinary Studies of Coastal Oceans (PISCO) buoys and two piers (Oxnard Vintage Marina and Ventura West Harbor) in the Channel Islands region in 2004. After 182 days they found 16 non-native invertebrate species (six bryozoan, nine urochordate, and one crustacean species). These organisms were introduced through vectors including shipping (hull-fouling), fisheries (accidental introduction via oysters), and ballast water. The first west coast introductions of these species occurred in locations such as San Diego Bay, La Jolla, Long Beach Harbor, Drakes Estero, Monterey Bay, San Francisco Bay and Tomales Bay in California, and Scammon's Lagoon in the Sea of Cortez, Mexico. DeRivera *et al.* 2005.

Once exotic species have become established in international ports, recreational vessels traveling within California waters can transport the species. The species may also expand their range simply by drifting as planktonic larvae in the California Current and affect regional marine environments. For example, Morro Bay, with no international shipping, has over 25 exotic species.

Striped bass (*Morone saxatilis*) were intentionally introduced to California in 1879. The California Department of Fish and Game manages a striped bass sport fishery under the Striped Bass Management Conservation Plan. This conservation plan is designed to maintain the striped bass population and sport fishery while allowing for recovery of several threatened and endangered fish species (*e.g.*, Sacramento River winter-run chinook salmon and delta smelt) given potential striped bass predation on them. (Leet *et al*. 2001)

Once sources of exotic species are established at locations such as ports and harbors, intraregional travel can expedite and permit spread of the species. Approximately 10 percent of established introduced species become invasive (National Invasive Species Council 2001). The term "invasive" applies to non-native species that cause or are likely to cause harm to the economy, the environment or to human health (Executive Order 13112, Appendix 1). The estimated economic costs of species invasions are $137 billion per year (National Invasive Species Council 2001). With over 45,000 commercial cargo ships transporting 10 billion tons of ballast water around the globe every year, the rate of introductions is predicted to significantly increase (Carlton 2001).

Studies of exotic species in the San Francisco Bay and Delta estuary have described no less than 234 exotic species, with over 100 different species of aquatic invertebrates alone. Several of these species, including the European green crab (*Carcinus maenus*) may reach the Santa Barbara region in the near future, having recently been observed in Morro Bay (Grosholz 2003; Wasson *et al*. 2001). Moreover, studies of San Diego Bay have identified over 100 exotic species (U.S. Navy 2000). There has been a rapid increase of nonnative tunicates, for example, in southern California harbors and marinas and Asian kelp was recently discovered at Catalina Island (Silva *et al*. 2002).

Van Zyll De Jong *et al.* (2004) provide an example of long-term impacts from release of introduced species in Newfoundland and Labrador, Canada. While this study focused on species that are the subject of freshwater fisheries, the types of impacts described have broader relevance. Introductions began in these areas in the 1880s and have led to interspecific and intraspecific competition, predation, possible introduction of disease and parasites, genetic effects, and changes in community structure (Van Zyll De Jong *et al.* 2004).

Exotic species can have several types of impacts on native coastal marine species:

- 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).

See also the information in FEIS section 3.5.3.4, under the sub-header "Ballast Water Exchange and Other Management."

Exotic species have negatively impacted over 45 percent of listed threatened or endangered species in the United States; the establishment of exotic species is second to habitat loss as the major threat to native species diversity (Government Accounting Office 2002; Kimball 2001; Wilcove *et al*. 1998).

Genetically modified species may cause environmental impacts similar to those of non-native species, in addition to impacts unique to transgenic species when released into the environment (Kapuscinski and Hallerman 1990). In general, genetic modification of marine and aquatic organisms is used for the following purposes: to improve the quality and quantity of fish reared in aquaculture; as a detection tool for the prevention, control and management of diseases in aquaculture operations; to provide genetic markers used in population monitoring; for biofarming (*e.g.*, freshwater Tilapia used to produce insulin); ornamentation; and for industrial applications (Aerni 2004). Kapuscinski and Hallerman (1990) suggested that genetically modified fish may exhibit three main categories of differences from their nongenetically modified counterparts: 1) physiological, 2) tolerance of physical factors (*e.g.*, temperature, pH, or salinity), and 3) behavioral (*e.g.*, seasonal migration, habitat selection, prey selection, territoriality, and reproduction); along with additional changes sought by geneticists such as increased resistance to certain diseases or to certain drugs. On a global scale approximately 35 fish species are the subject of transgenic research (Reichhardt 2000) and as of 2004, 14 fish species had been genetically modified for enhanced growth, though none had been approved for commercialization (Aerni 2004). In order for transgenic species to have a genetic impact on their nontransgenic counterparts their modified genes must spread through the wild population, which requires that the genetically modified individuals have a fitness advantage over their nongenetically modified counterparts in at least one of the following six components: juvenile viability, adult viability, age at sexual maturity, female fecundity, male fertility, or male mating advantage (Howard *et al.* 2004). According to Howard *et al.* (2004), when genetically modified individuals breed with nongenetically modified individuals within a population and the genetically modified individuals have a fitness advantage in one of the above components, the relevant modified gene will replace the natural gene in the population. However, when the genetically modified individuals have a fitness disadvantage in another component this has the potential to lead the affected population to extinction, a phenomenon the authors refer to as the "Trojan gene effect." For example, this phenomenon may occur when genetically modified males have a mating advantage relative to nongenetically modified males, but their resulting offspring, which also carry the modified gene, have reduced viability relative to offspring without the modified gene (Kapuscinski and Hallerman 1990; Howard *et al*. 2004).

Based on the numerous potential impacts of transgenic fish on natural ecosystems, and difficulty in assessing these potential impacts *a priori*, Kapuscinski and Hallerman (1990) recommended that special precautions be made to prevent use and release of transgenic fishes in proximity to environments with severely depleted or endangered species, environments with ongoing restoration projects, and for designated natural preserves. While proponents of genetically modified fish species suggest sterilization as a means by which to prevent many of the impacts associated with release of transgenic species, a zero risk of these impacts cannot be guaranteed since the current practice of developing all-female sterile offspring is less then 100% successful due to varying success in its application among different species and by personnel implementing these methods (Aerni 2004).

3.5.5.1 Regulatory Setting

Despite the threats posed by the release of exotic species to coastal economies and ecosystems, there is currently no federal monitoring program, ecosystem-based characterization, or biological inventory of exotic species associated with the CINMS.

Federal and state environmental policies have been adopted to address some of the threats posed by the release of exotic coastal marine species. The National Invasive Species Act of 1996 was passed to:

- Prevent unintentional introduction and dispersal of nonindigenous species into waters of the United States through ballast water management and other requirements;
- Coordinate federally conducted, funded, or authorized research, prevention, control, information dissemination and other activities regarding the zebra mussel and other aquatic nuisance species;
- Develop and carry out environmentally sound control methods to prevent, monitor, and control unintentional introductions of nonindigenous species from pathways other than ballast water exchange;
- Understand and minimize economic and ecological impacts; and
- Establish a program of research and technology development and assistance to states in the management and removal of zebra mussels.

Executive Order 13112 (1999) also supports prevention of release of invasive exotic species. In October 2001, the National Invasive Species Council (established by Executive Order 13112) published *Meeting the Invasive Species Challenge*, which is a comprehensive management plan and report that outlines the necessary policy actions to prevent and control the spread of invasive exotic species.

The following California Department of Fish and Game regulations also address issues associated with the introduction of exotic species:

- Fish and Game Code sections 2116-2126 address illegal transportation of certain species;
- Fish and Game Code sections 6300–6306 address infected, diseased or parasitized fish, amphibian or aquatic plants;
- Fish and Game Code sections 6440–6460 address control of aquatic nuisance species; and
- Fish and Game Code sections 8596–8598 address control of the aquaria pet trade.

The CDFG's OSPR is responsible for conducting research to determine the location and extent of exotic species populations in coastal and estuarine waters of the state.

On October 10, 2003, California Governor Gray Davis signed California Senate Bill 245, which bans ocean farming in state waters off the coast of California of exotic and genetically modified fish. The law also bans ocean farming of salmonids unless it is conducted on behalf of the CDFG or it is for the purpose of recovery, restoration, or enhancement of California's native salmon and steelhead trout populations.

See also the information in FEIS section 3.5.3.4, under the sub-header "Ballast Water Exchange and Other Management."

3.5.6 Fishing

3.5.6.1 Commercial Fishing

Commercial fishing (by nets, traps, lines, diving, and other methods) occurs at various locations off the coast of Southern California, including the Channel Islands. The nearshore waters along the coast from Ventura to Santa Barbara and the waters around the Channel Islands contain giant kelp beds that support numerous species. The majority of fish are caught within these areas. Fishery seasons are established and regulated by the California Fish and Game Commission and regulated by the California Department of Fish and Game, except for groundfish, wetfish (anchovies, sardines and mackerels) and highly migratory species (tunas, dolphin fish, wahoo, marlin and sailfish). Groundfish, wetfish, and highly migratory species are federally managed by the Pacific Fishery Management Council and NOAA's National Marine Fisheries Service.

Live fish trapping (*e.g.*, rockfish, sheephead, and other nearshore species) occurs primarily in the shallower waters near the coastlines of the Channel Islands. Hook and line fisheries catch a variety of species on hand lines, longlines, rod and reel, and trolled gear. Lobsters are trapped in coastal waters since they are typically most abundant in rocky areas with kelp in depths of 100 feet (30 meters) or less. The waters off the majority of the Channel Islands provide extensive rocky kelp habitat since they generally have an offshore shelf that extends gradually into deeper waters. Gill nets are not allowed within 3 nmi of the mainland coast, or within 1 nmi of the offshore islands in the CINMS. Commercial drift gill netting for pelagic shark and swordfish occurs in the open waters throughout portions of the CINMS. This fishery, however, is only a small portion of the total industry in southern California.

Key target species for commercial fishing in the CINMS and SCB include:

- Squid;
- Sea urchin;
- Spiny lobster;
- Prawn;
- 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;
- Wetfish;
- Sea cucumber;
- Sculpin and bass; and
- Tuna.

The commercial harvest of kelp near the coastline was an established industry in Southern California. A description of historical kelp harvesting is provided under FEIS section 3.5.6.3.

In 2003, 473 fishing operations received over $36.7 million in revenue from fish and invertebrates caught in the CINMS. Twenty three (23) percent of the operations (102 operations) accounted for almost 80% of the total revenue (Leeworthy *et al*. 2005).

In 2002, commercial fisheries generated approximately $71.7 million in income and supported 1,956 full-time and part-time jobs in the seven-county area from Monterey County south through San Diego County (these estimates include multiplier impacts in each county that are defined in the glossary and in discussed in Leeworthy *et al*. 2005). Supplies of commercial fishing products from the CINMS are a small portion of U.S. and world supply and therefore any reductions in CINMS catch would not be expected to have impacts on consumer prices and consumer's surplus. In addition, most commercial fisheries are either open access fisheries or over capitalized and therefore no producer's surplus or economic rents exist. Economic rents are most likely negative meaning reductions in fishing capacity would most likely yield positive benefits (Leeworthy and Wiley, 2003).

Brief descriptions of some of the more prominent fisheries in the Channel Islands follow below. More detailed descriptions are provided in *Marine Protected Areas in NOAA's Channel Islands National Marine Sanctuary – Final Environmental Document* (2002), available on line at http://www.dfg.ca.gov/mrd/ci_ceqa/index.html, as well as in Leeworthy *et al*. (2005).

Prawn Prawn fisheries in the Sanctuary area have historically included trawl and trap fishing for spot prawns (*Pandalus platyceros*) and trawl fishing for ridgeback prawns (*Sicyonia ingentis*). Traditionally, a number of trawl boats fished year round for both ridgeback and spot prawns, targeting ridgeback prawns during the closed season for spot prawns, and targeting spot prawns during the closed season for ridgeback prawns. Live individuals accounted for 95 percent of spot prawn landings (from trap and trawl vessels combined), and for the period from 1997 to 1999 accounted for 28 to 68 percent of ridgeback prawn landings (Leet *et al*. 2001).

The California Fish and Game Commission adopted a prohibition on spot prawn trawl gear in 2003. The ridgeback prawn trawler fleet operates from Fort Bragg south to the United States-Mexico border. Most vessels operate out of Monterey, Morro Bay, Santa Barbara, and Ventura, although a number of Washington-based vessels participate in prawn fisheries during the fall and winter. The ridgeback trawl fishery began in 1965. Although the fishery for spot prawns started in the early 1930s when prawns were caught incidentally in Monterey area octopus traps, a trawl fishery did not begin in the Channel Islands area until 1974 (Leet *et al*. 2001). In 1985 a spot prawn trap fishery developed in the Southern California Bight and was concentrated around the Channel Islands.

Landings and revenue from the prawn fisheries have varied tremendously since their inception (Leet *et al*. 2001). Landings decreased dramatically from 1985 to 1991 (population declines were confirmed by California Department of Fish and Game surveys during that time), but increased to over 1.4 million pounds in 1999 (Leet *et al*. 2001, 2001; Thompson *et al*. 1993). Following the peak in the 1999 prawn catch, the fishery showed a declining trend thru 2003, when the spot prawn trawling prohibition was implemented.

Spiny Lobster (Panuliris interruptus) Since the late 1800s, there has been a commercial lobster fishery in southern California. Commercial lobster fishing occurs in shallow, rocky areas from Point Conception to the Mexican border and off the islands and banks of the Sanctuary area. Most of the fishery is in water less than 98 feet deep, although the fishery has expanded to include deeper habitats. A sport fishery (hand capture) is popular among scuba divers in the Channel Islands area.

The peaks and valleys that have characterized this fishery are not unexpected in a fishery strongly influenced by the weather, El Niño and La Niña events, and the export market. Seasonal landings in the 200,000 to 400,000 pound range rose following World War II and peaked in the 1949-1950 season, with a record 1.05 million pounds landed. A general decline followed for the next 25 years, reaching a low of 152,000 pounds in the 1974-1975 season. Landings remained between 400,000 and 500,000 pounds for

nine consecutive seasons in the 1980s. Landings ranged from 600,000 to 957,000 pounds through much of the 1990s and subsequently decreased. About 90 percent of the legal lobsters taken in the commercial fishery weigh between 1.25 and 2.0 pounds, which produces the size of tail desired for the restaurant trade. Most of the harvest in recent years has been exported to Asian countries and France. However, depressed economies overseas have resulted in an effort to re-establish domestic markets. (Leet *et al.* 2001)

The commercial fishery for California spiny lobster is among the highest in commercial value. The average annual revenue between 1996 and 2003 from spiny lobster caught in the CINMS exceeds $1 million (Leeworthy *et al.* 2005).

Rock Crab The rock crab fishery is made up of three species: yellow rock crab (*Cancer anthonyi*), brown rock crab (*Cancer antnnarius*) and red rock crab (*Cancer productus*). Approximately 95 percent of the landings in this fishery come from southern California, although rock crabs inhabit the nearshore waters of the entire State (Leet *et al.* 2001).

The average annual revenue between 1996 and 2003 from all types of crabs caught in the CINMS was over $400,000 (Leeworthy *et al.* 2005).

Red Sea Urchin (Strongylocentrotus franciscanus) The red sea urchin commercial dive fishery is one of the most important California fisheries. This fishery is relatively new, having developed over the last 30 years, and caters mainly to the Japanese export market (Leet *et al.* 2001). The gonads of both male and female urchin are the object of the fishery and are referred to as "roe "or "uni," in Japanese. Gonad quality depends on size, color, texture, and firmness. Algal food supply and the stage of gonad development affect quality and price. The highest prices are garnered during the Japanese holidays around the new year.

The urchin fishery in southern California began in 1971 as part of a National Marine Fisheries Service program to develop fisheries for underutilized marine species (Leet *et al.* 2001). The fishery also was seen as a way to curb sea urchins' destructive grazing on giant kelp. There have been two periods of rapid fishery expansion in California. The first culminated in 1981 when landings peaked at 25 million pounds in southern California. Contributing to this rapid escalation of the fishery was a group of fishermen and boats involved in the declining commercial abalone dive fishery. Sea urchin landings decreased following the El Niño of 1982-1983, when warm water weakened or killed kelp, the primary food source for sea urchins. Catches did not recover until 1985-1986, helped in part by the strengthening of the Japanese yen relative to the U.S. dollar, favoring California fishermen and exporters. Prices for urchin from the south are typically higher than for urchins from northern California due to the longer market presence and consistently higher gonad quality. The majority of sea urchin landings in southern California come from the northern Channel Islands off of Santa Barbara, where large and accessible stocks once occurred (Leet *et al.* 2001). In the last few years the red urchin fishery has become fully exploited throughout its range in northern and southern California. The purple sea urchin, which occurs over the same geographical range, is also harvested in California, but only on a very limited basis.

The average yearly revenue from the sea urchin fishery between 1996 and 2003 was over $430,000 (Leeworthy *et al.* 2005).

Sea Cucumber Most sea cucumber catch is taken in southern California waters, with commercial divers almost exclusively harvesting the warty sea cucumber (*Parastichopus parvimensis*) while trawlers primarily take the California sea cucumber (*P. californicus*). Divers take sea cucumbers as far south as offshore from San Diego, but most of the commercial catch is from the four northern Channel Islands in depths of 36-120 feet (Leet *et al.* 2001).

The warty and California sea cucumbers support an expanding commercial fishery that began in 1978 and peaked in 1998 at nearly 900,000 pounds (Leet *et al*. 2001). Most of the California and warty sea cucumber product is shipped overseas to Hong Kong, Taiwan, China, and Korea. Chinese markets within the United States also purchase a portion of California 's sea cucumber catch. The majority are boiled, dried, and salted before export, while lesser quantities are marketed as a frozen, pickled, or live product. The processed sea cucumbers can sell wholesale for up to $20 per pound. Studies of the biomedical properties of various sea cucumber chemical extracts, such as saponins, and chondroiton sulfates, are being conducted by western medical researchers investigating the efficacy of these substances for pharmaceutical products (Leet *et al*. 2001).

The average annual revenue from the sea cucumber fishery between 1996 and 2003 was over $220,000 (Leeworthy *et al*. 2005).

Abalone Chinese Americans started the California abalone fishery in the 1850s, targeting green abalone (*Haliotis fulgen*) and black abalone (*H. cracherodii*) in the intertidal zone. Following the closure of shallow waters to commercial harvest in 1900, Japanese Americans began diving to collect abalone. The only commercially harvested species reported for the period 1916 to 1943 was red abalone (*H. refuscens*). In southern California commercial harvest of abalone was prohibited from 1913 to 1943, then reopened to increase wartime food supplies. Following World War II the fishery serially depleted one species of abalone after another, despite stable landings (at that time the fishery was managed as a single-species fishery though it targeted several species). The fishery alternated from targeting red, to pink (*H. corrugata*), to green, to white (*H. sorensensi*), and finally to black abalone. Since the 1960s a combination of factors including an increase in fishing pressure, an increase in the sea otter population, and an increase in gear efficiency led to a southward expansion from the original center of the fishery in Monterey.

The Department of Fish and Game determined that targeted abalone species had suffered stock collapse due to overfishing. In 1992 the black abalone fishery was closed after further significant stock decline associated with a bacterial disease known as "Withering Foot Syndrome" (Karpov *et al*. 2000). In 1997, California Senate Bill 463 closed all of California to commercial abalone harvest. However, between 1988 and 1997, over $2.5 million of abalone was harvested from the CINMS (Leeworthy and Wiley, 2003).

Currently, the California Fish and Game Commission is considering opening a limited red abalone fishery at San Miguel Island. An Abalone Advisory Group, an ad hoc group of constituent representatives appointed by the Fish and Game Commission, were convened to discuss and develop management alternatives related to red abalone.

Market Squid For over 100 years market squid (*Loligo opalescens*) has been harvested off the California coast from Monterey to San Pedro. The squid fishery has expanded into one of the largest fisheries in volume and economic value in California. Expanding global markets, especially in China and the Mediterranean, coupled with a decline in squid product from other parts of the world, has fueled a rapid expansion of the California squid fishery (Hastings and MacWilliams 1999).

The majority of market squid harvest is centered in the northern Channel Islands region, mainly in the Sanctuary area. The peak of the fishery targets the squid mating and egg laying behavior and occurs during fall and winter in Southern California. On a good net set, tons of squid may be harvested. Squid are minimally processed, mainly in San Pedro, California, frozen and shipped around the world, predominately to markets in the Mediterranean and China (Hastings and MacWilliams 1999). Annual squid catches can be greatly influenced by El Niño events. In 1999 (a record year), 169 commercial

fishing operations received over $26.5 million in revenue from market squid caught in the CINMS. The 1996 - 2003 average revenue for the fishery was almost $10.8 million (Leeworthy and Wiley, 2003).

Nearshore Finfishes The Nearshore Fisheries Management portion of the California Marine Life Management Act (MLMA; 1998) defined nearshore finfish species as rockfish, California sheephead, greenlings, cabezon and other species found primarily in rocky reef or kelp habitat in nearshore waters. In the subsequent analyses in this document, the category *rockfish* includes all species of rockfish and cabezon. Since the early 1990's greater emphasis has been placed on identifying individual fish species harvested from this group and avoiding market categories that combine multiple species.

The development of the live/premium fishery in the late 1980's resulted in increasing commercial catches of many species of rockfish occupying the nearshore environment in and around kelp beds. The principal goal of this nontraditional fishery is to deliver fish live to the consumer in as timely a manner as possible. This fishery has increased substantially since 1988, and it continues to supply communities with live and premium quality fish. The impetus of this fishery is the unprecedented and increasing high price paid for live fish.

In 2003, 128 commercial fishing operations received $150,000 in revenue from all rockfish caught in the CINMS (Leeworthy *et al*. 2005). The 1996-1999 average was about $549,000. Large areas of rockfish habitat were closed in the early 2000's along the entire west coast of the United States due to significant declines in a number of rockfish species, including several species that were identified as overfished.

Wetfish (anchovies, sardines and mackerels) are a significant fishery in the CINMS and are caught by many of the same operations that fish for market squid. The 1996-2003 average annual revenue of wetfish was over $470,000 (Leeworthy *et al*. 2005).

Other significant finfish fisheries included California sheephead (the 1996 to 2003 average annual revenue was $155,000) and sculpin and bass (staghorn sculpin, yellowchin sculpin, rock bass, spotted sand bass, kelp bass, barred sand bass, white sea bass—average annual revenue of $93,000) (Leeworthy *et al*. 2005).

Other relatively minor fisheries included swordfish, shark, roundfish (sablefish, louvar, lingcod, kelp greenling and Pacific Whitefish), and yellowtail (Leeworthy *et al*. 2005)

Flatfishes The flatfish fisheries of interest include California halibut, starry flounder, sanddabs and other flatfish. California halibut is caught by trawl and hook-and-line, and is an important fishery in the State. Both recreational and commercial anglers prize flatfish and they are targeted from boats, piers, and the shoreline. Major fluctuations in landings of some species seem to indicate inconsistent recruitment and availability. The average annual flatfish fishery revenue was almost $220,000 between 1996 and 2003 (Leeworthy *et al*. 2005)

Tuna The tuna category includes several highly migratory species, including albacore, bluefin tuna, yellowfin tuna, and bonito. Trolling or jig vessels take the majority of albacore, with a small portion using live bait. In addition, the wetfish fleet may target some tuna species during the summer. In some year, they may catch significant amounts of albacore (Leet *et al*. 2001). Historically, commercial effort for albacore has fluctuated over the past 100 years, based primarily on market and oceanic conditions.

Catch and ex vessel value of tuna have shown large declines. In 2003, commercial fishing operations received a total of approximately $3,000 in revenue from tunas caught in the CINMS (Leeworthy *et al*. 2005). The 1996-1999 average was $205.9 thousand (Leeworthy and Wiley, 2003).

3.5.6.2 Recreational/Sport Fishing and Consumptive Diving

Recreational (sport) fishing involves hook-and-line fishing from piers and docks, jetties, breakwaters, beaches and banks, private or rental boats, and commercial passenger fishing vessels. Recreational fishing also includes activities such as spear and net fishing. Recreational fisheries in the CINMS access both nearshore and offshore areas, targeting both bottom fish and pelagic fish species. Consumptive recreational divers use both private and rental boats and commercial passenger fishing vessels.

The coastlines around the Channel Islands are popular sportfishing areas; although the majority of kelp beds are within 1 nmi of shore, some fishing areas extend far from shore and include lingcod and rockfish grounds west of San Miguel Island; tuna, broadbill swordfish, marlin, and mako shark waters south of Santa Cruz Island; and kelp beds offshore and surrounding portions of all of the islands.

The sportfishing industry in California is composed of commercial passenger fishing vessels, private boats, and shore anglers. The commercial passenger fishing vessels take groups of anglers out on half–day, 3/4–day, full day, and multi-day trips. Types of fish landed on commercial passenger fishing vessels include kelp bass, mackerel, California sheephead, halfmoon, and whitefish. Sport fishing for white seabass is also very popular. The majority of half and 3/4–day trips fish within or near the kelp beds except in the summer when California barracuda (*Sphyraena argentea*) and Pacific bonito (*Sarda chiliensis*) are present. Offshore fishing focuses on more mobile species like yellowtail, tuna, and white seabass. The largest numbers of fish caught for recreational purposes are caught within 3 miles of shore. Barred surfperch, California halibut, jacksmelt, pacific mackerel, kelp bass, rockfish, white croaker are a few of the species that represent the largest numbers caught. Commercial passenger fishing vessel dive trips are often multi-day trips going to one or more of the offshore islands. These trips focus on certain species during various seasons, such as lobster during the open season.

A large number of sport divers (both free divers and SCUBA divers) spearfish for many of the same species caught by hook and line. Species commonly targeted by consumptive divers include many rockfish species and kelp bass, halibut, yellowtail, and white seabass, as well as lobster and scallops. Divers are generally limited to the shallowest waters of the CINMS between the shallow intertidal to depths around 130 feet.

Recreational fishing can have a greater impact on the ecosystem than commonly thought and can be equal to or greater than the impact of commercial fishing (Schroeder and Love 2002). Although some stocks are healthy and support viable recreational fisheries, six species of fish popular with recreational fishermen have been declared overfished by the Pacific Fishery Management Council in the Study Area: cowcod, bocaccio, yelloweye, canary rockfish, dark-blotched rockfish, and Pacific ocean perch. Slow growth and late maturity make these species especially susceptible to decline from fishing pressure (Love and Schroeder 2003).

In 2003, commercial passenger fishing vessel operators accounted for 150,872 person-days of activity in the CINMS. Charter boat diving vessels accounted for 35,977 person-days in 1999 (when most recent analysis was conducted). In addition, private boats accounted for 261.2 thousand person-days of activity within the CINMS in 1999 (214 thousand person-days of fishing and 47.2 thousand person-days of consumptive diving).

In 1999, sports fishing and consumptive diving activity in the CINMS generated $24.7 million in income (including multiplier impacts), which supported 654 full and part-time jobs in the three-county area of Santa Barbara, Ventura, and Los Angeles counties. The commercial passenger fishing vessel industry received direct revenues of approximately $5.2 million with almost $450,000 in profits in 2003. In

addition, the recreators received almost $16 million in consumer's surplus (nonmarket economic user value) (see glossary for definitions of "consumer's surplus" and "nonmarket economic user value") (Leeworthy *et al*. 2005).

3.5.6.3 Kelp Harvesting

Giant kelp was first harvested along the California coast during the early 1900s (Leet *et al*. 2001). Many harvesting companies operated from San Diego to Santa Barbara beginning in 1911. Those companies primarily extracted potash and acetone from kelp for use in manufacturing explosives during World War I. In the early 1920s, having lost the war demand, kelp harvesting virtually stopped. In the late 1920s, giant kelp was again harvested off California.

Giant kelp is now primarily harvested in California for extraction of alginates and other compounds and to supply feed for abalone aquaculture companies. It is also used for the herring-roe-on-kelp fishery in San Francisco Bay (Leet *et al*. 2001). Giant kelp was one of California's most valuable living marine resources and in the mid-1980s supported an industry valued at more than $40 million a year. The annual harvest has varied from a high of 395,000 tons in 1918 to a low of less than 1,000 tons in the late 1920s. Such fluctuations are primarily due to climate and natural growth cycles, as well as market supply and demand. From 1970 to 1979, the annual harvest averaged nearly 157,000 tons, while from 1980 to 1989 the average annual harvest was only 80,400 tons. The harvest was low in the 1980s because the kelp forests were devastated by the 1982–1984 El Niño and accompanying storms, and by the 200-year storm that occurred in January 1988. In most areas, the beds of giant kelp recovered quickly, with the return of cooler, nutrient rich waters. Harvests in California increased to more than 130,000 tons in 1989 and to more than 150,000 tons in 1990.

In the Sanctuary region, ISP Alginates was the only company harvesting giant kelp (Ugoretz 2002), though several small-scale harvesters operate along the mainland coast. During the 1990s, increasing international competition from Japan for the "low end," or less purified end of the sodium alginate market caused ISP Alginates to reduce harvests by about 50 percent (Leet *et al*. 2001). In 2005, ISP Alginates ceased its commercial operations in southern California. This decision has considerable economic implications for southern California; in 1999, kelp harvested from the CINMS and processed in San Diego had a processed value of about $6 million and generated between $6.2 and $7.8 million in income (including multiplier impacts), which supported 45 to 60 jobs in San Diego County (Leeworthy and Wiley 2003).

With proper management, the surface canopy can be harvested several times annually without damage to the kelp bed (Ugoretz and Parker 2002). However, harvesting kelp may have adverse effects on other inhabitants of the kelp forest community because the kelp canopy serves as important habitat for juvenile fishes (Carr 1989) and many species of invertebrates (Coyer 1979, Watanabe 1984). For example, significant reductions in turban snail species were observed in harvested areas compared with unharvested areas in Carmel Bay (Hunt 1977). Others, however, reported that kelp harvesting has little effect on the overall abundance of kelp forest fishes and invertebrates, even though numerous organisms are removed along with the cut fronds (Miller and Geibel 1973; North and Hubbs 1968). Clearly more research is needed to determine the extent to which kelp harvesting affects populations of canopy-dwelling species. It is worth noting that not all effects of harvesting are necessarily detrimental to the forest community. Removing the canopy increases light reaching the bottom and leads to increased recruitment and growth of giant kelp and understory algae (Reed and Foster 1984). Higher production of understory algae in areas of reduced kelp canopies has been linked to increases in food chain support for some reef fishes (Schmitt and Holbrook 1990).

3.5.6.4 Aquaculture

Aquaculture is the practice of culturing, growing and harvesting an aquatic species in a controlled setting. California has approximately 400 registered aquaculturists who raise products within intensive systems (Resources Agency of California 1997). A company named Ecomar formerly used several of the OCS oil and gas structures in the Study Area to raise aquacultural products, such as mussels and other invertebrates. Eight-five percent of the state mussel production and 91 percent of abalone production occurs on land adjacent to the Study Area (Resources Agency of California 1997).

In addition to potentially disturbing the seabed, aquaculture operations have the potential to introduce anoxic conditions, disease pathogens, and exotic species into the environment. For example, Drake's Estero, which is located northwest of San Francisco, has supported productive commercial fisheries for oysters since the 1960s. However, after the introduction of Pacific oysters (*Crassostrea gigas*) from Japan, native oyster species in Drake's Estero exhibited up to 7 percent mild systemic and localized haplosporidian infections (Friedman 1996). Little is known regarding the extent of invasion and damage to marine resources of the Channel Islands from the inadvertent or intentional release of exotic species. Damages from exotic species can range from habitat alteration or destruction, introduction of pathogens threatening human health, and/or predation or competition with native species.

3.5.6.5 Regulatory Setting

A variety of regulations are currently used to manage fisheries in the CINMS. These include total prohibitions on the take of certain species, seasonal closures, and other regulations. Tables 3.5-13a and 3.5-13bb summarize some of the major commercial and recreational, respectively, fishing regulations in place in southern California. These tables are not complete listings of fishing regulations, but are included to show the level of protection currently provided to certain species or species groups. A marine protected area (MPA) network of marine reserves and conservation areas was recently established that also regulates fishing activity in CINMS in addition to the regulations listed in Table 3.5-13a and3.5-13b. For more information and a map of the Channel Islands MPA Network, please refer to the FMP (Vol. I) Resource Protection Action Plan. Fishery seasons are established and regulated by the California Fish and Game Commission and regulated by the CDFG. Fishery seasons are also established and regulated by NMFS, based on the advice and recommendations of the Pacific Fishery Management Council, and in coordination with the State of California, for federal waters off of California.

Table 3.5-13a. General Summary of Commercial Fishing Prohibitions in Southern California*

Species	Gear Type	Regulated Season	Regulations
Abalone			Abalone may not be taken, possessed, or landed for commercial purposes.
All Groundfish (some exceptions)	All Gear Types	March 1 – April 30	Closed Season
All Groundfish (some exceptions)	Non-trawl (Fixed)	Jan 1 – Dec 31	Fishing is prohibited in waters greater than 60 fathoms and less than 150 fathoms south of Point Conception.
All Groundfish (some exceptions)	Trawl	Jan 1 – Feb 28 and Nov 1 – Dec 31	Fishing is prohibited in waters greater than 75 fathoms and less than 150 fathoms along the mainland, and from the shoreline to 150 fathoms around the islands.
All Groundfish (some exceptions)	Trawl	Mar 1 – Oct 31	Fishing is prohibited in waters greater than 100 fathoms and less than 150 fathoms along the mainland, and from the shoreline to 150 fathoms around the islands.
Sheephead	All Gear Types	March 1 – April 30	Closed Season
All Species – Marine Resources Protection Zone	Gill Nets and Trammel Nets		Prohibited in waters less than 70 fathoms or within 1 nautical mile, whichever is less, around all of the Channel Islands**
Rockfish	Gill Nets and Trammel Nets		Use Prohibited in State waters for the take of rockfish.
Rockfish & Lingcod	Gill Nets and Trammel Nets		Prohibited in waters less than 70 fathoms in depth south of Point Sal, except drift and set gill nets shall not be used in waters less than 100 fathoms in depth at Sixty-Mile Bank. Prohibition on the take of rockfish in State waters applies.
Swordfish & Shark	Drift Gill Nets	Feb 1 – April 30	Closed Season
Swordfish & Shark	Drift Gill Nets	May 1 – Aug 14	Use prohibited within 75 nautical miles of the mainland coast between the westerly extension of the CA-OR boundary and the westerly extension of the US-Mexico boundary.
Swordfish & Shark	Drift Gill Nets	May 1 – July 31	Use prohibited within 6 nautical miles westerly, northerly, and easterly of the shoreline of San Miguel Island between a line extending 6 nautical miles west from Point Bennett and a line extending 6 nautical miles east from Cardwell Point and within 6 nautical miles westerly, northerly, and easterly of the shoreline of Santa Rosa Island between a line extending 6 nautical miles west from Sandy Point and a line extending 6 nautical miles east from Skunk Point.

Table3.5-13a, Page 1 of 2

* In addition to the species and gear based restrictions shown here, the Channel Islands MPA network prohibits extractive activities in all marine reserves, and limits extractive activities in marine conservation areas. For more information on the Channel Islands MPA network see the FMP (Vol. I) Resource Protection Action Plan.

** All Channel Islands include San Miguel, Santa Rosa, Santa Cruz, Anacapa, San Nicolas, Santa Barbara, Santa Catalina, and San Clemente.

Note: This is not a complete reproduction of all fishing regulations (e.g., size limits and gear restrictions) and should not be used for legal compliance.

Source: CDFG 2002.

Table 3.5-13a. General Summary of Commercial Fishing Prohibitions in Southern California (Continued)*

Species	Gear Type	Regulated Season	Regulations
Swordfish & Shark	Drift Gill Nets	May 1 – July 31	Use prohibited within 10 nautical miles westerly, southerly, and easterly of the shoreline of San Miguel Island between a line extending 10 nautical miles west from Point Bennett and a line extending 10 nautical miles east from Cardwell Point and within 10 nautical miles westerly, southerly, and easterly of the shoreline of Santa Rosa Island between a line extending 10 nautical miles west from Sandy Point and a line extending 10 nautical miles east from Skunk Point.
Swordfish & Shark	Drift Gill Nets	Dec 15 – Jan 31	Use prohibited in ocean waters within 25 nautical miles of the mainland coast.
Squid	Round Haul Nets	Jan 1–Dec 31	Season closed from noon Friday until noon Sunday each week.
Yellowtail, barracuda, white seabass, salmon, steelhead, striped bass, and shad	Round Haul Nets		Use prohibited to take these species.
All Species	Trawl Nets		Prohibited out to 3 miles offshore mainland coast. (Except California halibut trawl grounds, 1-3 miles offshore between Pt. Arguello and Pt. Mugu). Special restrictions apply.
Halibut	Trawl Nets	March 15 – June 15	Closed Season - California Halibut Trawl Grounds. Use prohibited in waters 1-3 nautical miles from the mainland shore between Pt. Arguello and Pt. Mugu.
Pink Shrimp	Trawl Nets	Nov 1 –March 31	Closed Season for Pacific Ocean Shrimp.
Prawns & Shrimp	Traps		Use prohibited from Point Conception south to the Mexican border inside 50 fathoms depth.
Spot Prawn	Traps	Nov 1 –January 31	Closed Season between line drawn due west from Pt. Arguello and US-Mexico boundary.
Spot Prawn	Trawl		Use prohibited
Sea urchin (Red)		Various Closures - April through October	In April - May, September - October the closed days are Friday through Sunday. In June and August the closed days are Thursday through Sunday. In July the closed days are Wednesday through Sunday.

Table3.5-13a, Page 2 of 2

*In addition to the species and gear based restrictions shown here, the Channel Islands MPA network prohibits extractive activities in all marine reserves, and limits extractive activities in marine conservation areas. For more information on the Channel Islands MPA network see the FMP (Vol. I) Resource Protection Action Plan.

Source: CDFG 2002.

Table 3.5-13b. General Summary of Recreational Fishing Prohibitions in Southern California*

Species	Regulated Season	Regulations
Abalone		May not be taken
Garibaldi, giant (black) sea bass, gulf and broomtail grouper, canary rockfish, cowcod rockfish, yelloweye rockfish, white shark		May not be taken
Grunion	4/1 – 5/31	Closed Season
Rockfish, cabezon, greenlings, CA sheephead, ocean whitefish, and bocaccio.	1/1 – 2/28	Closed Season for boat-based anglers; open year-round for divers and shore-based anglers.
Rockfish, cabezon, greenlings, CA sheephead, ocean whitefish, and bocaccio	3/1 – 4/15	Take is prohibited in waters greater than 60 fathoms and less than 30 fathoms south of Point Conception.
Rockfish, cabezon, greenlings, CA sheephead, ocean whitefish, and bocaccio	4/16 – 8/31, and 11/1-12/31	Take is prohibited in waters greater than 60 fathoms south of Point Conception.
Rockfish, cabezon, greenlings, CA sheephead, ocean whitefish, and bocaccio	9/1-10/31	Take is prohibited in waters greater than 30 fathoms south of Point Conception.
CA scorpionfish (sculpin)	1/1 – 9/30	Closed Season for boat-based anglers; open year-round for divers and shore-based anglers.
CA scorpionfish (sculpin)	10/1-10/31	Take is prohibited in waters greater than 30 fathoms south of Point Conception
CA scorpionfish (sculpin)	11/1-12/31	Take is prohibited in waters greater than 60 fathoms south of Point Conception
Lingcod	1/1-3/31, and 12/1-12/31	Closed Season for boat-based anglers, divers, and shore-based anglers.
Lingcod	April 1 – April 15	Take is prohibited in waters greater than 60 fathoms and less than 30 fathoms south of Point Conception.
Lingcod	4/16 – 8/31, and November 1-November 30	Take is prohibited in waters greater than 60 fathoms south of Point Conception.
Lingcod	9/1-10/31	Take is prohibited in waters greater than 30 fathoms south of Point Conception.
Lobster	First Thur. after 3/15 to the Fri. before the 1st Wed. in October	Closed Season
Salmon	9/29 – 4/2	Closed Season

* In addition to the species and gear based restrictions shown here, the Channel Islands MPA network prohibits extractive activities in all marine reserves, and limits extractive activities in marine conservation areas. For more information on the Channel Islands MPA network see the FMP (Vol. I) Resource Protection Action Plan.
Note: This is not a complete reproduction of all fishing regulations (e.g., size limits and gear restrictions) and should not be used for legal compliance.
Source: CDFG 2002.

3.5.7 Marine Bioprospecting

Biodiversity prospecting, or bioprospecting, is the activity of seeking a useful application, process, or product in nature. In many cases, bioprospecting is a search for useful organic compounds in microorganisms, plants, and fungi (NPS 2003a). Bioprospecting in the ocean can provide products other than seafood, such as ornamental marine life, raw materials, and medicines. For example, marine bioprospecting collected an extract (arabinosides) from the sponge *Tethya crypta* that led to more than $50 million in annual sales of derived antiviral medicines (NMFS 2001; Norse 1993). The most common use of marine bioprospected materials to date is for the production of pharmaceuticals.

What differentiates marine bioprospecting from other extractive activities (such as commercial fishing or kelp harvesting) is the genetic value of the bioprospected resource. For example, studies of the biomedical properties of various sea cucumber chemical extracts, such as saponins, and chondroiton sulfates, are being conducted by Western medical researchers investigating the efficacy of these substances for pharmaceutical products (Leet *et al*. 2001).

Marine bioprospecting may include sampling and can lead to extraction of a living marine resource for commercial purposes. Within the CINMS, there is no known bioprospecting at this time. However, there are MMS funded research projects investigating the potential beneficial properties of marine life attached to the submerged structure of a sample of offshore oil platforms in the Santa Barbara Channel. The implications of marine bioprospecting within the Study Area are not clearly understood. Nonetheless, removing marine life for bioprospecting may potentially lead to habitat and ecosystem alterations.

3.5.7.1 Regulatory Setting

The NPS (2001) describes its management goal with respect to bioprospecting as follows: "Bioprospecting can sometimes be a consequence of an academic science project. Clearly, such serendipitous bioprospecting is allowed and even encouraged by federal law and NPS policy. Other bioprospectors have a clear goal such as discovering a new medicine or a new enzyme or other useful compound. Targeted bioprospecting is also allowed in the NPS since it is a part of broad scientific inquiry. Harvesting is not allowed. A wide range of scientific inquiry is encouraged and permitted as long as it will not lead to adverse impacts on park resources or values. Biological material is never sold to researchers, nor may they acquire ownership rights in any other way. Just as the National Institutes of Health (NIH) grant permittees license to use biological materials acquired from NIH in exchange for certain negotiated benefits without transfer of ownership, park research permits do not grant any exclusive or propriety rights to the researcher."

The NPS has dealt with this issue and established policies. The NPS (2001) notes: "Any scientist who wants to study microorganisms in national parks must get a research permit. Research permits are only issued to legitimate scientists who can show that they will not harm national parks in any way. Permits are never issued for harvesting natural products. In fact, federal regulations prohibit harvesting of any natural product from national parks. Scientists are only allowed to take small research samples out of the park and they are not allowed to sell or commercialize those research samples. If a scientist makes a practical or useful discovery during his or her research, the scientist's knowledge may be commercialized, but never the national park sample."

3.5.8 Nonconsumptive Recreation and Tourism

Nonconsumptive recreational activities occur primarily in nearshore areas, particularly along the mainland and around the Channel Islands. Examples of common nonconsumptive recreational and tourist-related activities include nonconsumptive diving, boating (including motor boating and sailing),

personal watercraft use (along the mainland shore), whale watching, and kayaking/sightseeing (this would include other wildlife viewing and scenic viewing).

3.5.8.1 Nonconsumptive Recreation and Tourist-Related Use

In 1999, nonconsumptive recreational and tourist-related uses accounted for 42 thousand person-days of use in the CINMS (excluding activity from private boats, which has not been estimated). Twenty-six charter/party/guide services brought passengers to the CINMS. Whalewatching accounted for almost 26 thousand person-days, nonconsumptive diving almost 11 thousand person-days, sailing about 4 thousand person-days, and kayaking/sightseeing a little over 12 hundred person-days.

In 1999, nonconsumptive recreation and tourist-related uses generated over $5 million in income, which supported 179 full and part-time jobs in Santa Barbara, Ventura, and Los Angeles counties. The charter/party/guide service industry received direct revenue from this activity of almost $2.6 million, with net profits of about $83 thousand. In addition, the recreators/tourists received almost $1.5 million in consumer's surplus (nonmarket economic use value) (Leeworthy and Wiley 2003).

CINP Visitation and Activities

There are several types of activities that occur in or near the CINMS that are associated with the CINP. Table 3.5-14 depicts annual visitation to the CINP since 1995. In 2003, an estimated 60,000 people visited and explored the waters associated with the CINP while 30,000 people visited the islands themselves.

Table 3.5-14. Annual Visitors to Channel Islands National Park, 1995–2003

	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Park Visitors	12,600	12,749	17,313	12,365	15,649	12,301	19,388	11,825	60,000

Source: From Channel Islands National Park visitation statistics. 1995–2002. National Park Service Public Use Statistics Office. National Park Service. U.S. Department of the Interior. www2.nature.nps.gov; and 2003 data from www.nps.gov/chis/homepage.

Although many visitors access the CINP by boat, aircraft visitation also occurs. Table 3.5-15 depicts aircraft-based public visitation statistics from the CINP from 1995. The statistics in Table 3.5-15 do not include lesser amounts of air traffic above the northern Channel Islands, including (1) private or commercially hired flights landing on islands to transport persons not visiting the CINP (*e.g.*, The Nature Conservancy property visitors), (2) private or commercially chartered flights transporting Park personnel, and (3) private aircraft flying over the CINMS and CINP.

Table 3.5-15. Aircraft-based Public Visitation for Channel Islands National Park, 1995–2002

	1995	1996	1997	1998	1999	2000	2001	2002
No. of Aircraft Flights to Santa Rosa Island by Park Concessionaires (for Park Visitation Trips only)	18	41	81	112	130	86	57	73
No. of Park-visiting Passengers Aboard Aircraft Flights to Santa Rosa Island by Park Concessionaires	123	207	458	587	763	375	158	456

Source: From Channel Islands National Park visitation statistics. 1995–2002. National Park Service Public Use Statistics Office. National Park Service. U.S. Department of the Interior. www2.nature.nps.gov.

3.5.8.2 Motorized Personal Watercraft

Motorized personal watercraft (MPWC), as defined by the NPS, means a vessel, usually less than 16 feet in length, which uses an inboard, internal combustion engine powering a water jet pump as its primary source of propulsion. The vessel is intended to be operated by a person or persons sitting, standing or kneeling on the vessel, rather than within the confines of the hull. The length is measured from end to end over the deck excluding sheer, meaning a straight line measurement of the overall length from the foremost part of the vessel to the aftermost part of the vessel, measured parallel to the centerline. Bow sprits, bumpkins, rudders, outboard motor brackets, and similar fittings or attachments, are not included in the measurement. Length is stated in feet and inches. 36 CFR 1.4(a).

The following concerns regarding MPWCs were identified during NOAA's review of this issue:

- MPWCs are different from other types of motorized watercraft in their structure (smaller size, shallower draft) and their operational impacts (operated at faster speeds, operated closer to shore, make quicker turns, stay in a limited area, tend to operate in groups, and have more unpredictable movements);

- MPWCs present a current and potential threat to resources and users of the marine environment;

- MPWCs may disturb natural quiet and aesthetic appreciation;

- MPWCs have been operated in such a manner as to create a safety hazard to other resource users in the vicinity and interfered with other marine recreational uses; and

- MPWCs may interfere with marine commercial users.

NOAA’s primary concerns regarding MPWC use in CINMS are the special characteristics that distinguish MPWC from other small vessels and that increase the potential for disturbance of wildlife.

MPWC, also known by the brand names of the popular models Jetski and Waverunner, are small, fast, and highly maneuverable craft that possess unconventionally high thrust capability and horsepower relative to their size and weight. This characteristic enables them to make sharp turns at high speeds and alter direction rapidly while maintaining controlled stability. Their small size, shallow draft, instant thrust, and “quick reflex” enable them to operate closer to shore and in areas that would commonly pose a hazard to conventional boats operating at comparable speeds. Many can be launched across a beach area, without the need for a launch ramp. Many MPWC propelled by a directional water jet pump do not have a rudder and must attain a minimum speed threshold to achieve optimal maneuverability. Special characteristics such as these distinguish MPWC from other small vessels.

Water jet-propelled MPWC gained mainstream popularity in the US in the 1980s, and sales accelerated through the mid-1990s. Their size, power, speed, and sophistication have advanced steadily. Some current models can carry up to four passengers and achieve maximum speeds between 30 and 60 or more miles per hour. Engine size, horsepower ratings, and vessel range and endurance have increased over time. Registrations of personal watercraft have grown more rapidly than other types of boats. Between 1995 and 2003 the number of personal watercraft registered in California grew by more than 62 percent, increasing at an average annual rate of 6.2 percent.

In 2002, the California Outdoor Recreation Plan surveyed California residents on their use of MPWC. According to this survey, 13.6 percent of California residents use MPWC. All residents average 1.7

hours of MPWC use per year, while active participants average 12.4 hours of use per year. MPWC use statistics were not available for previous years (California State Parks 2002).

Outside of CINMS, the recreational use of MPWCs is a year-round activity, with the majority of operators located in the coastal nearshore portion of the Study Area during spring and summer. Along the mainland shoreline, MPWC use originates most commonly from marinas and harbors. In 2002, an estimated 8,335 person-days of activity (from rental and private boats) took place along the shoreline of the Study Area (Ehler and Tetra Tech 2002) and there was one rental business in Santa Barbara. In the two-county area of Santa Barbara and Ventura counties, this activity generated $399 thousand in income (including multiplier impacts), which supported 12 full and part-time jobs in the local economies.

Within CINMS, MPWC use has been very limited. The NPS has banned MPWC use in waters of the CINP, which overlap the first one nmi of CINMS waters, since 2000. As such, MPWC use in that portion of CINMS has been illegal for the last eight years. According to sightings from the Sanctuary's aerial monitoring program, the activity has occurred only rarely within CINMS. However, CINP staff has observed an increase in illegal use of MPWC within the Park over the last several years, and Park staff issue several dozen warnings per year for violation of the NPS MPWC ban (Fitzgerald 2005). In recent winters some MPWC-assisted tow-in surfing has occurred within CINMS near San Miguel Island, but the surfing has taken place beyond the CINP's one nmi boundary.

In general, the use of MPWCs can be controversial due to concerns about their impacts upon: human safety (not addressed here), noise pollution, air and water quality, and wildlife and their habitats.

MPWC technology has improved to reduce noise and pollution, particularly with the use of 4-stroke engines designed to meet increased governmental emissions standards. However, MPWC have also become larger, faster, and more powerful, with extended ranges, and retain the maneuverability characteristics that increase the potential for disturbance of wildlife, including acute turns at high speeds, rapid course alterations, and ability to operate closer to shore and in areas that would commonly pose a hazard to conventional craft operating at comparable speeds. Newer MPWC are quieter than older models under normal displacement conditions. However, such improvements are reduced when MPWC launch into the air off of waves or breaking surf. Also, lower sound intensity (decibel level) does not equally reduce the effects of oscillating sound caused by persistent throttling (revving) of the engine during repeated acceleration/deceleration within the surf zone (which is often necessary to avoid capsizing and pitch polling). Research and observations have shown that this frequent oscillating sound pattern of irregular intensities can be particularly disruptive to wildlife and humans.

MPWC commonly accelerate and decelerate repeatedly and unpredictably, and travel at rapid speeds directly toward shore, while motorboats generally slow down as they approach shore. Accordingly, disturbance impacts associated with MPWC tend to be locally concentrated, producing effects that are more geographically limited yet potentially more severe than motorboat use, due to repeated disruptions and an accumulation of impacts in a shorter period of time.

While industry sponsored studies indicate that MPWCs are no louder than similar motorized vessels under analogous conditions, other studies indicate that because MPWCs often travel repeatedly in the same area, continually leaving and reentering the water, they create rapid cycles of noise that disturb humans and wildlife (Massachusetts Office of Coastal Zone Management (MOCZM) 2002). MPWC use has the potential to interfere with migration, feeding, nesting, and reproduction of wildlife. The maneuverability and shallow-water capabilities of MPWCs allow them to access sensitive and near-shore habitats (MOCZM 2002). Studies have shown that the use of MPWCs in nearshore areas can increase flushing rates, reduce nesting success of certain bird species, impact spawning fish, and reduce fishing success (Burger 1998, Snow 1989). A MOCZM study (2002) proposed a variety of different

management techniques regarding MPWCs, including an outright ban for particularly sensitive or difficult enforcement areas. CINMS fits both of these criteria, with many rare, endangered or sensitive species and a remote environment which makes behavior-based enforcement very difficult without extensive enforcement resources.

The National Park Service (2000, 2004) identified several of these impacts along with interruption of normal activity, avoidance and displacement, loss of habitat use, interference with movement, direct mortality, interference with courtship, alteration of behavior, change in community structure, elevated noise levels, and damage to aquatic vegetation. Further, offshore marine mammals or surfacing birds may be unaware of the presence of these vehicles due to their low frequency sound; when the inability to detect the vehicles is combined with their high speed and rapid and unpredictable movements, both animals and operators are at risk (Snow 1989).

See also the discussion of MPWC in sections 2.0 and 4.0.

3.5.8.3 Recreational Boating

Sailing and boating are popular recreational activities within the CINMS and larger Study Area. The Channel Islands are within reach of several ports for single or multi-day trips (CDFG 2002). Motorboats (including sailboats when using motors) yield impacts such as noise, and air and water pollution, which vary depending on factors such as the size, condition, and type of engine used. Vessels under sail and motor power have the potential to disturb marine life directly, and using and setting anchors can cause seabed disturbances.

Kayaking, when done responsibly, is a virtually no-impact sport. However, disturbance to seabird colonies and nesting sites may occur when kayakers travel too close to these sensitive areas. To avoid predators, cormorants, pelicans, oystercatchers and other seabirds roost on ledges, rocks, and pinnacles away from land. These roosting areas are, however, often within the range of kayakers. If approached too closely, these birds will abandon their rookeries, leaving nests and young. Three species of seabirds, pigeon guillemots, oystercatchers, and Xantus's murrelets, nest in caves and are very susceptible to disturbance by kayakers entering these caves. A single disturbance may cause the loss of an entire season's young. In addition, pinnipeds at haul-out and rookery areas are very susceptible to a close approach from a kayak or small boat. Such animals will stampede into the water if approached too closely. With larger species such as California sea lions and northern elephant seals, pups can be trampled to death in a stampede. Chronic disturbances have resulted in the abandonment of some rookeries and haul-out sites in various regions.

See the previous section for a discussion of MPWC.

Boat Landings and Boat Landing Structures within the CINMS

There are several structures located on the Islands to accommodate boat landings. Primary structures associated with the northern Channel Islands include:

Anacapa Island. There are two moorings near the landing cove at East Anacapa Island. These are reserved for use by the NPS, USCG, and the NPS concessionaire. Private boaters must anchor a reasonable distance from these moorings.

Santa Cruz Island. Private boaters may land on the eastern 24 percent of Santa Cruz Island without a permit at any time. This area is managed by the NPS and is east of the property line between Prisoners Harbor on the north side and Valley Anchorage on the south side.

Santa Rosa Island. Boaters may land along the coastline and on beaches with a permit for day-use only. Beaches between and including Skunk Point and East Point are closed from March 1st to September 15th in order to protect the threatened western snowy plover (a seabird). Sandy Point at the west end is closed to landings year round. There is also a pier at Bechers Bay.

San Miguel Island. There are no piers or moorings at San Miguel Island; therefore, all private boaters must anchor. Overnight anchorages are restricted to Cuyler Harbor and Tyler Bight. Visitors may land only on the beach at Cuyler Harbor. No landing is allowed on rocks or islets.

Santa Barbara Island. The landing dock is available for unloading purposes only. No craft, including kayaks and inflatables, should be left moored to the dock.

In 1999, eight for-hire operations accounted for over 4,000 person-days of sailing and four operators accounted for over 12 hundred person-days of kayaking/sightseeing in the CINMS (information on private boats is not available). These operations received revenue of about $390 thousand and earned a little over $27 thousand in profit from these activities. These activities generated over $797 thousand in income, which supported 24 full and part-time jobs in Ventura and Los Angeles counties. In addition, those that participated in these activities received over $189 thousand in consumer's surplus (nonmarket economic use value) (Leeworthy and Wiley 2003).

3.5.8.4 Non-Consumptive Diving

If done correctly and if visits to any one site are minimized, non-consumptive diving can have limited impacts on marine habitats and can be an excellent mechanism for accessing and enjoying Sanctuary resources. However, overuse of popular locations or poor diving techniques can result in damage to CINMS resources including living marine resources and their habitats, and submerged cultural resources. Benthic organisms are susceptible to divers intentionally or accidentally holding, touching, picking up, or covering organisms with sand. Divers entering from the beach can also impact rocky shore habitats.

In 1999, seven for-hire operations accounted for almost 11,000 person-days of nonconsumptive diving in the CINMS (information on nonconsumptive diving from private boats was not available). These seven operations received about $688,000 in revenue and earned about $46,000 in profit from this activity. This activity generated almost $1.6 million in income, which supported 47 full and part-time jobs in the three-county area of Santa Barbara, Ventura, and Los Angeles counties (including multiplier impacts). In addition, those participating in nonconsumptive diving received about $389 thousand in consumer's surplus (nonmarket economic user value) (Leeworthy and Wiley 2003).

3.5.8.5 Surfing and Windsurfing

Numerous popular surfing areas exist along the mainland shorelines within the Study Area. In addition, there are several surfing areas located around the Channel Islands, although they are not well documented. Boat or shore-based access to surfing and windsurfing areas has the potential to create disturbances of sensitive marine mammals or seabirds.

3.5.8.6 Wildlife Viewing

Wildlife viewing, especially whalewatching, occurs along the coast and at the islands. Whalewatching in the Channel Islands is extremely popular due to the high frequency of sightings and diversity of marine mammals to be seen. Day trips are offered from several area landings including Santa Barbara, Ventura, and Channel Islands harbors. Whalewatching can have negative effects on whale behavior when conducted improperly. Boats that approach too fast or too close can disrupt whale feeding, mating,

migration, and other activities. Vessels can stay with the whales too long, especially when other vessels are waiting their turn for a closer look. Observations of interactions between humpback whales and vessels (including but not limited to whale watching vessels) have included whales approaching vessels, directing threats at vessels, and avoiding vessels by altering their behavior (*e.g.*, increasing dive time, reducing surface time, surfacing without blows, initiating dives without raising flukes, and altering direction away from approaching vessels) (Au *et al.* 2000). Au *et al.* (2000) concluded that noise from vessels representative of the humpback whale watching industry in Hawaii, and maintaining the standoff distance of 91 meters required in Hawaii, should not cause harm to the whales' auditory systems. However, this study did not yield evidence as to whether or not the presence of the vessels, and the noise they generate, led to behavioral changes in the observed whales. Researchers studying killer whale watching in an ecological reserve in British Columbia found that the likelihood of whales leaving the reserves increased as increasing numbers of boats entered the area (Williams *et al.* 2002). Williams *et al.* (2002) found that in an experimental setting in which a vessel maintained a distance of 100 meters from killer whales, male killer whales covered 13% more distance along a circuitous path than that covered before the boat arrived, while female killer whales swam 25% faster. Beyond observations in experimental conditions, Williams *et al.* (2002) observed actual whale watching activities and found that: as boats got closer to males their swimming paths became less direct, they tended to swim faster, and their surface behaviors increased; as the number of whale watching boats increased the males' paths became more direct, they tended to swim slower, and their surface behaviors decreased; as boats got closer to females their paths were erratic but directional, and their dives tended to be shorter; as the number of boats increased the females' paths were less direct, and their dives were shorter. These observations likely result from the cumulative effect of numerous factors rather than a simple response of whales to whale watching vessels (*e.g.*, age of animals, date and time of observation, total number of vessels, proximity of nearest vessel to whales) (Williams *et al.* 2002); however, these examples are indicative of whales altering their behavior in the presence of whalewatching vessels. The implications of such behavioral modifications are not well understood. The effects of vessel-based wildlife viewing coupled with other vessel traffic can have a negative cumulative impact on whales.

In 1999, eight for-hire operations accounted for almost 26,000 person-days of whalewatching activity in the CINMS (information on whalewatching from private boats is not available). These eight operators received about $1.5 million in revenue and earned a little over $9,000 in profits from this activity. This activity generated over $3.6 million in income (including multiplier impacts), which supported 108 full and part-time jobs in Santa Barbara and Ventura counties. In addition, whalewatchers received almost $938,000 in consumer's surplus (nonmarket economic user value) from their whale watching activities in the CINMS (Leeworthy and Wiley 2003).

3.5.8.7 Regulatory Setting

The NPS currently prohibits the use of MPWCs within waters of the CINP.

3.5.9 Department of Defense Activities

The U.S. Air Force and U.S. Navy conduct training exercises, provide logistic support, and conduct military testing and evaluation projects for aircraft, ship, and missile programs in the Study Area. Vandenberg Air Force Base (AFB), and the Naval Base Ventura County (NBVC) at the Point Mugu and Port Hueneme coastal areas are the primary locations for these testing and training exercises. The following presents an analysis of the current level of U.S. Air Force and U.S. Navy military activities in the Study Area. Finally, operations of the USCG are discussed.

3.5.9.1 Vandenberg AFB

Overview

Vandenberg Air Force Base (AFB) is located on California's central coast between Los Angeles and San Francisco, about 55 miles northwest of Santa Barbara. Vandenberg's unique location provides 42 miles of Pacific Ocean shoreline, over 99,000 acres of varied terrain and restricted airspace for spacelift, ballistic test, aeronautical operations, and military exercises. A 15,000-foot runway, boat dock, railway system and several major highways service Vandenberg AFB.

North Vandenberg has a coastline facing west while much of the South Vandenberg coastline faces south. This unique geography permits launch azimuths ranging from 147 to 300+ degrees, enabling over-ocean ballistic and polar space launches. Vandenberg is the only location in the continental United States where spacecraft can be launched into polar orbit without overflying land. In addition, the West Coast Offshore Operating Area (WCOOA) provides about 200,000 square miles of over-water and sea-land transition zones for aeronautical and cruise missile testing.

The types of activities conducted at Vandenberg AFB which have or may have an impact on marine resources can be categorized into the following areas:

- Spacelift Operations;
- Intercontinental Ballistic Missile and Missile Defense Testing and Operations;
- Missile Testing and Aircraft Operations;
- Military Training Exercises; and
- Boat Dock Operations.

A description of each category is provided below.

Spacelift Operations

Spacelift operations consist of launching rockets for the purpose of inserting satellites into earth orbit. Launch vehicles, such as, but not limited to Titans, Atlas and Deltas, are generally composed of multiple stages that are stacked one upon another. Each stage consists of a rocket motor and a supply of propellant (fuel and oxidizer). After the propellant in one stage is consumed, the entire stage is jettisoned from the rest of the launch vehicle and the next stage is fired to resume powered flight. Some launch vehicles are configured with two or more strap-on boosters, which are attached to the sides of the launch vehicle. Strap-on boosters and the vehicle's first stage are fired concurrently in order to provide additional thrust during the initial minutes of flight.

Spent booster stages, strap-on boosters, and other launch vehicle debris are jettisoned into the Pacific Ocean during spacelift operations. Such objects could fall almost anywhere within the CINMS Study Area. Current launch rates indicate up to 5 launches overfly the current CINMS boundary of which one overflies San Miguel Island directly. Presently all spent stages for these trajectories impact outside the CINMS. Historically launch rates for spacelift (southerly trajectories) have varied and future launch rates are subject to change based on mission need. Eleven spacelift operations occurred between 1997, 1998 and 1999. In 1966, the number of spacelift launches peaked at about 46. Future projected launch profiles do not deposit spent stages inside the CINMS.

The need to insert payloads into polar and other highly inclined orbits drives the requirement to launch spacelift vehicles along a wide range of southerly launch azimuths. In addition, different launch vehicles have dissimilar hardware and dissimilar flight characteristics, which further expands the region where launch vehicle debris could fall into the ocean. Active precautionary measures are in place to minimize the likelihood of jettisoned objects falling in the Sanctuary or on oil platforms.

As previously mentioned, a typical booster stage consists of a rocket motor and a large tank used for storing propellant. The size of booster stages vary from vehicle to vehicle, but some of the larger booster stages can have a 10-foot diameter and be nearly 90 feet in height. Large strap-on boosters can have a 10-foot diameter and exceed 110 feet in height. Booster stages, which consist primarily of metal components, fall into the ocean after their propellant has been consumed. Residual amounts of propellant may reside inside booster stages when they fall into the ocean.

Jettisoned objects sink to the ocean floor and are not recovered due to the extreme difficulty in locating and recovering such objects in deep ocean waters. Furthermore, the high costs associated with deep recovery operations would be prohibitive. On rare occasion, launch anomalies occur. Variously sized fragments from a destroyed vehicle as well as pieces of unburned solid propellants could be dispersed over a wide area potentially inside portions of CINMS and the Study Area. Liquid propellants would likely burn during the explosion or evaporate shortly thereafter. To date, no "scheduled" or planned spent stages have fallen within the CINMS. There was a launch failure (Titan IV in Aug '93), however, that deposited debris in the CINMS area.

The Department of Defense (DoD), the National Aeronautics and Space Administration (NASA), other government agencies, and various commercial enterprises conduct Spacelift operations at Vandenberg AFB. As the appointed executive agent for space, the Air Force is responsible for ensuring public safety. As such, positive control measures are employed during all missile and space launch activities. All launch vehicles are equipped with flight termination packages and tracking systems that offer operators the ability to terminate thrust or destroy vehicles that follow non-nominal trajectories. DoD personnel are entrusted with this responsibility during powered flight (the phase of flight when thrust is provided by engines/motors that includes overflight of the Sanctuary and Study Area). In this role, DoD is responsible for positive flight termination actions taken for all launches whether they are DoD, civilian, or commercial in nature.

Intercontinental Ballistic Missile and Missile Defense Testing and Operations

Vandenberg AFB is the primary location in the United States where Intercontinental Ballistic Missiles (ICBMs) are launched for testing purposes. Ballistic missiles, such as, but not limited to, Peacekeeper and Minuteman, are usually launched to targets located near the Kwajelein Atolls in the South Pacific; however, some missiles are launched to targets in other broad ocean areas. The impact of ballistic missile testing is similar to the impact of spacelift operations.

Spent booster stages fall into the Pacific Ocean during ICBM testing operations. Highly variable testing configurations result in jettisoned objects falling over a wide area of the ocean. Jettisoned objects, and other missile debris, sink to the ocean floor and are not recovered due to the extreme difficulty in locating and recovering such objects in deep ocean waters. Furthermore, the high costs associated with deep recovery operations would be prohibitive. No ICBM missiles have deposited spent stages in the CINMS area. Future missile defense testing could overfly the CINMS; however, none are planned to deposit spent stages in the CINMS.

Missile intercept operations also occur from Vandenberg AFB, where a target missile is destroyed down range by an interceptor missile, laser, or other weapon system. Missile intercept operations result in

debris being dispersed over a wide area of the ocean and potentially inside portions of the CINMS Study Area. Active precautionary measures are in place to minimize the likelihood of jettisoned objects falling in the Sanctuary or on oil platforms.

On rare occasion, ICBM and missile defense launch anomalies occur. Variously sized fragments from a destroyed vehicle as well as unburned solid propellants and some unburned liquid propellant (upper stages such as post boost vehicles), could be dispersed over a wide area potentially inside portions of the CINMS Study Area, but ICBM past anomalies have not deposited debris in the CINMS.

ICBM and missile defense testing operations at Vandenberg AFB are conducted by DoD. As the appointed executive agent for space, the Air Force is responsible for ensuring public safety. As such, positive control measures are employed during all missile and space launch activity. All launch vehicles are equipped with flight termination packages and tracking systems that offer operators the ability to terminate thrust or destroy vehicles that follow non-nominal trajectories. DoD personnel are entrusted with this responsibility during powered flight (the phase of flight when thrust is provided by engines/motors that includes overflight of the Sanctuary and Study Area).

Missile Testing and Aircraft Operations

Extending 200 miles offshore and traversing the entire west coast of the United States, the WCOOA provides, per DoD, the ideal airspace for testing military and civilian aircraft, ballistic missiles, guided missiles, and other weapon systems. Most WCOOA tests are conducted off the California coast due to the stable air mass, and due to the radar, telemetry, and optical sensors at Vandenberg AFB and the Naval Air Warfare Center at Point Mugu.

Different types of ballistic and guided missiles are launched from land, sea, and air (over water) for various reasons, including, but not limited to, testing guided missiles, intercept technologies for a national missile defense system, and testing anti-aircraft artillery. The target area for some short-range missiles may only be a couple miles offshore, which could result in missile debris being deposited into the CINMS Study Area.

Active precautionary measures are in place to minimize the likelihood of jettisoned objects falling in the Sanctuary or on oil platforms. Currently, no past (or projected future) missile system launched from VAFB deposited spent stages in the CINMS area. Past aircraft overflight operations have occurred inside the CINMS, and such activity is expected to continue in the future, however.

Other operations conducted in the WCOOA consist of aircraft and aeronautical test operations. Airspace corridors (over-land and over-water) are routinely used for aircraft flight test operations. In addition, aircraft from other military installations routinely use the 15,000-foot landing strip at Vandenberg AFB for refueling and training exercises. Training exercises, involving both fixed wing and rotor aircraft, are conducted at all altitudes within the CINMS Study Area. Devices used for training include, but are not limited to, flares, chaff, and sea dye. Water survival training is also conducted within the study area, which consists of, but is not limited to, simulating emergency egress through a cockpit, practicing life raft usage, and hoisting people from the ocean. Low altitude flights near the shore of the islands are infrequent, but do occur occasionally.

Missile testing and aircraft operations in the WCOOA are conducted by DoD. As the executive agent for space, the Air Force is responsible for ensuring public safety. As such, positive control measures are employed during all missile and space launch activity. Except for some small missile systems having a maximum affected flight area entirely over water and away from populated areas (including oil platforms), all launch vehicles are equipped with flight termination packages and tracking systems that

offer operators the ability to terminate thrust or destroy vehicles that follow non-nominal trajectories. DoD personnel are entrusted with this responsibility during powered flight (the phase of flight when thrust is provided by engines/motors that includes overflight of the Sanctuary and Study Area).

Military Training Exercises

Periodically, the Vandenberg AFB shoreline is used for military training exercises, which usually involve the movement of military personnel from ocean vessels and aircraft to the shore.

Boat Dock Operations

Vandenberg AFB is serviced by a boat dock. Boat dock operations include, but are not limited to, the unloading of rocket motors and large booster segments from barges. The boat dock is located within the CINMS Study Area and will require to be dredged from time to time.

Launch Discussion

Current launch rates indicate that up to 5 launches overfly the current CINMS boundary, of which one overflies San Miguel Island directly. Presently all spent stages for these trajectories impact outside the CINMS.

Table 3.5-16. Space Vehicle Launches from Vandenberg Air Force Base, Sonic Boom Measurements, Northern Channel Islands

Launch Vehicle	Date	Launch Site	Island Monitoring Location	Sonic Boom Peak Amplitude (psf)	Sound Exposure Level (dB) [A-weighted]
Titan IV	12 May 1996	SLC-4E S. VAFB	Crook Point, San Miguel	8.97	97.2
Titan IV	23 Oct 1997	SLC-4E S. VAFB	Kinton Point, Santa Cruz	1.1	86.8
Athena 2	27 Apr 1999	SLC-6 S. VAFB	Adams Cove, San Miguel	0.95	73.4
Titan IV	22 May 1999	SLC-4E S. VAFB	Harris Point San Miguel	1.84	78.5
Athena 2	24 Sep 1999	SLC-6 S. VAFB	Point Bennett, San Miguel	0.96	68.3
Delta II	21 Nov 2000	SLC-2 N. VAFB	Point Bennett, San Miguel	0.4	91.5
Atlas II	8 Sep 2001	SLC-3E S. VAFB	Cardwell Pt., San Miguel	0.75	79.4
Delta II	18 Oct 2001	SLC-2 N. VAFB	Point Bennett, San Miguel	0.0	83.5 (unweighted)
Delta II	11 Feb 2002	SLC-2 N. VAFB	Point Bennett, San Miguel	0.64	84.7
Atlas II	2 Dec 2003	SLC-3E S. VAFB	Point Bennett, San Miguel	0.88	99.310/7/2004

References: SRS Technologies monitoring reports

Historically launch rates for spacelift (southerly trajectories) have varied and future launch rates are subject to change based on mission need. Eleven spacelift operations occurred between 1997, 1998 and

1999. In 1966, the number of spacelifts peaked at about 46. Future projected launch profiles do not deposit spent stages inside the CINMS.

For CINMS, the National Marine Fisheries Service programmatic take permit would be the only applicable existing requirement. Under this permit the Air Force is required to conduct modeling to predict the likelihood of a sonic boom impacting the Channel Islands. No significant impacts have ever been detected, but pinnipeds on the Channel Islands may be briefly disturbed by sonic booms and the take permit allows for this level of impact.

3.5.9.2 United States Navy

The U.S. Navy has an extensive presence in Southern California through installations, offshore operating areas, and ranges (offshore as well as inland). Within the study area, installations are located at Point Mugu and Port Hueneme in Ventura County. These two facilities comprise the unified base command known as Naval Base Ventura County (NBVC). The installations at Point Mugu and Port Hueneme are composed of approximately 6,000 acres of prime real estate and include an airfield, a port facility and light industrial activities. The installations host various Naval activities including the Pacific Fleet Seabee units, Pacific Fleet Early Warning Aircraft (E-2) squadrons, the Naval Surface Warfare Center Port Hueneme Division, the Naval Facilities Engineering Service Center, and Naval Air Warfare Center Weapons Division (NAWCWD), as well as a variety of other tenant organizations.

NAWCWD Point Mugu operates and controls the Point Mugu Sea Range, a 36,000 square mile area of military controlled airspace off the Southern California Coast (see figure 3.5-6). Although some Navy operations in the study area occur outside the Sea Range, most are conducted within the Sea Range boundaries. The Sea Range includes airspace overlying significant portions of the existing Sanctuary (78% of the Sanctuary) as well as the airspace above the land areas of several of the Channel Islands.

Figure 3.5-6. Point Mugu Sea Range

The Sea Range was established in 1946 after an extensive nationwide search for an operationally realistic ocean site to conduct testing and development of missiles and other Naval systems. The unique geography of this region, including coastal mountains, offshore islands, convex coastline and relatively good weather, led to the selection and designation of the Sea Range.

The Sea Range continues today to provide the Navy an operationally realistic environment for safely conducting controlled air, surface, and subsurface Navy testing and training. The combination of the geographic factors, instrumentation sites, unique test capabilities, proximity to Naval Forces, and highly skilled workforce provides the most advanced and efficient method for conducting weapon system tests and Fleet training necessary to ensure the readiness of Pacific Fleet units.

In addition to the Navy's presence within the Study Area, the Navy maintains substantial installations, operating areas and training ranges that rely on and enhance the Navy's presence at Point Mugu Sea Range and NBVC. Approximately one-quarter of the United States Fleet is stationed in San Diego, including three aircraft carriers. In addition, the United States Marine Corps maintains a significant presence at Marine Corps Base Camp Pendleton. As part of their interdeployment training cycle, these forces utilize the Point Mugu Sea Range, other operating areas off Southern California, and training ranges as far inland as Nevada and Arizona as they progress from basic unit level training through advanced task force exercises in preparation for the missions they anticipate conducting during overseas deployments. These operations range from single units to battle groups and multi-national exercises.

The Navy conducts a wide variety of activities within the Study Area and boundaries of the existing Sanctuary in support of operational training and testing. The exact activities vary based on current operational requirements, evolving technologies, and world events. The following sections describe baseline categories of activities that occur within the Channel Islands National Marine Sanctuary and the associated Management Plan Study Area.

Vessel, Aircraft, and Target Operations

Within the Study Area and Sanctuary, the Navy operates the full range of Navy ships, submarines, aircraft, weapons systems, sensors, and targets, including those based at Point Mugu and Port Hueneme, as well as those from other bases. In addition, foreign military units often participate with the Navy in testing and training operations.

U.S. Navy vessels operating in the area, including aircraft carriers, destroyers, cruisers, submarines, and various amphibious and small craft, utilize the Sea Range for testing, training, and experimentation. Also, the U.S. Navy operates a small fleet of specialized support boats and several larger vessels (ships) that support Sea Range operations. Operation of these vessels includes, but is not limited to, transits and operation of all shipboard systems. Ships routinely conduct anti-submarine warfare, surface-to-surface and surface-to-air warfare training, testing, and experimentation. They also perform maritime intercept operations and escort training. These are missions they are routinely required to perform during overseas deployments.

Within the Sanctuary, normal routine vessel operations are located primarily in areas outside 1 nmi from the islands. Operations closer to the islands would normally be transit and vessels seeking shelter from weather conditions. However, the exact location of vessel operations is dictated by safety and mission requirements. Navy vessels do not discharge or exchange ballast water within the Sanctuary.

Aircraft operations include transits, air-to-air and air-to-surface operations involving both manned aircraft and unmanned air vehicles. Aircraft operations occur throughout the area at various altitudes and speeds, including supersonic operations. Overflight of the shorelines of the Channel Islands is normally above 1,000 feet, unless a lower altitude is required to accomplish the mission or training objective (*e.g.*, low-level helicopter flight training). Requirement for such lower altitude flights over shorelines of the islands are rare (several per year) and are carefully planned to minimize noise impacts. Aircraft flights originate from Point Mugu, other bases, and ships at sea.

Targets operated in the study area include both airborne and surface (boats/ships) targets. Airborne targets are remotely controlled and used to test weapon systems such as missiles or radar systems. They range from small missile-size to full airplane size and are designed to be recovered and reused. However, some targets are not recovered or are intentionally intercepted and destroyed. Aerial targets are launched from Point Mugu, San Nicolas Island, surface vessels, or aircraft. Surface targets are remote controlled vessels designed for testing or training in situations where personnel cannot safely be on-board. There is

a wide range of surface targets used on the Sea Range. Normally surface targets are designed to withstand extensive damage for reuse. However, some targets include vessels ("hulks") that are intentionally sunk. Lastly, underwater targets are also used by submarines and torpedoes for testing and training. Target operations that involve missile intercepts or sinking targets are rarely performed within the Sanctuary and are not currently done in the areas close to the islands.

Weapon Activities

The mission of Sea Range is to provide an operationally realistic location to test and evaluate weapon systems as well as to conduct training in the use of these weapon systems. The weapon systems employed cover the breadth of Navy (and DoD) weapons systems, including both offensive and defensive systems. There is an emphasis on missile and air warfare systems. These weapons systems activities generally occur south of the northern Channel Islands or in the vicinity of San Nicolas Island but may occur in other locations within the Study Area. Within the Sanctuary boundary, weapon activities are unusual and very limited in scope (*e.g.*, overflight). Missile flights (and their associated safety chase aircraft) in the Sanctuary boundary normally occur over ocean areas. In general, the categories of weapons can be classified as guns, bombs, missiles, and torpedoes. These weapon systems often do not use live warheads, but actual live fire of weapons does occur. Debris from intercepts is not recovered. The scenarios and conditions employed vary widely depending on the specific weapon system, operational requirement, and platform (aircraft, ship, submarine) employed. For simplicity, weapon systems activities can generally be described in the following categories:

- *Air-to-Air*: Typical scenario would involve aircraft firing missiles at airborne targets and aircraft engaged in air combat maneuvering. Missiles rarely fly over the Sanctuary and such overflight operations are normally above 1,000 feet. The nature and scope of air-to-air activities involving aircraft firing missiles is documented within the Point Mugu Sea Range Environmental Impact Statement.

- *Air-to-Surface*: Typical scenario would involve aircraft firing weapons against surface (boat) targets or the target complex at San Nicolas Island. Firing of weapons from aircraft at targets does not normally occur within the existing Sanctuary boundary. When weapons are used against surface targets within the Sea Range, protective measures are in place to increase situational awareness of the training participants to minimize and avoid takes of marine mammals under the Marine Mammal Protection Act and Endangered Species Act. The nature and scope of air-to-surface weapons use is documented within the Point Mugu Sea Range Environmental Impact Statement.

- *Surface-to-Air*: Typically involves either ships firing weapons against airborne targets or weapons launched from Point Mugu or San Nicolas Island against airborne targets. Because of safety considerations, surface-to-air weapons are not normally used within the Sanctuary boundary. Debris is not normally recovered on the Sea Range. The nature and scope of surface-to-air weapons use is documented within the Point Mugu Sea Range Environmental Impact Statement.

- *Surface-to-Surface*: Typical scenario would be ships or weapon systems at Point Mugu or San Nicolas Island firing missiles or guns against surface targets (either vessels or the SNI target complex). Although missiles and targets are fired from Point Mugu seaward into the Sea Range approximately 150 times per year, they rarely fly directly over the Sanctuary boundary. Details of how these activities are conducted are analyzed in the Point Mugu Sea Range Environmental Impact Statement.

- *Subsurface-to-Surface*: Involves submarines firing missiles or torpedoes at surface vessels or land targets. Use of missiles and torpedoes may occur several times each calendar year depending on sea state and operational requirements. Because of safety considerations, these activities do not occur within the existing Sanctuary boundary. These activities are carefully scheduled in advance and require commanders involved in each event to utilize protective measures designed to increase situational awareness of exercise participants to avoid takes under the Marine Mammal Protection Act and Endangered Species Act.

- *Subsurface-to-Subsurface*: Involves submarines firing torpedoes at undersea targets. These engagements may occur several times each calendar year depending on sea state and operational requirements. Because of safety considerations, these activities do not occur within the existing Sanctuary boundary. These activities are carefully scheduled in advance and require commanders involved in each event to utilize protective measures designed to increase situational awareness of exercise participants to avoid takes under the Marine Mammal Protection Act and Endangered Species Act.

- *Surface-to-Subsurface*: Involves ships firing missiles or torpedoes at undersea targets. These activities may occur several times each calendar year depending on sea state and operational requirements. Because of safety considerations, these activities do not occur within the Sanctuary boundary. These activities are carefully scheduled in advance and require commanders involved in each event to utilize protective measures designed to increase situational awareness of exercise participants to avoid takes under the Marine Mammal Protection Act and Endangered Species Act.

- *Air-to-Subsurface*: Involves aircraft firing torpedoes at undersea targets. Use of torpedoes may occur several times each calendar year depending on sea state and operational requirements. Because of safety considerations, these activities do not occur within the Sanctuary boundary. These activities are carefully scheduled in advance and require commanders involved in each event to utilize protective measures designed to increase situational awareness of exercise participants to avoid takes under the Marine Mammal Protection Act and Endangered Species Act.

The Sea Range has an extensive and well-established safety program that ensures all areas of potential hazard are clear of non-participants. This program includes public notifications as well as radar and physical searches of operating areas prior to commencement of operations.

Submarine and Antisubmarine Warfare

Submarine operations include, but are not limited to, transits, anti-submarine operations and anti-surface vessel operations. Antisubmarine warfare operations in the Study Area include submarine, deep submergence vehicle, surface vessel, and aircraft operations designed to detect, locate, and prosecute threat submarines or underwater warfare platforms. As discussed above, these operations include torpedo operations and the use of both passive and active acoustic devices. These acoustic devices may be autonomous (*e.g.*, sonobuoys or remote controlled undersea vehicles) or be connected to vessels or aircraft (*e.g.*, sonar systems). Acoustic sources are tonal and explosive and are used for seeking out submarines as well as communicating with U.S. and foreign submarines. Antisubmarine warfare activities also include deployment, maintenance, and abandonment of equipment secured to the ocean bottom, such as cables, hydrophones, or sonar arrays. In addition, naval aviation units conduct anti-submarine warfare training well below 1,000 feet in the Study Area. Within the Sanctuary, submarine and antisubmarine warfare operations are rare and normally limited to transitting/manuevering in the area and passive acoustic systems. To the extent active acoustic devices are used, the precise frequency levels

are classified but protective measures are used by training exercise planners to increase situational awareness of unit commanders to ensure received levels by marine mammals in the area of acoustic activity do not result in takes under the Marine Mammal Protection Act and Endangered Species Act.

Mine Warfare

Mine warfare operations include, but are not limited to, mine laying from aircraft, surface vessels and submarines as well as mine sweeping. Within Bechers Bay off Santa Rosa Island, the Navy periodically conducts inert mine drops. On average there are two multi-aircraft mine drop exercises annually. The inert mines are steel jacketed concrete shapes that are often recovered for reuse (roughly 50% recovered). The mine shapes are dropped from aircraft for shallow water minefield deployment training. The drops are done only after following safety clearance procedures, which ensure the area is clear of all non-participants.

Amphibious and Special Warfare

Amphibious warfare operations in the study area include, but are not limited to, surface vessels, subsurface systems, swimmers, and aircraft/helicopter operations designed to land and secure beaches for subsequent land based operations. The training exercises include manned raids, small craft landing, and special operations force insertions from aircraft, surface vessels or submarines at Point Mugu, Port Hueneme, Vandenberg Air Force Base and oil platforms. Landing operations are not conducted at the islands within the Sanctuary.

Explosive Ordnance Disposal

Explosive Ordnance Disposal operations include, but are not limited to, the location, assessment, disarming and, in some cases, detonation of ordnance and missile propulsion systems. With the exception of an emergency or safety disposal, these activities are not conducted within the boundary of the Sanctuary.

Decoys

To provide operationally realistic testing and training the Sea Range scenarios described above often also include the use of decoys, which are devices designed to reduce weapon system effectiveness by confusing sensor systems. Decoy use includes, but is not limited to, chaff, obscurants, flares, and undersea acoustic devices. The use of decoys occurs throughout the Sea Range and may inadvertently occur within the boundary of the Sanctuary. Use of decoys within the Sanctuary boundary is rare because the types of activities being conducted do not normally occur within the Sanctuary boundary.

Chaff consists of aluminum strips deployed from aircraft or ships to confuse radar systems. Obscurants consist of smoke used in the study area that is deployed from ships or aircraft and is designed to confuse sensor systems. Flares consist of incendiary devices of two types: defensive flares fired from ships or aircraft designed to confuse heat-seeking missiles, and illumination flares fired from ships designed to provide surface illumination during darkness. Undersea decoys consist of devices that emit acoustic energy and are designed to confuse sensor systems.

Maintenance, Replacement, Removal, and Abandonment of Existing Facilities

Facilities that must be maintained, replaced periodically, or removed or abandoned include permanent facilities at the Navy installations and sites (*e.g.*, pier side maintenance) as well as ocean submarine cables, and other miscellaneous facilities and equipment. Examples include, but are not limited to,

hydrophone arrays, communications cables linking the mainland to the offshore islands, or submarine communication systems. A portion of an undersea communication cable running from Point Mugu to San Nicolas Island passes through the existing Sanctuary. Removal of this cable is not anticipated in the foreseeable future. Maintenance of this cable is conducted on a regular and as-needed basis.

Marine Research and Surveys

The Navy conducts oceanographic research and surveys within the Study Area. This activity involves the use of sound sources; sampling; placement of ocean bottom equipment, weather balloons; and the use of vessels, divers, submarines, and satellites. Diving is also conducted for training and in support of other operations. Research and surveys within the Sanctuary are not conducted frequently.

Anchoring of Ships and Vessels

Naval vessels routinely anchor within the Study Area at various locations. Examples include, but are not limited to, range support boats anchoring during bad weather as well as long-term anchoring or mooring of surface target vessels. Vessels larger than 300 gross tons do not normally anchor within the Sanctuary and would rarely be within 1 nmi of the islands within the Sanctuary.

Harbor Operations

The Navy operates the harbor at Port Hueneme. It is used for berthing of permanently assigned vessels and visiting ships. A portion of the harbor is leased to the Oxnard Harbor District for commercial use. Ships routinely transit through the proposed concept areas as part of naval operations.

Logistics Operations

Various logistics operations occur within the Study Area to support the testing, training, and experimentations operations described above. These include, but are not limited to, refueling operations (both planes and underway vessels), replenishment/re-supply operations (*e.g.*, barges, supply ships, etc.), vessel towing, and salvage activities.

3.5.10 U.S. Coast Guard Activities

The Coast Guard conducts search and rescue, marine safety, environmental protection, law enforcement, spill response, aids to navigation maintenance, homeland security, national defense, training operations and other activities to support its missions within the Study Area.

The USCG operates a Marine Safety Detachment, two 87-foot coastal patrol boats (USCGC *Blackfin*, homeported in Santa Barbara and USCGC *Blacktip* homeported in Oxnard), and a small boat station (Station Channel Islands Harbor). There is also an additional small boat station at Morro Bay (Station Morro Bay).

Station Channel Islands Harbor has four boats used for search and rescue (SAR) and law enforcement (LE). These include two 25 foot boats, a 41 foot utility boat and a 47 foot motor lifeboat.

The USCGC *Blackfin* is used for SAR and various LE operations such as homeland security patrols, drug and migrant interdiction, fisheries enforcement, and recreational boating safety.

The Marine Safety Detachment conducts pollution response, marine casualty investigations, and by working through a Memorandum of Understanding with the Minerals Management Service (MMS) of the

Department of the Interior, they ensure annual inspections are completed on the oil & gas platforms within the Study Area. Civilian crew boats and helicopters are used to transport USCG and MMS personnel to and from the platforms in order to perform their missions.

The USCGC George Cobb is 175 foot buoy tender used for servicing aids to navigation throughout the area. These aids consist of mooring buoys for USCG patrol boats operating in the area and are located at Smugglers Cove at Santa Cruz Island, Coho Anchorage at Point Conception, and San Simeon. The George Cobb is also used to maintain harbor approach and channel buoys for the Santa Barbara, Ventura, Channel Islands and Port Hueneme harbors. Other navigational and rock/reef warning buoys are maintained up the coast to San Simeon. NOAA also has four large weather buoys in the area that are maintained by George Cobb.

The USCG Aids to Navigation Team maintains aids to navigation light structures including Anacapa Island Light, Gull Island Light (off south coast of Santa Cruz Island), and Southpoint Light on Santa Rosa Island. Gull Island and Southpoint Lights are accessed by USCG helicopters for maintenance by land servicing crews. The Aids to Navigation Team also has a 21-foot boat for aid servicing.

Other Coast Guard units in California, such as Station Morro Bay, Sector Los Angeles/Long Beach, and Air Stations located in Los Angeles, San Diego, San Francisco and Sacramento transit and conduct training and actual search and rescue and law enforcement missions within the CINMS boundary.

In carrying out its mission, the USCG cooperates with many federal and state agencies, including but not limited to NMFS, USFWS, EPA and the CA Department of Fish and Game. The USCG also performs marine mammal monitoring activities by reporting the location of marine mammals to NMFS in the course of executing other mission activities.

3.5.11 Research and Education

3.5.11.1 Research

The CINMS is an important participant and collaborator in marine research. The Sanctuary's Sea Wolf aircraft, a former Air Force plane, is used to conduct monitoring as part of the Sanctuary Aerial Monitoring and Spatial Analysis (SAMSAP) program. The aircraft enables personnel to monitor activity and resources, survey Sanctuary users, conduct vessel traffic studies, observe the effects of shore runoff, perform aerial surveys during oil spill emergencies, and collect data on both marine mammals and the kelp forest. The aircraft can also be used for supervision and enforcement. Photography and video are used to record sightings. Special onboard equipment includes a Global Positioning System and laptop computer. Position information can be downloaded instantly to register the location of objects in sanctuary waters. Although NOAA has assigned the aircraft to both the CINMS and the Monterey Bay National Marine Sanctuary, the aircraft is primarily used within the CINMS.

The CINMS *R/V Shearwater* is the Sanctuary's new research vessel. Launched in 2003 this vessel is used primarily for research, and also serves as a host for educational field trips and emergency response in and around the Sanctuary. The *Shearwater* also includes wet and dry labs that allow on-board processing of samples and data. Extensive dive operations are supported by onboard facilities and equipment. The boat also has an A-frame and winch for oceanographic studies and observer stations for wildlife surveys. On board berthing, stowage, galley, and safety equipment allow for multi-day excursions with crews of up to ten scientists.

A summary of example research projects conducted in the Study Area follows:

- CalCOFI began publishing information on the ecology of the SCB in 1950 and continues to study the marine ecosystems of the SCB. Because of the research and data collection of CalCOFI investigators, the SCB is one of the most studied marine systems in the world.

- The Biological Resources Discipline of the USGS is conducting wide-ranging research on fishes of central and southern California.

- The Partnership for Interdisciplinary Studies of Coastal Oceans (PISCO) is a consortium of four universities (Oregon State University, University of California at Santa Cruz and Santa Barbara, and Stanford University) investigating the physical and biological processes of the nearshore region along Oregon and California coasts. Among the many projects of PISCO, one project seeks to determine how fish stocks in distant locales are connected.

- Several faculty and professional researchers at the University of California at Santa Barbara have received support from the National Science Foundation for a long-term study of the biological and physical links between marine and coastal processes of the region, such as the Long-Term Ecological Research (LTER) Program.

- Scientists from federal, state, and local government agencies, universities, and private and volunteer agencies have formed a Multi-Agency Rocky Intertidal Network to monitor important shoreline processes. This network includes 61 sites located from San Luis Obispo to San Diego Counties on the mainland and Channel Islands.

- In 1999, the Santa Barbara Museum of Natural History published a 14-volume taxonomic atlas of the benthic fauna of the Santa Maria Basin and the western Santa Barbara Channel.

- A number of investigators at the National Center for Ecological Analysis and Synthesis (NCEAS) in Santa Barbara, California, are studying the ecology of the Study Area.

- The University of California at San Diego's Scripps Institution of Oceanography continues to study coastal physical oceanography to help improve the ability to forecast changes in the coastal ocean and atmosphere.

- The National Biological Survey and CINP continue to create inventories and conduct monitoring programs on the ecology of the northern Channel Islands, such as: rocky intertidal ecological monitoring, marine debris monitoring, seabird monitoring, kelp forest monitoring, terrestrial vertebrate monitoring, water quality inventories, land bird monitoring, island fox monitoring, and terrestrial vegetation monitoring.

- The CINMS staff, in partnership with CDFG and University of California, Santa Barbara scientists have conducted research cruises within CINMS using the Delta Submersible. The purpose of the work was to collect data from sites within and outside of marine reserve areas.

- Ice Age Study focuses on research on stacked delta deposits that fringe the southern margin of the Santa Barbara Channel.

- Pfleger Institute of Environmental Research (PIER) strives to ensure healthy, sustainable oceans for our future, to develop the public's understanding and appreciation for the ocean and its life,

and to act as stewards of the marine environment. Scientists at the PIER conducted research on the movement of giant seabass in the CINMS.

- The Collaborative Marine Research Program involves commercial fishermen and their unique skills and expertise with the CINMS in the gathering of vital data on natural resources, biophysical processes, and effects of human activities in order help the Sanctuary staff make informed management decisions.

- The NOAA Environmental Services Data Directory is a forms-based tool that allows users to search for publicly available environmental data held by public and private sources throughout the world.

Other research and data collection supported by the CINMS include participation in annual ocean and coastal conferences and meetings, and assistance in biological surveys, including a current baseline population study on Xantus's murrelets.

Biological Monitoring Programs

A characterization of existing monitoring programs in the CINMS is depicted in *Summary of Research Programs in the Channel Islands National Marine Sanctuary (*Abeles *et al.* 2003). These monitoring programs are developed by various federal, state, and local organizations including the CDFG, NOAA's Southwest Fisheries Science Center, CINP, the University of California at Santa Barbara's Marine Science Institute, and a number of other scientific organizations. In addition, a list of study organisms and techniques is provided in the summary of monitoring programs.

A variety of economically and ecologically important species are studied, such as sea urchin, abalone, sea bass, rockfish, seabird, pinniped, and humpback and blue whale populations. Several programs monitor marine communities, defined simply as a group of different species that occupy a particular habitat. Research programs have been established to monitor communities on sandy beaches and lagoons, rocky intertidal habitats, kelp forests, subtidal rocky reefs, soft bottom habitats, and in the open ocean. Research programs that monitor community dynamics generally include surveys of common species that occur in a particular habitat. Research on the environment includes mapping physical habitats, measuring variables such as water temperature, salinity, and oxygen content, tracking ocean currents and winds, and remote sensing. Several research programs attempt to monitor ecosystem dynamics, including both physical and biological variables. Recent efforts within the CINMS have emphasized seabird research, archeological/cultural research (primarily shipwrecks), and collecting baseline data for emerging management issues.

Channel Islands National Park

There are also a number of research and monitoring activities at the CINP. For example, the USGS - Biological Resources Discipline/NPS Cooperative Research Activities are involved in monitoring and research activities. A list of related publications and technical reports from the NPS for the northern Channel Islands is available online at http://www.nps.gov/chis/rm/HTMLPages/References.htm. The Channel Islands Field Station has cooperative agreements with CINP and the University of California at Santa Barbara that facilitate collaboration between field station scientists and university and Park biologists. The linkage with the university also provides opportunities to supervise graduate students in marine ecology and work in laboratories with flow-through seawater to allow housing temperate marine species. CINP provides access to the habitats of several rare and endemic plant species suffering from the impacts of exotic weeds and feral animals. The CINP also has a wealth of marine resources in need of

study and management. Field station biologists analyze data collected from the CINP and assist with its extensive resource monitoring program.

Scientists at the Channel Islands Field Station conduct research on the ecology and conservation biology of sensitive plants and animals at the Channel Islands and along California's coast. In doing so, the field station supports information needs of the NPS, USFWS, and other state and federal clients such as the Department of Defense, Sanctuary, and CDFG. Some examples of ongoing research in plant ecology include rare plant demography, effects of grazing by feral animals on native plant communities, restoration ecology, and the distribution of exotic weeds. Examples of research in marine ecology are restoration strategies for the nearly extirpated white abalone, patterns of disturbance for threatened western snowy plovers, Marine Reserve design, and kelp forest community dynamics.

CINP Marine Monitoring Program Reports are available online, including on the kelp forest monitoring program, seabird monitoring, rocky intertidal monitoring, and sandy beach monitoring (http://www.nature.nps.gov/im/units/chis/HTMLpages/AnnlReports/MarineReports.htm).

3.5.11.2 Education

The CINMS provides a variety of outreach and education programs for teachers, students, resource users, and the general public. Sanctuary 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, school programs) and (2) product development (printed materials, website development, audio visual materials, signs, displays, and exhibits) as critical education and outreach tools.

While addressing site-specific education and outreach needs, the CINMS Education Program 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 13 National Marine Sanctuary sites.

Additional information on coastal and marine education programs in the region can be found at the *Marine and Coastal Educational Resources Directory*, which is available online at http://www.coastal.ca.gov/publiced/directory/resdirectory/rdindex.html.

Interpretative programs aim to enhance public awareness and understanding of the significance of the CINMS and the need to protect its resources. The management objectives designed to meet this goal are:

- Enhance public access to relevant information on the CINMS, its goals, and resources;
- Improve opportunities for a wider public access to the CINMS and first-hand appreciation of significant CINMS resources;
- Broaden public support for the CINMS and CINMS management by offering on-site and off-site programs suited to visitors of diverse interests, ages, and skills;
- Provide for public involvement by encouraging feedback on the effectiveness of interpretive programs, collaboration with CINMS management staff in extension/outreach programs, and participation in other volunteer programs; and

- Collaborate with other organizations to provide interpretive services complementary to the NMSP.

Educational activities that CINMS staff have developed include:

- Interpretive exhibits, signage, and displays;
- Publications including newsletters (*Alolkoy*), brochures, posters, and an educational resource directory;
- A cooperative agreement with the Santa Barbara Maritime Museum;
- Cooperative development of the Santa Barbara Outdoor Visitors Center with the NPS and the CDFG;
- Sustainable Seas Expedition Educational Curriculum;
- Education programs and curriculum for teachers and students;
- Public programs, lectures and events; and
- Internship and volunteer programs.

A sample of classroom materials and online educational activities that incorporate real data from research activities associated with the CINMS follows:

- *Shipwreck Database* is a online database that includes information on shipwrecks from each of the five West Coast National Marine Sanctuaries.
- *Marine Mammal Sightings Database* reports marine mammal sightings in the Santa Barbara Channel.
- *Nautical Charts* introduces students to marine navigation and the main components of a nautical chart using a local chart for Channel Islands waters.
- *Monitoring a Habitat* describes how marine biologists monitor marine habitats in the CINMS.
- *Partner Educational Activities* works collaboratively with a variety of regional and national partners to develop educational activities for teachers and students.
- *JASON XIV: From Shore to Sea* explores the terrestrial and marine ecosystems that extend from California's coast to the CINMS to learn how such systems affect life on our planet.
- *Mapping an Ocean Sanctuary* includes the CINMS, the Center for Image Processing in Education, and National Geographic Society's Sustainable Seas Expeditions to help teachers bring geographic information systems (GIS) into their classrooms. The Mapping an Ocean Sanctuary curriculum and four day training workshop use Arcview software to explore maps and databases showing biological, geological, and economic features of the CINMS. Some specific topics include environmental monitoring, distribution of marine species, marine reserves, and commercial and recreational use patterns in the CINMS.

- *The Sanctuary and Center for Image Processing in Education* partnered to develop a GIS marine science curriculum and middle and high school teacher training program. GIS is a valuable visualization tool used by marine resource managers to map locations of animals and to understand ocean bathymetry, currents, sea surface temperature and more.

- *Project Oceanography* is a live television program designed for middle school science students. Each week during the school year, students can learn about a variety of ocean science topics right in their classroom.

- *Student Field Monitoring* supports the development of student and teacher participation in long-term field monitoring studies.

- *University of California at Santa Barbara Marine Science Institute Oceans to Classrooms* is a collaborative effort with CINMS and area teachers on developing kits and lesson materials for bringing ocean sciences into the classrooms. There is a floating laboratory component that includes stations for collecting water chemistry, plankton data, marine mammal sightings, and learning about marine navigation.

- *Waves on Wheels Program* supports a curriculum linked to state and local science standards and provides important outreach in Santa Barbara County.

- *Marine Reserves Digital Lab* includes an interactive marine reserves simulation of collaborative decision-making and negotiation over the establishment of marine reserves within the CINMS.

- *National Geographic Society's Sustainable Seas Expeditions* is a joint project of the National Geographic Society and NOAA efforts to explore, conduct research and develop public education programs about the National Marine Sanctuaries.

- *Project Oceanography Channel Islands Curriculum* is a collaborative effort of the CINMS and Project Oceanography (during the winter of 2002) to create three live educational television programs and educational activity packets for 6th to 8th grades highlighting research in the CINMS, intertidal monitoring, and marine reserves.

- *Channel Islands Naturalist Corps (CINC)* was established in 2001 as the Sanctuary Naturalist Corps but was expanded in 2003 through a joint effort with CINP to jointly train volunteers to interpret both Park and Sanctuary resources. CINC includes a group of volunteer ocean stewards dedicated to educating passengers on board local marine excursion vessels conducting whale watch tours, natural history tours, and island trips in the Santa Barbara Channel in the CINP and Sanctuary. Members provide education about the unique marine life. CINC volunteers collect valuable research on marine mammals and other important resources. Over 90 community volunteers, representing students, working professionals, and the retired, participate in the program. They attend a 5-week training class on Sanctuary programs and the physical, biological, and geological aspects of the CINMS and CINP. CINC volunteers represent the Sanctuary and the NPS on over 600 whale watch trips, attend numerous local outreach events, and educate over 100,000 local residents, tourists, and school children annually.

- *Dive trips* sponsored by the CINMS are geared toward non-consumptive use of the resources, and focus on the following activities: (1) underwater photography workshops with local experts on board to provide hands-on instruction, (2) fish survey trips during the month of July for the Great Annual Fish Count, and (3) year round fish surveys.

- *Diver Uplink Cruises* are special cruises for non-divers that offer a diver-conducted video tour of the kelp forests and underwater reefs using state-of-the-art equipment for full two-way interaction between observers and the dive team.

- Each year the CINMS partners with other organizations to coordinate and host several *Teacher Workshops*. These workshops are single-day to multi-day professional development opportunities. During these workshops, teachers learn the importance and value of the CINMS and learn strategies for integrating 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 also conducts teacher workshops at local, regional, and national professional conferences each year.

- *Mountains to the Sea Watershed Curriculum* includes a partnership between the CINMS and Santa Barbara County's Project Clean Water in the development of a comprehensive watershed education program for 4th through 8th grade that introduces both teachers and students to the local watersheds of the region. The curriculum, in-class presentations, field trips, and resources cover a variety of topics including the water cycle, runoff, and the connection between our local creeks and the ocean. A variety of handouts, posters, and experiments are also included.

- *The Santa Barbara Maritime Museum* is located in the Waterfront Center in the Santa Barbara Harbor. The Museum preserves and presents to the public the maritime history of California's Central Coast, while providing an ongoing educational platform to study and record human interaction with the marine environment. The CINMS and the Museum are developing five interactive exhibits featuring the shipwrecks at the Channel Islands. Sanctuary staff also participate in ongoing lecture series at the Museum.

- *Cabrillo High School Aquarium* is located on the campus of Cabrillo High School in the Lompoc Unified School District. High school students are active participants in the daily maintenance, operation, and outreach programs of the aquarium. The CINMS partners with the aquarium on exhibits, including a weather kiosk display and other educational programs.

- *Santa Barbara Museum of Natural History Sea Center*, located on Stearns Wharf in Santa Barbara, California, reopened in 2005 after extensive renovations. The Sea Center contains a hands-on immersion laboratory that highlights the work of scientists who explore, monitor, and discover ways to preserve our oceans. The CINMS is collaborating with the Sea Center on educational exhibits and programs.

- *Parks as Classrooms* is the education program of the NPS in partnership with the National Park Foundation. It encompasses many different kinds of experiential education programs. Each year Park rangers at CINP share the Park resources with over 10,000 students in classrooms and nearly again that many at the Park visitor center. In-class programs cover a variety of natural and cultural history topics for grades 2 through 5 in local schools. Programs at the visitor center meet the needs of classes from preschool through university level. All programs are tied to the curriculum students are studying.

- *Channel Islands National Park Visitor Center* has several marine and Channel Islands related educational displays including a rocky tidepool, elephant seal exhibit, and pygmy mammoth exhibit. There is also a theatre, bookstore, and Channel Islands Information Center.

- *Discovering The Channel Islands National Marine Sanctuary* is an adult education course administered by Sanctuary staff and offered alternately by Ventura College Community Services

and Santa Barbara City College. The course allows students to explore the diverse kelp forests, rocky reefs, and sandy bottom communities of the CINMS. This course includes weekly evening lectures and an optional field trip to the Channel Islands.

- Aboard the *McArthur*, the *Sanctuary Quest Expedition* team conducted research, exploration, and monitoring within and adjacent to the CINMS. Over the long term, the expedition may help to provide a framework for understanding more about the efficacy and role of the sanctuary system in protecting and conserving marine resources, and to provide the impetus for continued regional research.

- *Coastal Watersheds Education Program* is run by several agencies and non-profit organizations and supported by the Sanctuary. It includes web-based and classroom activities that integrate and interpret current research program data sets, teacher research and monitoring training programs, and involving students in local volunteer monitoring projects.

- *South Coast Watershed Research Center* is a newly opened learning and resource center to enhance public awareness of the Santa Barbara watershed system located at Arroyo Burro Beach. The Sanctuary provides the center with exhibits that tie coastal processes to offshore systems.

- *Channel Islands Harbor Boating Instruction and Safety Center* is supported by the Sanctuary. The Sanctuary helps design exhibits and other literature for this center.

- *Caltrans Adopt-a-Highway Program* is a program that includes removing litter, planting and establishing trees or wildflowers, removing graffiti, and controlling vegetation along the California's State Highway System. The Sanctuary participates to prevent pollutants from entering California's waterways.

- *California Coastal Commission Coastal Cleanup Day* is an annual, one-day event during which volunteers gather at designated beaches to collect and remove trash and debris from beaches. Sanctuary staff serve as site leaders and coordinate volunteer efforts.

4.0 ENVIRONMENTAL CONSEQUENCES OF ALTERNATIVES

This section evaluates the environmental consequences of proposed changes to existing CINMS regulations. The environmental impacts of the Proposed Action, Alternative 1, and No-Action Alternative are evaluated in FEIS sections 4.1, 4.2, and 4.3, respectively. A total of 13 proposed regulatory updates or changes are discussed under the Proposed Action within this EIS; a total of 14 proposed regulatory updates or changes are discussed under Alternative 1. Also discussed below are changes to the description of the sanctuary boundary, Department of Defense exemption and requirements language, and CINMS permit procedures and issuance criteria.

This section incorporates some revisions to the Proposed Action, and associated updated information, that resulted from comments received on the Proposed Rule and DEIS. This section also contains updates to the impact analyses of the Proposed Action based on the revised proposed discharge regulation as addressed in the Supplemental DEIS, which was issued in March 2008.

Current conditions presented in FEIS section 3.0 and conditions under the No-Action Alternative provide a baseline for analysis of the Proposed Action and Alternative 1. Impacts are classified in the following categories:

- Significant adverse impact;
- Significant adverse impact but mitigable to less than significant;
- Less than significant adverse impact;
- No impact; and
- Beneficial impact.

NEPA requires consideration of environmental impacts of major federal actions significantly affecting the quality of the human environment (42 U.S.C. 4332 (c)). To determine whether an impact is significant, CEQ regulations require the consideration of context and intensity of potential impacts (40 CFR 1508.27). Context normally refers to the setting, *e.g.*, local or regional, and intensity refers to the severity of the impact. Impacts can either be direct or indirect, and short-term or long-term. Direct impacts are those caused by implementing the proposed activities that occur at the same time and place as the proposed activities. Indirect impacts are those caused by implementing the proposed activities, but the impacts occur later in time or are farther removed in distance from those activities.

Types of impacts include ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), esthetic, historic, cultural, economic, social, and health impacts (40 CFR 1508.8). Applicable impacts considered herein include: physical (water quality) and biological (living marine resources) ecological impacts, along with esthetic (water clarity), historic (shipwrecks and submerged artifacts), and socioeconomic (economic and other effects on Sanctuary users) impacts. For purposes of this FEIS, the applicable impacts are organized into two categories: 1) impacts on physical, biological, esthetic, and cultural/historical resources; and 2) socioeconomic impacts.

Table 4.0-1 summarizes the environmental impacts associated with the Proposed Action. Text supporting these conclusions is presented below, and mitigation measures are listed for all significant impacts. Mitigation is the reduction or elimination of the severity of an impact. The intention of mitigation is to reduce the effects of an action on the environment.

NEPA, or related requirements, requires additional evaluation of the project's impacts with regards to:

- Significant unavoidable adverse impacts;
- The relationship between short-term uses and long-term productivity;
- Any irreversible or irretrievable commitment of resources (*e.g.*, renewable resources such as wetlands or wildlife habitat);
- Environmental justice; and
- Growth-inducing impacts.

An EIS must describe any significant unavoidable impacts for which either no mitigation or only partial mitigation is feasible. NEPA requires that an EIS also consider the relationship between short-term uses of the environment and the maintenance and enhancement of long-term productivity. Finally, NEPA requires that an EIS analyze the extent to which the proposed project's effects would involve irreversible or irretrievable commitment of renewable resources (*e.g.*, wetlands, wildlife habitat). A discussion of each of these impacts is discussed in section 4.4 below.

The socioeconomic impacts of the proposed project are discussed for each of the proposed regulatory changes, and then summarized in section 4.5 below. Evaluating and comparing the potential socioeconomic impacts of each alternative involves assessing how implementing the proposed prohibitions would directly and indirectly affect user groups and/or industries, as well as the local economy. In conjunction with evaluating and comparing impacts on the physical, biological, and historical environments, this socioeconomic assessment is an important step in the process of selecting a preferred alternative.

CEQ regulations implementing NEPA also require that the cumulative impacts of a proposed action be assessed (40 CFR parts 1500-1508). A cumulative impact is an "impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions" (40 CFR 1508.7). Cumulative impacts can result from individually minor but collectively significant actions taking place over time. CEQ's guidance for considering cumulative effects states that NEPA documents "should compare the cumulative effects of multiple actions with appropriate national, regional, state, or community goals to determine whether the total effect is significant." Cumulative impacts are discussed in section 4.6 below.

This FEIS analyzes regulatory changes, not the action plans proposed in the FMP (Vol. 1). The FMP action plans describe non-regulatory management strategies and actions that Sanctuary staff would use to address various issues identified during the management plan review process. Nested within each action plan is a series of strategies, each of which contains detailed actions Sanctuary staff would take over the next five years in order to meet CINMS goals and objectives. These strategies comprise activities ranging from program planning, budgeting, administrative services, mapping, vessel and aircraft operations, to basic and applied research and monitoring activities, education and outreach services, and advisory body activities. NOAA has determined that the proposed actions within the FMP (Vol. I) individually and cumulatively are administrative in nature and have no potential for significant impact on the environment. Thus, the FMP's planned activities are not analyzed within this FEIS.

Table 4.0-1. Summary of Impacts Under the Proposed Action (page 1 of 3)

Legend - No impact < Less than significant adverse impact > Significant adverse impact + Beneficial impact Note: Proposed regulatory changes are summarized	Physical Environment	Biological Environment	Cultural/Historical Resources	Human Use										
				Oil & Gas	Tele-communications	Minerals Mining	Vessels & Harbors	Commercial Fishing	Recreation & Tourism (consumptive and non-consumptive)	Marine Salvage Businesses	Motorized Personal Watercraft	Aviation	Research & Education	Department of Defense
Prohibition 1 (modification): Exploring for, Developing, or Producing Hydrocarbons														
Remove outdated and unnecessary oil spill contingency equipment requirements for offshore oil industry operations at leased areas partially within the Sanctuary	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Prohibition 2 (new): Exploring for, Developing, or Producing Minerals	+	+	+	-	-	<	-	+	+	-	-	-	+	-
Prohibition 3 (modifications): Discharge or Deposit														
Specify that the existing exception for discharging or depositing fish, fish parts, or chumming materials (bait) applies only to lawful fishing activity within the Sanctuary	-	+	-	-	-	-	-	-	<	-	-	-	<	-
Remove an exception for discharging or depositing meals on board vessels	-	+	-	-	-	-	<	<	<	<	-	-	<	-
Clarify that discharges allowed from marine sanitation devices apply only to Type I and Type II marine sanitation devices	+	+	-	-	-	-	<	<	<	<	-	-	<	-
Provide an exception for graywater discharge from vessels less than 300 GRT, and from oceangoing ships 300 GRT or more without the capacity to hold graywater while within the CINMS	+	+	-	-	-	-	<	+	+	-	-	-	-	-

Legend - No impact < Less than significant adverse impact > Significant adverse impact + Beneficial impact Note: Proposed regulatory changes are summarized	Physical Environment	Biological Environment	Cultural/Historical Resources	Human Use										
				Oil & Gas	Tele-communications	Minerals Mining	Vessels & Harbors	Commercial Fishing	Recreation & Tourism (consumptive and non-consumptive)	Marine Salvage Businesses	Motorized Personal Watercraft	Aviation	Research & Education	Department of Defense
Prohibit treated sewage discharge (MSD Type I or II) from cruise ships, and from oceangoing ships without the capacity to hold sewage while within the CINMS	+	+	-	-	-	-	<	+	+	-	-	-	-	-
Prohibit discharges and deposits of any material or other matter from beyond the boundary of the Sanctuary that subsequently enters the Sanctuary and injures a Sanctuary resource or quality	+	+	-	-	-	-	-	-	-	-	-	-	-	-
Prohibition 4 (modification): Altering the Seabed														
Extend from 2 nmi to 6 nmi from Islands the existing prohibition on alteration of the submerged lands of the Sanctuary	+	+	+	-	<	<	-	+	+	-	-	-	+	-
Prohibition 5 (new): Abandoning any structure, material or other matter on or in the submerged lands of the Sanctuary	+	+	+	-	-	-	<	+	+	+	-	-	+	-
Prohibition 6 (modification): Nearshore Operation of Vessels														
Prohibit vessels of 300 gross registered tons or more (excluding fishing and kelp harvesting vessels) from approaching within 1 nmi of the Islands	+	+	+	-	-	-	-	+	<	-	-	-	<	-
Prohibition 7 (modification): Disturbing a Seabird or Marine Mammal by Aircraft Overflight – minor wording changes	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Legend - No impact < Less than significant adverse impact > Significant adverse impact + Beneficial impact Note: Proposed regulatory changes are summarized	Physical Environment	Biological Environment	Cultural/Historical Resources	Human Use										
				Oil & Gas	Tele-communications	Minerals Mining	Vessels & Harbors	Commercial Fishing	Recreation & Tourism (consumptive and non-consumptive)	Marine Salvage Businesses	Motorized Personal Watercraft	Aviation	Research & Education	Department of Defense
Prohibition 8 (modification): Moving, Removing, or Injuring a Historical Resource														
Revise and strengthen to prohibit "moving, possessing, injuring or attempting to move, remove, or injure any Sanctuary historical resource"	-	-	+	-	-	-	-	-	+	-	-	-	+	-
Prohibition 9 (new): Taking a Marine Mammal, Sea Turtle, or Seabird except as authorized under the Marine Mammal Protection Act, the Endangered Species Act, or the Migratory Bird Treaty Act	-	+	-	-	-	-	-	<	+	-	-	-	+	-
Prohibition 10 (new): Possessing Marine Mammals, Sea Turtles, or Seabirds except as authorized under the Marine Mammal Protection Act, the Endangered Species Act, or the Migratory Bird Treaty Act	-	+	-	-	-	-	-	<	+	-	-	-	+	-
Prohibition 11 (new): Tampering with Sanctuary Signs and Markers	+	+	+	-	-	-	-	-	-	-	-	-	-	-
Prohibition 12 (new): Releasing an Introduced Species within or into the Sanctuary	+	+	+	-	-	-	-	+	+	-	-	-	+	-
Prohibition 13 (new): Operation of Motorized Personal Watercraft within Channel Islands National Park	+	+	-	-	-	-	-	-	-	-	-	-	-	-
Sanctuary Boundary Description Clarifications	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Exemptions and Requirements for Department of Defense Activities (modifications)	<	<	<	-	-	-	-	<	<	-	-	-	<	-
Permit Procedures and Issuance Criteria (modifications)	-	-	-	-	-	-	-	-	-	-	-	-	-	-

4.1 PROPOSED ACTION

4.1.1 Prohibition 1 (Oil and Gas)

Proposed revisions to Prohibition 1 regarding oil and gas activities (15 CFR 922.71(a)(1)) would yield a regulation nearly identical to the existing regulation except that outdated language related to cleanup equipment requirements for potential oil spills would be deleted.

Effects on Physical, Biological and Historical Resources

Because the proposed revision to Prohibition 1 would not result in any physical effects on the environment, there would be no impacts on the physical or biological environment, or on historical resources within the Sanctuary.

Socioeconomic Effects

The proposed revisions to Prohibition 1 would not create any new requirements for the oil and gas industry, but rather would simply eliminate from the regulation the outdated and unnecessary spill response equipment requirements. Oil and gas operations would, however, continue to be required to adhere to current standards and follow current procedures for cleanup of oil spills as stipulated in the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and other federal, state and local regulations, although this would not be stipulated by the Sanctuary's regulations. Therefore, implementation of revised Prohibition 1 would have no impact on offshore oil and gas operations. In addition, no other human uses would be affected by revisions to Prohibition 1.

4.1.2 Prohibition 2 (Mineral Activities)

Effects on Physical, Biological and Historical Resources

Implementation of Prohibition 2, a prohibition of exploration, development, or production of minerals in the Sanctuary, would protect the physical environment within the Sanctuary from potential negative effects on the seabed and water quality due to mineral activities, and therefore would have a direct long-term beneficial impact on the physical environment. Mineral extraction activities could involve scraping the Sanctuary's seabed surface and/or excavation of pits and tunnels into the seabed. In addition to the physical impacts on the seabed structure, mineral activities could decrease water quality through the discharge of drill cuttings and mud. Discharge of drill cuttings and mud could also increase turbidity that could cause interference with the filtering, feeding, or respiratory functions of marine organisms. Drill cuttings and mud often have elevated concentrations of metals that can be toxic to marine life (*e.g.*, arsenic, mercury). Other potential impacts could include: destruction and direct smothering of the benthic biota; potential harm to fisheries; loss of food sources and habitat for some species; possible lowered photosynthesis and oxygen levels; and degraded appearance of the water itself. Implementation of Prohibition 2 would therefore result in added protection of biological resources such as invertebrates and fishes that utilize benthic habitats and rely on high water quality in the Sanctuary. Implementation of Prohibition 2 also would protect against noise levels associated with mining that have the potential to disturb seabirds, marine mammals or other organisms. Therefore, Prohibition 2 would result in a direct long-term beneficial impact to biological resources in the Sanctuary. Finally, prohibition of mineral activities within the Sanctuary would reduce the risk of potential disturbance to underwater historical resources either through physical disturbance or increased turbidity, which would result in direct long-term beneficial impact to historical resources. Such protections would be consistent with the Sanctuary prohibitions on alteration of or construction on the seabed and discharge/deposit.

Socioeconomic Effects

The proposed new Prohibition 2 would affect the potential for future mineral exploration, production, and development within the Sanctuary boundary to the extent that such activities could potentially have been conducted in compliance with other existing Sanctuary regulations (*e.g.*, see Prohibitions 3 and 4). This activity has not occurred within the Sanctuary, and there is no known present or foreseeable future plan or project to conduct mineral exploration, production, or development within the Sanctuary boundary. Therefore, proposed new Prohibition 2 would have a less than significant adverse impact on this potential human use.

Because implementation of Prohibition 2 would help to protect biological and historical resources, it would have indirect long-term benefits on other human uses such as fishing, recreation, tourism, research, and education. No other human uses would be affected by implementation of Prohibition 2.

4.1.3 Prohibition 3 (Discharging or Depositing)

Prohibition 3 is proposed to remain largely the same as the existing discharge and deposit regulation, with some wording changes aimed at improving clarity of the regulation in a manner consistent with its original intent. There are, however, also some important substantive changes proposed.

- New language clarifying that discharging or depositing of fish, fish parts, or chumming materials (bait) is allowed only if it is from, and conducted during, lawful fishing activities in the Sanctuary;

- A new prohibition on discharging or depositing food waste from vessels;

- A new prohibition on discharging or depositing any material or other matter outside the Sanctuary that subsequently enters and injures a Sanctuary resource or quality;

- A clarification that the Marine Sanitation Device (MSD) discharge exception to the Sanctuary's discharge prohibition specifically applies to Type I and Type II (U.S. Coast Guard classification) MSDs, and not to Type III MSDs;

- A provision that the treated sewage discharge (MSD Type I or II) exception to the prohibition applies only to vessels less than 300 GRT and to oceangoing ships without sufficient holding tank capacity to hold sewage while within the Sanctuary; and

- An exception to the prohibition for graywater discharge from vessels less than 300 GRT, and from oceangoing ships 300 GRT or more without sufficient holding tank capacity to hold graywater while within the Sanctuary.

Impacts associated with each of these changes are discussed below. The revised regulation would continue other aspects of the current discharge and deposit regulation.

4.1.3.1 Discharging or Depositing of Fish, Fish Parts, or Chumming Materials (Bait)

The new proposed language regarding this exception would specify that the existing regulatory provision that allows for the deposit of fish, fish parts or chumming materials (bait) applies only when such matter is associated with lawful fishing activity within the Sanctuary, and discharged during the conduct of such activity. This new language would specify that discharging or depositing fish, fish parts, or chumming material (bait) for non-fishing purposes is not allowed in the CINMS.

Effects on Physical, Biological, and Historical Resources

This new language would have a beneficial impact to biological resources of the Sanctuary by preventing discharge or depositing of fish, fish parts, or chumming material (bait) from activities other than fishing, such as dumping of waste fish product, and from fishing that did not occur in the Sanctuary. Such dumping of fish, fish parts, or chumming material could promote negative biological effects associated with fish feeding (*e.g.*, providing unnatural food sources to marine life, altering community structure, and changing species behavior) and could lead to conflicts among uses (*e.g.*, dumping of chum to attract sharks in close proximity to surfers or SCUBA divers). This new language would have no impact on the physical or historical resource environment.

Socioeconomic Effects

This new language would continue to have no impact on lawful fishing in the CINMS because it is complementary to fishing activities. This new language would have less than significant adverse impacts on recreational and research use in the CINMS, as chumming practices for purposes other than fishing (*e.g.*, to attract marine life for research, photography or other recreational purposes) is not known to occur within the Sanctuary. Other uses of the Sanctuary would not be affected by this regulatory change.

4.1.3.2 Discharging or Depositing of Food Waste from Vessels

Addition of human food waste into the Sanctuary provides an artificial source of food and nutrients to fish and other species and can be disruptive to the nutrient cycle and food chain dynamics of the natural ecosystem. Artificial feeding may encourage the growth of fish and invertebrate populations that tolerate and often thrive on artificial food sources, and that sometimes can outcompete other species, thereby reducing overall species diversity in localized areas (Alevizon 2000).

Some commercial and recreational vessels that operate within the Sanctuary currently dispose of their food waste (or meals on board vessels) by dumping it into the ocean. However, vessels are currently restricted from discharging or depositing food waste within 3 nmi of land and from discharging or depositing food wastes unless ground to less than one inch within 3 to 12 nmi of land by regulations implementing MARPOL (33 CFR part 151 *et seq*. and see sections 3.5.3.1, and 5.2 for more details). A proposed revised prohibition (Prohibition 3) would require that all vessels either dispose of their food waste as solid waste upon arrival at ports and harbors or properly discharge/deposit their food waste into the ocean beyond the Sanctuary's 6 nmi boundary. Therefore, Prohibition 3 would have the effect of extending an absolute prohibition on discharge/deposit of food waste to the Sanctuary area between 3 and 6 nmi from the Islands.

Effects on Physical, Biological and Historical Resources

Implementation of Prohibition 3 would have a long-term beneficial impact to biological resources within the Sanctuary by protecting the natural ecosystem from such disruption (the impacts of which are discussed above at 4.1.3.2). The physical environment and historical resources would not be affected by this regulation change.

Socioeconomic Effects

Potential effects on vessel-based commercial or recreational activities would be highest during multi-day trips to the islands or within the Sanctuary. Alternate disposal options for food waste, other than within the Sanctuary, are feasible and affordable. No health standards or hazards would be expected to be violated from retaining food waste on board until appropriate discharge/deposit outside the Sanctuary is

possible or upon returning to port. Therefore, less than significant adverse impacts to vessel-based commercial, recreational, and research user groups would occur with implementation of revised Prohibition 3. Implementation of Prohibition 3 also would have indirect long-term benefits on other resource-dependent human uses such as fishing, recreation, tourism, research, and education by preventing disruptions to the nutrient cycle and food chain dynamics of the natural ecosystem.

4.1.3.3 Marine Sanitation Device Discharge/Deposit Exception Clarification

The proposed changes concerning the existing exception for vessel sewage discharge/deposit (biodegradable effluent) from a marine sanitation device provide greater clarity and specificity on the original intent of the regulation. Although the existing regulation requires that vessel wastes be "generated by marine sanitation devices" and this is meant to prohibit the discharge/deposit of untreated sewage into the Sanctuary, the proposed new language provides greater clarity with regard to this by specifying that such discharges/deposits are allowed only if generated by Type I or II marine sanitation devices. Type I and II marine sanitation devices treat wastes, while a Type III marine sanitation device does not.

Effects on Physical, Biological, and Historical Resources

This proposed change would produce a direct long-term beneficial impact to biological resources and the physical environment (water quality) of the Sanctuary, because, in being more clear, it would provide a more effective deterrent to illegal discharges/deposits of sewage into the Sanctuary, thus providing greater protection to these resources and qualities. Historical resources would receive no impact from this proposed regulatory change.

Socioeconomic Effects

The proposed modification to the Sanctuary's discharge/deposit regulation clarifying that discharges/deposits allowed from marine sanitation devices apply only to Type I and Type II marine sanitation devices is applicable to all vessels operating in Sanctuary waters, but would not actually introduce any new restrictions. This change would clarify the original intent of the Sanctuary's discharge/deposit regulation, which is that raw sewage may not be discharged/deposited from vessels into the Sanctuary, but rather it must first be treated by a marine sanitation device. There is no quantitative data available on the extent of raw sewage discharge/deposit occurring from vessels into Sanctuary waters, but anecdotal information and direct observations of this practice by Sanctuary staff confirm that it does take place.

To the extent that this clarification might affect the customary, though illegal, sewage discharge/deposit practices of some vessel operators not using Type I or Type II marine sanitation devices, the effect on those activities is expected to be less than significant. The basis for this determination is that such discharges/deposits may still legally occur outside the Sanctuary's 6 nmi boundary and vessel sewage may be pumped out and disposed of at mainland ports and harbors. With less than significant impacts, Sanctuary boaters that do not have a Type I or II MSD, and/or do not wish to install such a system, can comply with this regulation through proper trip planning. This includes making sure waste holding tanks are properly and fully pumped out before embarking on a trip to the Sanctuary, using shoreside restrooms prior to departure, allocating time for any necessary waste handling trips that may need to take place beyond the Sanctuary's boundary, and allocating time for trips ashore to use designated CINP public toilets. Boaters can also increase their vessel's sewage holding capacity by upgrading equipment or adding additional storage capacity (*e.g.*, marine portable toilets). Using enzyme-based products, and good plumbing, can help control sewage odor, which can help reduce the desire to dump untreated sewage

while within CINMS. Boaters can also more easily comply with this regulation by keeping their vessel's marine toilet working properly, including following suggested maintenance guidelines.

Commercial fishing, recreational and tourism use, and research and educational use may receive indirect benefits from this regulatory clarification, especially as it might pertain to preventing large volume discharges from larger vessels, since it may contribute to sustaining favorable environmental quality in their areas of operation.

4.1.3.4 Discharging or Depositing Sewage from Large Vessels

This revised regulation would amend the exception to the prohibition on discharging or depositing sewage from within or into the Sanctuary by providing that the exception would apply not only to sewage effluent treated by an operable Type I or II marine sanitation device, but also only to that from small vessels (less than 300 GRT), and from oceangoing ships without sufficient holding tank capacity to hold sewage while within the Sanctuary. The effect would be to prohibit both untreated and treated sewage discharge (MSD Type I or II) from cruise ships and from oceangoing ships with sufficient holding tank capacity to hold sewage while within the Sanctuary.

The proposed regulatory definition for "oceangoing ship" is a private, commercial, government, or military vessel of 300 gross registered tons or more, not including cruise ships. The proposed regulatory definition for "cruise ship" is a vessel with 250 or more passenger berths for hire.

Effects on Physical, Biological and Historical Resources

Overall, this revised prohibition would have a direct long-term beneficial impact on physical (*e.g.*, water quality), biological, and esthetic resources because it would prohibit cruise ships and most oceangoing ships from discharging sewage (treated and untreated) in the Sanctuary.

As described in FEIS section 3.0, vessel sewage discharge is more concentrated than domestic land-based sewage, may introduce disease-causing microorganisms (pathogens), such as bacteria, protozoans, and viruses, into the marine environment (EPA 2007), and may contain high concentrations of nutrients that can lead to eutrophication (the process that can cause oxygen-depleted "dead zones" in aquatic environments). Such sewage discharges, in large volume, could also introduce an unpleasant esthetic impact to the Sanctuary (diminishing Sanctuary resources and its ecological, conservation, esthetic, recreational and other qualities). Although large vessels may have type II marine sanitation devices (MSDs) designed to treat sewage (by reducing fecal coliform bacteria and total suspended solids), studies in Alaska of cruise ship waste water discharges have shown high rates of failure in the ability of conventional MSDs to meet legal discharge standards (Alaska Department of Environmental Conservation 2004). Cruise ships can produce and discharge sewage wastes on par with small cities, yet they are not subject to the same strict environmental regulations and monitoring requirements that land based facilities are required to comply with, such as obtaining discharge permits, meeting numerous permit conditions, and monitoring discharges (NOAA 2003c). This revised regulation would prohibit sewage discharges from large vessels, thereby yielding a beneficial impact to the Sanctuary's physical, biological and esthetic resources.

Prohibiting large volumes of sewage (treated and untreated) from being discharged in the Sanctuary would avoid potential negative impacts on the Sanctuary's esthetic qualities, which could affect Sanctuary users (*e.g.*, paddle sports, and commercial and recreational boating, fishing, and diving).

Treated sewage discharge from small vessels, and from oceangoing ships without sufficient holding tank capacity to hold sewage while within the Sanctuary, is anticipated to have a less than significant adverse impact on the Sanctuary's physical, biological, and esthetic resources. Given that most oceangoing ships have sufficient holding tank capacity to hold sewage while within the Sanctuary, and given the much lower number of people on oceangoing ships (as noted in FEIS section 3.0, on average oceangoing ships carry crews of approximately twenty people, but may range from five to fifty people), the treated sewage generated by qualifying ships is far less in quantity as compared to that from cruise ships, and is not expected to contain the larger volume of possible harmful nutrients, pathogens, and chemicals that can be found in cruise ship treated sewage.

NOAA does not anticipate any measurable impacts on historical resources to result from this revised prohibition. Any potential impacts on historical resources would likely be indirect and beneficial (stemming from benefits to water quality), but less than significant.

Socioeconomic Effects

NOAA expects less than significant adverse impacts to operators of large vessels to result from this prohibition because: 1) the presence of cruise ships inside CINMS is not common; 2) the presence of oceangoing ships inside CINMS is limited to the brief duration that these vessels pass through the section of the vessel traffic separation scheme (TSS) that partially overlaps the eastern edge of the Sanctuary); 3) MARPOL and domestic law prohibit these vessels from discharging untreated sewage in state waters (from 0 to 3 nmi from shore); 4) moving beyond the outer Sanctuary boundary before discharging is not expected to be infeasible for these large vessels, nor is it expected to yield additional costs; and 5) oceangoing ships without sufficient holding tank capacity to hold sewage while within the Sanctuary would be excepted from the prohibition. Because large vessels are typically in the Sanctuary only as a function of transiting through the TSS, they would already be spending the fuel and time necessary to get across the Sanctuary and would simply be required to hold their sewage until they are outside the Sanctuary boundary. Although it is NOAA's understanding that there are a few oceangoing ships (not cruise ships) that may not have sufficient holding tank capacity to hold sewage while within the Sanctuary, an exception to this prohibition is provided (consistent with the California Clean Coast Act), thus minimizing any possible socioeconomic impact. This regulation would have no adverse impact on other human uses of the CINMS.

In addition, prohibiting large volumes of sewage (treated and untreated) from being discharged in the Sanctuary may have beneficial esthetic impacts on certain Sanctuary users. For example, boating, paddle sports, fishing, and diving would benefit from not encountering large volume sewage wastewater plumes in the Sanctuary. Furthermore, Sanctuary users who encounter such a sewage wastewater plume may decide to relocate for their activities, thereby demonstrating displacement effects.

4.1.3.5 Discharging or Depositing of Graywater from Large Vessels

This modification to the discharge and deposit regulation would provide a limited exception for graywater discharge, applicable only to small vessels (less than 300 GRT), and oceangoing ships without sufficient holding tank capacity to hold graywater[14] while within the Sanctuary. The effect would be to prohibit graywater discharge from oceangoing ships with sufficient holding tank capacity to hold graywater while in the Sanctuary, and all other vessels 300 GRT or more (*e.g.*, cruise ships). The proposed regulatory definition for "graywater" would be "galley, bath, or shower water."

[14] Many oceangoing ships are designed without the ability to retain graywater, and, as such, must discharge graywater directly as it is produced.

Effects on Physical, Biological and Historical Resources

Graywater can contain a variety of substances including (but not limited to) detergents, oil and grease, pesticides, and food wastes (Eley 2000). Although little research has been done on the impacts of graywater on the marine environment, many of the chemicals that have been found in graywater are known to be toxic (Casanova *et al*. 2001). Unlike sewage effluents, graywater effluents are not subject to federal standards for bacteria and other pollutants; however, graywater sampling of cruise ships in Alaska prior to the implementation of Alaska state graywater discharge standards indicated that sampled graywater was similar to sewage in terms of bacteria and total suspended solids (Alaska Department of Environmental Conservation 2001). Graywater is by far the largest source of liquid waste on a cruise ship (Sweeting and Wayne 2003). Additional background on graywater is provided in FEIS section 3.5.3.2.

By reducing the potential for introducing pollutants (as mentioned above) into the Sanctuary, prohibiting graywater discharges from large vessels is expected to have a beneficial impact on physical and biological resources. Prohibiting such graywater discharges is anticipated to have a less than significant impact (none to no measurable impact) on historical resources.

To the extent that large vessel graywater discharges could be visible, such discharges could also have a potential adverse impact on Sanctuary esthetic qualities. Therefore, the prohibition of large vessel graywater discharges may have a beneficial effect on esthetic qualities of the Sanctuary.

Graywater discharge from small vessels, and from oceangoing ships without sufficient holding tank capacity to hold graywater while within the Sanctuary, is anticipated to have a less than significant adverse impact on the Sanctuary's physical, biological, and esthetic resources. Due to the much lower number of people on oceangoing ships (as noted in section 3.5.3.1, on average oceangoing ships carry crews of approximately 20 people, but may range from five to fifty people), graywater from these vessels is far less in quantity as compared to that from cruise ships, and is not expected to contain the larger volume of possible harmful chemicals that can be found in cruise ship graywater (NOAA 2003c). Providing an exception for such graywater discharges is anticipated to have a less than significant impact (none to no measurable impact) on historical resources.

Socioeconomic Effects

NOAA expects less than significant adverse socioeconomic impacts to result from the prohibition on graywater discharges from large vessels because: 1) the presence of cruise ships inside CINMS is not common; 2) the presence of oceangoing ships inside CINMS is limited to the brief duration that these vessels pass through the section of the vessel traffic separation scheme (TSS) that partially overlaps the eastern edge of the Sanctuary); 3) cruise ships and oceangoing ships with sufficient holding tank capacity are already prohibited from discharging graywater in waters of the state, which make up about 43% of the distance across the southeast-bound TSS lane; 4) moving beyond the outer Sanctuary boundary before discharging is not expected to be infeasible for large vessels, nor is it expected to yield additional costs (large vessels are typically in the Sanctuary only as a function of transiting through the TSS, so they would already be spending the fuel and time necessary to get across the Sanctuary and would simply be required to hold their graywater until they are outside the Sanctuary boundary); and 5) oceangoing ships without sufficient holding tank capacity to hold graywater while within the Sanctuary would be excepted from the prohibition. Given that cruise ships travel at between 15 to 20 knots, cruise ships should only be in Sanctuary waters for approximately one hour when using the northwest-bound TSS lane, and approximately two to two-and-a-half hours when using the southeast-bound lane. Cruise ships typically have sufficient storage capacity for graywater to allow vessel operations for between one to two days, although there is significant variation among vessels (Pruitt 2004). The average container ship that

travels at 25 knots would spend less than one hour in Sanctuary waters when using the northwest-bound lane, and approximately one-and-a-half hours when using the southeast-bound lane. The TSS is described in detail in FEIS section 3.5.3.1.

In addition, prohibiting large volumes of graywater from being discharged in the Sanctuary may have beneficial esthetic impacts on certain Sanctuary users. For example, boating, paddle sports, fishing, and diving would benefit from not encountering large volume graywater discharges in the Sanctuary.

The prohibition on graywater discharge from large vessels would have no adverse socioeconomic impact on other human uses of the CINMS.

Because the revised prohibition on graywater discharge would not apply to small vessels, and oceangoing ships without sufficient holding tank capacity to hold graywater while within the Sanctuary, there would be no adverse socioeconomic affect on these vessel operators.

4.1.3.6 Discharge or Deposit from beyond the Sanctuary

Currently, accidental or intentional discharge/deposit from beyond the Sanctuary boundary of oil, hazardous substances, or other matter from vessels, offshore facilities, or possibly mainland-based sources has the potential to enter and injure a Sanctuary resource or quality. This revision to Prohibition 3 would prohibit the discharge or deposit of any material or other matter that enters the Sanctuary and injures Sanctuary resources or qualities, including oil, hazardous substances, or any other matter.

The NMSA defines "injure" as "to change adversely, either in the short or long-term, a chemical, biological or physical attribute of, or the viability of. This includes, but is not limited to, to cause the loss of or destroy" (15 CFR 922.3). "Sanctuary resource" is defined at 15 CFR 922.3 as "any living or non-living resource of a National Marine Sanctuary that contributes to the conservation, recreational, ecological, historical, research, educational, or aesthetic value of the Sanctuary, including, but not limited to, the substratum of the area of the Sanctuary, other submerged features and the surrounding seabed, carbonate rock, corals and other bottom formations, coralline algae and other marine plants and algae, marine invertebrates, brine-seep biota, phytoplankton, zooplankton, fish, seabirds, sea turtles and other marine reptiles, marine mammals and historical resources." "Sanctuary quality" is defined at 15 CFR 922.3 as "any of those ambient conditions, physical-chemical characteristics and natural processes, the maintenance of which is essential to the ecological health of the Sanctuary, including, but not limited to, water quality, sediment quality and air quality."

Adverse environmental effects may result from incidents originating outside CINMS, such as oil spills, that could introduce harmful substances into the Sanctuary that subsequently cause the injury of Sanctuary resources or qualities. Such incidents would need to be reviewed on a case-by-case basis in order to determine if a Sanctuary resource has been injured by a discharged/deposited substance, and to verify the source of that discharge/deposit.

Types of discharge/deposit that would be excepted from this proposed prohibition are the same as those excepted from the CINMS prohibition on discharges/deposits *within* the Sanctuary. These exceptions are:

- Fish, fish parts, or chumming materials (bait) used in or resulting from lawful fishing activity within the Sanctuary, provided that such discharge or deposit is during the conduct of lawful fishing activity within the Sanctuary;

- Biodegradable effluent incidental to vessel use and generated by an operable Type I or II marine sanitation device (U.S. Coast Guard classification) approved in accordance with section 312 of

the Federal Water Pollution Control Act, as amended, (FWPCA), 33 U.S.C. 1321 *et seq*., from a vessel less than 300 gross registered tons and from an oceangoing ship without sufficient holding tank capacity to hold sewage while within the Sanctuary. Vessel operators must lock all marine sanitation devices in a manner that prevents discharge of untreated sewage;

- Biodegradable matter from vessel deck wash down, vessel engine cooling water, graywater from a vessel less than 300 gross registered tons, and graywater from an oceangoing ship without sufficient holding tank capacity to hold graywater while within the Sanctuary;

- Vessel engine or generator exhaust;

- Effluents routinely and necessarily discharged or deposited incidental to hydrocarbon exploration, development or production allowed by CINMS regulations; and

- Discharges allowed under section 312(n) of the FWPCA for military vessels.

With this regulation, the activities that result in discharges or deposit outside the Sanctuary would not be directly regulated by the NMSP, but parties responsible for injuries to sanctuary resources or qualities resulting from such activities would be subject to penalty under the NMSA.

Discharge of oil or hazardous substances into the environment is regulated under CERCLA and the FWPCA (as amended by OPA). Under CERCLA, the FWPCA, and section 312 of the NMSA, natural resource trustees, such as NOAA, may seek to recover damages caused by injury to natural resources within the Sanctuary due to direct or indirect discharges of oil and hazardous substances into the Sanctuary. The discharge of fill and dredged material is also regulated under the FWPCA. Implementation of the proposed revised Prohibition 3 would prohibit via regulation subject to civil penalties the discharge or depositing of any matter that causes injury to Sanctuary resources or qualities.

Adding this prohibition to the CINMS regulations would not only provide greater protection for Sanctuary resources and qualities, but would also increase the level of regulatory consistency among national marine sanctuaries. This same prohibition is found in the regulations for several other sanctuaries designated more recently than CINMS. These sites include the Monterey Bay National Marine Sanctuary, Flower Garden Banks National Marine Sanctuary, Stellwagen Bank National Marine Sanctuary, Olympic Coast National Marine Sanctuary, and Florida Keys National Marine Sanctuary.

Effects on Physical, Biological, and Historical Resources

Prohibition 3 would have a direct long-term beneficial impact on biological resources and the physical environment (water quality), because it would act as an additional deterrent of illegal discharge/deposit and subsequent injury to Sanctuary resources or qualities and would also address additional discharges/deposits if they cause injury. This regulation would not affect historical resources.

Socioeconomic Effects

This proposed regulation would except appropriate discharges/deposits likely to come from vessels, namely: fish, fish parts or chumming materials (bait) used in or resulting from lawful fishing activity; biodegradable effluent incidental to vessel use and generated by an operable Type I or II marine sanitation device (U.S. Coast Guard classification) approved in accordance with section 312 of the Federal Water Pollution Control Act (33 U.S.C. 1321 *et seq*.) from a vessel less than 300 gross registered tons and from an oceangoing ship without sufficient holding tank capacity to hold sewage while within the Sanctuary; biodegradable matter resulting from vessel deck wash down, vessel engine cooling water, graywater from

a vessel less than 300 gross registered tons, and graywater from an oceangoing ship without sufficient holding tank capacity to hold graywater while within the Sanctuary; and vessel engine or generator exhaust. Other discharges/deposits would only be illegal under this regulation if it could be proved they both entered the Sanctuary and injured Sanctuary resources or qualities. As such, this regulation would have a less than significant adverse impact on vessels, commercial fishing, recreation and tourism, marine salvage, and research and educational human uses adjacent to the CINMS.

4.1.4 Prohibition 4 (Altering the Seabed)

The proposed revised Prohibition 4, which addresses alteration of the seabed, would be similar to the existing regulation except (1) it would expand seabed protection beyond 2 nmi off the Islands out to the full extent of the 6 nmi CINMS boundary and (2) it would replace the term "seabed" with "submerged lands" to attain consistency with the NMSA. There is no present activity or known foreseeable future plan or project to alter the submerged lands within the CINMS boundary from 2 to 6 nmi offshore, other than oil and gas industry activities already excepted from Sanctuary regulations (see Prohibition 1). Certain activities with the potential to impact the submerged lands of the Sanctuary could be allowed pursuant to a CINMS permit as authorized under the existing regulation (*e.g.*, modification of CINP piers, appropriate research projects, etc.). Exceptions to this regulation would remain unchanged with one exception, and consist of the following:

- Anchoring a vessel;
- Installing an authorized navigational aid;
- Conducting lawful fishing activity;
- Laying pipeline pursuant to exploring for, developing or producing hydrocarbons; and
- Exploring for, developing or producing hydrocarbons as allowed by Prohibition 1.

The third exception is proposed to be changed from "bottom trawling from a commercial fishing vessel" because not just bottom trawling but also other types of lawful fishing, *e.g.*, pot and trap fishing, could alter the submerged lands.

Effects on Physical, Biological, and Historical Resources

Implementation of Prohibition 4 would protect the physical environment within the CINMS from potential negative effects of alterations on the seabed, island reefs, and water quality, and would therefore have a long-term beneficial impact on the physical environment. In addition to the physical impacts on the seabed or reef structure, some activities that alter submerged lands can decrease water quality by increasing turbidity. Therefore, implementation of Prohibition 4 also would result in protection of biological resources such as invertebrates and fishes in the CINMS that utilize the seabed or reef as substrate and rely on high water quality. This would result in a long-term beneficial impact to biological resources. Finally, prohibiting alteration of submerged lands within the CINMS would reduce the risk of potential disturbance to underwater historical resources either through physical disturbance or increased turbidity, thereby having a long-term beneficial impact on historical resources.

Socioeconomic Effects

Because implementation of Prohibition 4 would result in a beneficial impact on physical, biological, and historical resources, it would also provide indirect long-term benefits to resource-dependent human uses

such as fishing, recreation, tourism, research, and education. Protection of the seabed would protect benthic habitats that play an important role in the ecosystem, which in turn may provide indirect benefits to ecosystem dependent human uses such as those listed above. This prohibition would not negatively impact lawful commercial and recreational fishing activities since lawful fishing activity is excepted from this prohibition.

Prohibition 4 would have a less than significant adverse impact on potential human uses that may involve alteration of submerged lands within the Sanctuary, as no such activities are not known to be proposed for installation or development within the Sanctuary at this time or in the foreseeable future. Other existing human uses, which do not normally involve, depend upon, or result in alteration of the submerged lands of the Sanctuary, would not be adversely affected by this regulation. Marine salvage operators when engaged in vessel salvage recovery operations would not be adversely affected by this proposed regulation because the operator may apply for a salvage permit. For those entities that do occasionally need to temporarily place materials on the submerged lands of the Sanctuary, such as research entities, the Sanctuary permitting process could be used to potentially allow acceptable activities.

4.1.5 Prohibition 5 (Abandoning)

The proposed new Prohibition 5 would prohibit abandoning any structure, material, or other matter on or in the submerged lands of the CINMS.

Effects on Physical, Biological and Historical Resources

This new regulation would protect against abandonment of shipwrecks or other debris. Implementation of Prohibition 5 would protect the physical environment within the CINMS from potential negative effects on the seabed, reefs, and water quality due to abandonment of destructive or potentially polluted matter. It would, therefore, have direct long-term beneficial impact on the physical environment. In addition to the physical impacts on the seabed, abandonment of structures or other matter increases solid waste within the CINMS and could decrease water quality due to leaching of hazardous materials, depending upon the nature of the debris, and increase physical damage and stress on habitats due to smothering and abrasion. Therefore, implementation of Prohibition 5 also would result in protection of biological resources such as invertebrates and fishes in the CINMS that use benthic habitats and/or rely on high water quality. In addition, prohibiting abandonment of matter within the CINMS would reduce the risk of potential disturbance to underwater historical resources through physical disturbance, and would therefore result in a direct long-term beneficial impact to historical resources.

Socioeconomic Effects

The NMSP knows of no present activity or foreseeable future plan or project that would result in the expected abandonment of a structure or any other matter within the CINMS boundary. Therefore, Prohibition 5 would have a less than significant adverse impact on human uses within the Sanctuary that require abandonment of structures or other matter.

Protection of the natural habitats within the Sanctuary, free from abandoned wreckage or other debris, can enhance conditions for recreational and commercial users of the Sanctuary, such as those engaged in diving or lawful fishing (especially bottom fishing and trawling operations) or for those engaged in research of and education about natural marine environments. As such, fishing, recreation and tourism, research and education would experience an indirect long-term beneficial impact from this proposed regulation. In addition, marine salvage businesses engaged in removing wrecked vessels, thus assisting boaters with compliance with Sanctuary regulations, would experience a beneficial impact from this

proposed regulation. Other Sanctuary users are expected to experience no impact from this proposed regulation.

4.1.6 Prohibition 6 (Nearshore Operation of Vessels)

Revised Prohibition 6 would expand the Sanctuary's existing vessel regulation, which prohibits cargo carrying vessels and vessels engaged in the trade of servicing offshore installation from within 1 nmi of Island shores, by proposing to also apply this prohibition to vessels of 300 gross registered tons or more. This proposed revision prohibits large vessels from coming within close proximity of an Island. An accident involving a large vessel has the potential to cause much greater damage to reefs or other nearshore Sanctuary habitats than an accident involving a smaller vessel. In addition, louder and lower frequency noise levels often are associated with larger vessels and may disturb marine mammals and seabirds on or near the Islands.

Existing exceptions to the vessel operation prohibition would remain in effect, and are the following:

- Transporting persons or supplies to or from an Island;
- Fishing vessels and kelp harvesting vessels.

Effects on Physical, Biological, and Historical Resources

This revised regulation would provide additional protection against grounding accidents of large vessels on the Islands and collisions and potential noise impacts on marine mammals and seabirds. Implementation of Prohibition 6 would protect the physical environment within the CINMS from potential negative effects of accidents on nearshore habitats, and would have a direct long-term beneficial impact on the physical environment. Therefore, implementation of Prohibition 6 also would result in protection of biological resources such as invertebrates and fishes in the CINMS that use the seabed or reef as habitat, seabirds that use Island cliffs and shores, and marine mammals that use beaches, and thus would have a direct long-term beneficial impact on the biological environment. Finally, the proposed additional protection against grounding accidents with large vessels would reduce the risk of potential disturbance to underwater historical resources through physical disturbance and would thus have a direct long-term beneficial impact on historical resources.

Socioeconomic Effects

Currently, no known commercial passenger or recreational vessels over 300 gross registered tons approach within 1 nmi of the Islands within CINMS. Many cruise ships are larger than 300 gross registered tons, and would be reached by this prohibition, but cruise ships have not been seen within the nearshore waters of the Sanctuary for more than ten years and the NMSP is not aware of any routes close to the Channel Islands planned by the cruise line industry. In addition, access inside of 1 nmi from the Islands would be allowed for smaller craft that may be stowed on large vessels located beyond 1 nmi (such as Zodiaks or skiffs). Therefore, this regulation would have no impact on current recreational or tourism use but could have less than significant negative affects on potential future uses of the CINMS by some large vessels.

It is unlikely that a marine salvage vessel would ever be large enough to be affected by this prohibition, and in any case the operators of such vessels could apply for a permit. Fishing and kelp-harvesting vessels would remain excepted, as they are under the current regulation. For these reasons, there is no impact expected for the above mentioned uses. However, research vessels of the >300 gross registered ton size class needing to transit within 1 nmi of the Islands (an uncommon--less than once per year--but

anticipated occurrence) would need to apply for and receive a permit from CINMS, the adverse impact of which is expected to be less than significant.

According to the *Port of Long Beach Master Plan* (POA of Long Beach 2003), the Port Authority plans to expand capacity of the harbor, which will increase both the number and size of vessels that use the Santa Barbara Channel (see FEIS section 3.5.3.1 for more details). It is reasonable to expect that travel by vessels greater than 300 gross registered tons within the CINMS is a foreseeable future activity, although that activity is expected to remain within the Santa Barbara Channel's vessel traffic separation scheme that passes through the eastern portion of CINMS (and is beyond 1 nmi from Island shores) or transit well outside the Channel Islands. As such, Prohibition 6 would have no negative impact on use of the CINMS by large vessel traffic (shipping activity) and associated ports and harbors.

Because implementation of Prohibition 6 would benefit biological and historical resources, it would also have an indirect long-term beneficial impact to other human uses such as fishing, recreation, tourism, research, and education. These uses may benefit from a nearshore marine environment that is not subjected to large-scale vessel groundings, hazardous spills, and/or wildlife disturbance risks that very large vessels can pose. No other existing human uses would be affected by implementation of Prohibition 6.

4.1.7 Prohibition 7 (Disturbing a Seabird or Marine Mammal by Aircraft Overflight)

Revised Prohibition 7—prohibiting disturbance of marine mammals and seabirds from aircraft overflights below 1000 feet within 1 nmi of Island shores–would remain essentially identical to the existing regulation except for minor wording changes (see Table 2.1-1) which emphasize that exceptions to this regulation do not override the obligation to comply with proposed Prohibition 9 (taking a marine mammal, seabird or sea turtle).

Effects on Physical, Biological and Historical Resources

The proposed wording changes to this existing regulation would result in no adverse impact on the physical, biological, or historical environment.

Socioeconomic Effects

The proposed wording changes to this existing regulation would result in no adverse impact on any of the human uses within the Sanctuary.

4.1.8 Prohibition 8 (Moving, Removing, or Injuring a Sanctuary Historical Resource)

The Sanctuary's existing historical resource protection regulation prohibits "removing or damaging any historical or cultural resource." Revised Prohibition 8 would be very similar to the existing regulation except for: (1) minor wording changes that have no effect on the environment or on human uses; and (2) expanding the range of prohibited actions to include "moving," "injuring" (deleting "damaging") or "possessing," and "attempting to move, remove, injure, or possess" a Sanctuary historical resource.

Effects on Physical, Biological, and Historical Resources

By increasing the specificity of prohibited actions, and adding possession and attempts, this revised regulation would become more enforceable and otherwise provide additional protection to Sanctuary historical resources. Revised Prohibition 8, therefore, would have a direct long-term beneficial impact on CINMS historical resources. Added enforceability would serve as an additional deterrent to illegal

activities with historical resources in the CINMS. This revised regulation would not affect the physical or biological environment within the CINMS.

Socioeconomic Effects

Because removing or damaging a historical resource is prohibited within the Sanctuary, this revised regulation would have no adverse impact on human uses of the CINMS. The added enforceability of this revised prohibition would have an indirect long-term beneficial impact on human uses such as recreation, tourism, research, and education by helping to preserve these resources and leaving them intact for their heritage, educational, and scientific values as well as enjoyment by the general public.

4.1.9 Prohibition 9 (Taking a Marine Mammal, Sea Turtle, or Seabird)

Prohibition 9 is a proposed new Sanctuary regulation that would prohibit the take of any marine mammal, sea turtle, or seabird within or above the Sanctuary except as authorized by the MMPA, ESA, or MBTA. This revised regulation would provide additional protection to marine mammals, sea turtles, and seabirds beyond what is currently afforded.

Per the NMSA regulations, "take or "taking" is defined as follows: (1) for any marine mammal, sea turtle, or seabird listed as either endangered or threatened pursuant to the ESA, to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect or injure, or to attempt to engage in any such conduct; (2) for any other marine mammal, sea turtle, or seabird, to harass, hunt, capture, kill, collect or injure, or to attempt to engage in any such conduct. For the purposes of both (1) and (2) of this definition, this includes, but is not limited to, collecting any dead or injured marine mammal, sea turtle, or seabird, or any part thereof; restraining or detaining any marine mammal, sea turtle, or seabird, or any part thereof, no matter how temporarily; tagging any sea turtle, marine mammal, or seabird; operating a vessel or aircraft or any other act that results in the disturbance or molestation of any marine mammal, sea turtle, or seabird (15 CFR 922.3).

This proposed new regulation would not apply if an activity that might cause take of marine mammals, seabirds, or sea turtles has already been authorized under the MMPA, ESA, or MBTA (*e.g.*, federal- or state-approved fisheries with authorization under those acts). This new regulation would bring a special focus to protection of the diverse and abundant marine mammal and seabird populations of the Sanctuary as well as the occasional sea turtles present within the CINMS. This regulation, with its focus on protecting populations within the CINMS, is complementary to the jurisdiction and efforts of other resource protection agencies (*i.e.*, NMFS, USFWS, CDFG), as these other authorities must spread limited resources over much wider geographic areas than the CINMS. In addition, this proposed regulation would provide a greater deterrent per the civil penalties in the NMSA, thus assisting in increasing compliance with laws that provide protection to marine mammals, seabirds and sea turtles. This same regulation has been in place at national marine sanctuaries established at Monterey Bay, Stellwagen Bank, Olympic Coast, and the Florida Keys.

Additional exceptions to this proposed Sanctuary "take" prohibition would allow for activities to occur that are:

- Necessary to respond to an emergency threatening life, property, or the environment;
- Necessary for valid law enforcement activities;
- Exempted Department of Defense activities (see Table 2.1-1).

With this proposed regulation, if NMFS or the USFWS issues a permit for the take of a marine mammal, seabird, or sea turtle, it would not be regulated by the NMSP and therefore would not require a permit from the Sanctuary unless the activity would also violate another Sanctuary regulation.

Effects on Physical, Biological and Historical Resources

This new regulation would have a direct long-term beneficial impact on biological resources. This regulation would not affect the physical or historical environment within the CINMS.

Socioeconomic Effects

Because take of most of these species is generally already illegal except when authorized by the MMPA, ESA, or MBTA, this regulation would have a less than significant adverse impact on human uses of the CINMS. Because the Sanctuary would not need to authorize take under a CINMS permit for activities permitted pursuant to the MMPA, ESA, or MBTA, this regulation would not impact the permit processes of other agencies (*e.g.*, USFWS, NMFS, CDFG, etc.). In addition, commercial fishing or certain research activities which may involve the occasional take of these species may lawfully operate as such under authorizations granted pursuant to the MMPA, ESA, or MBTA. Further strengthening the prohibition of unpermitted, illegal activities that cause take of these species would have an indirect long-term beneficial impact on human uses such as recreation, tourism, research, and education. For example, the added protection of marine mammals, seabirds, and sea turtles can complement business activities focused on whale watching, kayaking, or other marine excursion tours within the Sanctuary.

4.1.10 Prohibition 10 (Possessing Marine Mammals, Sea Turtles, or Seabirds)

Related to proposed new Prohibition 9, this regulation would prohibit possessing within the Sanctuary (regardless of where taken from, moved, or removed from) any marine mammal, sea turtle, or seabird, except as authorized by the MMPA, ESA, MBTA, or any regulation, as amended, promulgated under the MMPA, ESA, or MBTA. This revised regulation would provide added protection to these species beyond what is currently afforded.

This proposed new regulation would not apply if an activity involves possession of a marine mammal, seabird, or sea turtle the take of which has already been authorized under the MMPA, ESA, or MBTA (*e.g.*, federal- or state-approved fisheries with authorization under those acts). Like proposed Prohibition 9, this new regulation would bring a special focus to protection of the diverse and abundant marine mammal and seabird populations and the sea turtles of the CINMS. This Sanctuary-focused regulation providing protection to these important species is complementary to the jurisdiction and efforts of other resource protection agencies (*i.e.*, NMFS, USFWS, CDFG), as these other authorities must spread limited resources over much wider geographic areas than the CINMS. In addition, this proposed regulation would provide a greater deterrent per the civil penalties in the NMSA, thus assisting in increasing compliance with laws that provide protection to marine mammals, seabirds and sea turtles. A similar prohibition has been in place at national marine sanctuaries established at Monterey Bay, Stellwagen Bank, Olympic Coast, and the Florida Keys.

Exceptions to this proposed Sanctuary "possession" prohibition would allow for activities to occur:

- In accordance with the scope, purpose, terms and conditions of a National Marine Sanctuary permit issued pursuant to 15 CFR 922.48 and 922.74;

- If necessary to respond to an emergency threatening life or the environment;

- If necessary for valid law enforcement purposes in the Sanctuary.

With this proposed regulation, if NMFS or the USFWS issues a permit for the possession of a marine mammal, seabird, or sea turtle, it would not be regulated by the NMSP and therefore would not require a permit from the Sanctuary unless the activity would also violate another Sanctuary regulation.

Effects on Physical, Biological and Historical Resources

Like Prohibition 9, this proposed regulation would have a direct long-term beneficial impact on biological resources. This revised regulation would not affect the physical environment or historical resources within the CINMS.

Socioeconomic Effects

Because take of these resources is generally already illegal except when authorized by the MMPA, ESA, or MBTA, this regulation would have a less than significant adverse impact on human uses of the CINMS. Because the Sanctuary would not need to authorize possession under a CINMS permit for activities permitted pursuant to the MMPA, ESA, or MBTA, this regulation would not impact the permit processes of other agencies (*e.g.*, USFWS, NMFS, CDFG). As under Prohibition 9, further strengthening the prohibition of unpermitted, illegal activities involving possession of these species would have an indirect long-term beneficial effect on human uses such as recreation, tourism, research, and education.

4.1.11 Prohibition 11 (Tampering with Signs)

Prohibition 11 is a new Sanctuary regulation that would prohibit tampering with signs, notices, placards, monuments, stakes, posts, or boundary markers within the CINMS. This proposed regulation is consistent with regulations adopted for some other national marine sanctuaries. Addition of this regulation would serve as an additional deterrent to violation of the NMSA and its regulations.

Effects on Physical, Biological, and Historical Resources

This revised regulation would help to enhance protection and enjoyment of the Sanctuary's physical environment, biological, and historical resources—in addition to what is currently afforded—by making it illegal to tamper with CINMS signs, monuments, and other markers that are necessary to adequately manage all of the resources and uses within the Sanctuary. As such, this proposed regulation would have an indirect long-term beneficial effect on these resources.

Socioeconomic Effects

Existing human uses of the Sanctuary and its facilities neither involve nor are likely to result in damage to Sanctuary signs. As such, this regulation would have no impact on human uses of the CINMS.

4.1.12 Prohibition 12 (Introducing or otherwise releasing an Introduced Species)

Prohibition 12, a proposed new regulation, would prohibit introducing or otherwise releasing from within or into the Sanctuary an introduced species, except striped bass (*Morone saxatilis*) released during catch and release fishing activity. "Introduced species" is defined to mean: (1) species (including but not limited to any of its biological matter capable of propagation) that are non-native to the ecosystem(s) 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. In general, introduced species in the marine environment can threaten the diversity and/or

abundance of native marine species, may hamper the ecosystem's ability to support itself, and therefore can adversely impact recreational and commercial activities. This proposed prohibition would help to prevent injury to Sanctuary resources, to protect the biodiversity of the CINMS ecosystems, and to preserve the native functional aspects of the ecosystems.

Introduced species could be introduced and become established in the CINMS from, for example, the release of live bait into the ocean, exchange of ballast water containing introduced species, or if introduced species attach themselves to vessels and subsequently are released within the Sanctuary or release offspring or viable reproductive material into the Sanctuary. For example, DeRivera *et al.* (2005) identified 16 non-native sessile invertebrates in the Channel Islands region that were originally introduced elsewhere on the west coast through vectors including shipping (hull-fouling), fisheries (accidental introduction via oysters), and ballast water. Release of live bait to the ocean within 3 nmi is regulated strictly by the California Fish and Game Commission and CDFG. Implementation of Prohibition 12 would provide an added deterrent and support enforcement of state regulations already in place to prevent release of introduced species to the marine environment, and would extend these protections from the state waters portion of the Sanctuary (0-3 nmi) to the outer boundary at approximately 6 nmi from Island shores.

The exception for striped bass released during catch and release fishing activity is not anticipated to have an effect on physical, biological and historical resources. Striped bass were introduced to California in 1897 and are managed by the state under the Striped Bass Management Conservation Plan, which considers potential effects of striped bass on other species. (Leet *et al.* 2001)

This proposed regulation would help prevent unintentional releases and intentional releases of introduced species. This proposed regulation is based on a comparable prohibition in place at the Florida Keys National Marine Sanctuary. The Sanctuary staff would keep watch for and be prepared to act on introduced species sightings or elevated risks within or near the Sanctuary (see the Resource Protection Action Plan in the Final Management Plan, Vol. I.).

Effects on Physical, Biological, and Historical Resources

Implementation of Prohibition 12 would provide added protection to the marine ecosystems from the threat of introduced species release, consistent with Executive Order 13112 and other applicable federal and state laws (see also FEIS section 5.7). A discussion of the numerous types of adverse impacts that introduced species can have on native coastal marine species is presented at FEIS section 3.5.5. Therefore, Prohibition 12 would have a direct long-term beneficial impact on Sanctuary resources and qualities.

Socioeconomic Effects

The release of introduced species is not part of the expected business or operational practices associated with any of current human uses of the Sanctuary. Furthermore, projects involving use or release of introduced species are not currently proposed within the CINMS, and none are anticipated within the foreseeable future. Therefore, a less than significant adverse impact on foreseeable future human uses of the CINMS would be expected by implementation of Prohibition 12. Implementation of Prohibition 12 is not expected to affect current fishing or boating within the CINMS and as such there would be no adverse impact to these current human uses. This proposed prohibition acknowledges that striped bass are the focus of an established state-managed sport fishery and since they consequently may be caught within the Sanctuary an exception is proposed for striped bass released during catch and release fishing

activity. The proposed prohibition would therefore have no impact on the striped bass sport fishery, and supporting businesses, in California.

Prohibition 12 would also have a direct long-term beneficial impact on resource-dependent human uses of the Sanctuary (fishing, recreation, tourism, research, and education) by helping to protect and maintain its native resources and qualities.

4.1.13 Prohibition 13 (Operation of Motorized Personal Watercraft)

Prohibition 13 is a proposed new regulation that would prohibit operation of motorized personal watercraft (MPWCs) within waters of the Channel Islands National Park, established by 16 U.S.C. 410(ff). Operation of MPWCs within waters of the CINP is already is prohibited by the National Park Service (NPS) (36 CFR 3.9(a)), due to potential resource impacts, conflicts with other visitors' uses and enjoyment, and safety concerns (65 FR 15077).

For purposes of this proposed new regulation, the definition of "motorized personal watercraft" is the same as that provided by the NPS. The NPS definition at 36 CFR 1.4(a) is "a vessel, usually less than 16 feet in length, which uses an inboard, internal combustion engine powering a water jet pump as its primary source of propulsion. The vessel is intended to be operated by a person or persons sitting, standing or kneeling on the vessel, rather than within the confines of the hull. The length is measured from end to end over the deck excluding sheer, meaning a straight line measurement of the overall length from the foremost part of the vessel to the aftermost part of the vessel, measured parallel to the centerline. Bow sprits, bumpkins, rudders, outboard motor brackets, and similar fittings or attachments, are not included in the measurement. Length is stated in feet and inches."

In combination with the existing NPS ban, this proposed CINMS regulation would provide added deterrence for purposes of ensuring protection of wildlife and habitats within the Sanctuary and Park.

MPWCs operate in a manner unique among recreational vehicles and pose a threat to wildlife. Their shallow draft enables them to penetrate areas not available to conventional motorized watercraft (NPS 2000, MOCZM 2002). The high speed and maneuverability of MPWCs, along with the tendency to operate them near the shore and in a repeated fashion within a confined area, results in recurring disturbance to animals and habitats (Rodgers and Smith 1997, Snow 1989). Studies have shown that the use of MPWCs in nearshore areas can increase flushing rates, reduce nesting success of certain bird species, impact spawning fish, and reduce fishing success (Burger 1998, Snow 1989). The NPS (2000, 2004) identified several of these impacts along with interruption of normal activity, avoidance and displacement, loss of habitat use, interference with movement, direct mortality, interference with courtship, alteration of behavior, change in community structure, elevated noise levels, and damage to aquatic vegetation. Further, offshore marine mammals or surfacing birds may be unaware of the presence of these vehicles due to their low frequency sound; when the inability to detect the vehicles is combined with their high speed and rapid and unpredictable movements, both animals and operators are at risk (Snow 1989).

NOAA is not aware of any MPWC impact studies conducted in the Channel Islands, which is not surprising given that the NPS has banned the use of MPWC in the CINP since 2000. Given this lack of site-specific data for MPWC impacts, data and observations from other locations (including the Monterey Bay National Marine Sanctuary) are relevant to CINMS, especially data on flushing of nesting birds and disturbance of marine mammals. NOAA has received written and oral reports of MPWC users disturbing sea otters, harbor seals, porpoise, dolphin and other wildlife in various areas of the Monterey Bay National Marine Sanctuary since implementation of an MPWC restriction there in 1993. Sometimes, due to high surf conditions, operators are unaware of their disturbance of wildlife.

The MPWC industry has reduced noise and emissions with 4-stroke engines, but NOAA is not aware of studies that have demonstrated the extent to which these improvements have reduced wildlife disturbance – NOAA's primary concern with regard to MPWC use within the one mile offshore zone of the islands. It is also not clear whether reductions in MPWC emissions and noise have rendered these factors insignificant. Regarding noise, NOAA is still concerned about the effects of oscillating sound caused by persistent throttling of the engine during repeated acceleration/deceleration within the surf zone, which is often necessary to avoid capsizing and rolling. Research and observations have shown that this frequent oscillating sound pattern is particularly disruptive to wildlife. While industry sponsored studies indicate that MPWCs are no louder than similar motorized vessels under analogous conditions, other studies indicate that because MPWCs travel repeatedly in the same area, continually leaving and reentering the water, they create rapid cycles of noise that disturb humans and wildlife (MOCZM 2002). Furthermore, industry improvements in noise and emissions do not address impacts associated with the high speed, maneuverability, shallow draft and nearshore operation of MPWC.

In addition to the types of impacts described above, NOAA's review of MPWCs at the Gulf of the Farallones National Marine Sanctuary also identified several other issues pertaining to MPWC:

- MPWCs have been operated in such a manner as to create a safety hazard to other nearby resource users;
- MPWCs may interfere with marine commercial users;
- MPWCs may disturb natural quiet and aesthetic appreciation; and
- MPWCs have interfered with other marine recreational uses.

Effects on Physical, Biological, and Historical Resources

As indicated above, this proposed new MPWC regulation would provide added deterrence for purposes of ensuring protection to the Sanctuary's biological resources and habitats. This would provide a direct long-term beneficial impact to these resources, and cause no impact to historical resources.

Socioeconomic Effects

Because this activity is already illegal (36 CFR 3.9(a)), this regulation would have no adverse impact on human uses of the Sanctuary. The proposed Sanctuary regulation would provide an additional deterrent to this currently illegal activity.

Further strengthening the prohibition of illegal activities within the CINMS would have an indirect long-term beneficial impact on human uses such as fishing, recreation, tourism, research, and education by helping preserve and maintain biological resources and habitats within the Sanctuary.

4.1.14 Sanctuary Boundary Description Clarification

Clarification of the legal description of the Sanctuary boundary is proposed (see FEIS section 2.1.1 and Table 2.1-1). Changes proposed would specify that the submerged lands (*i.e.*, the lands underlying the waters of the Sanctuary) are part of the CINMS boundary. There would be no practical change resulting from this revision because the Sanctuary has administered protective measures for the submerged lands since designation in 1980. The NMSP has authority to include submerged lands as part of national marine sanctuaries and this is reflected in amendments to the NMSA passed in 1984 (16 U.S.C. 1432(3)). This change would thus clarify the CINMS boundary description.

The Sanctuary's boundary description is proposed to be amended to clearly state that the shoreline boundary is the Mean High Water Line (MHWL) of Island shores. This technical change would not significantly affect the actual size of the Sanctuary.

Effects on Physical, Biological, and Historical Resources

The proposed boundary description changes would have no effect on the physical, biological, or historical environment of the Sanctuary.

Socioeconomic Effects

The proposed boundary description changes would have no adverse impact on human uses of the Sanctuary.

4.1.15 Department of Defense Activities

The revised language regarding the exemption of Department of Defense (DOD) activities (see Table 2.1-1) from Prohibitions 3 through 13 is more protective of the physical, biological, and historical environments than the original regulation, with the addition of clause (3), which requires that the DOD restore or replace any injured or destroyed Sanctuary resource or quality and mitigate damage, and clause (4), which requires that all DOD activities be carried out in a manner that avoids to the maximum extent practicable any adverse impacts on Sanctuary resources and qualities. This proposed revised regulation would continue to allow most DOD activities within the CINMS.

Effects on Physical, Biological and Historical Resources

The exemption language within this proposed revised regulation has the potential to impact the physical environment, biological environment, and historical resources by allowing the continuation of current DOD activities in the CINMS. Many of the military activities conducted today are different than those when the last management plan was developed for the CINMS (1982). The variety of military activities discussed in FEIS section 3.5.9 potentially have noise impacts (including sonic boom impacts) on Sanctuary wildlife; physical impacts on habitats in the Sanctuary that can cause the destruction or loss of plants, invertebrates, fish, or wildlife; and physical impacts on the seabed, water quality, or air quality. These impacts potentially have indirect impacts on fishing, recreation, tourism, research, and education. However, many of these DOD activities are no longer conducted within the boundary of the CINMS, or only rarely take place within the Sanctuary (see FEIS section 3.5.9). In addition, all of the military activities discussed in section 3.5.9 are required to undergo an environmental impact evaluation under the NEPA process—in addition to many permit processes. Furthermore, as explained above, DOD must restore or replace injured or destroyed Sanctuary resources or qualities. Therefore, the DOD regulation would have a less than significant adverse impact on the physical environment, biological environment, and historical resources of the Sanctuary.

Socioeconomic Effects

The exemption language within this proposed revised regulation has the potential to impact some resource-dependent uses of the Sanctuary (fishing, recreation, tourism, research and education) by allowing the continuation of pre-existing DOD activities in the CINMS. However, many of these DOD activities are no longer conducted within the boundary of the CINMS, or only rarely take place within the Sanctuary (see section 3.5.9). In addition, all of the military activities discussed in section 3.5.9 are required to undergo an environmental impact evaluation under the NEPA process—in addition to many permit processes. Therefore, the DOD regulation would have a less than significant adverse impact on

fishing, recreation, tourism, research, and educational uses of the Sanctuary. This proposed revised regulation would introduce no added adverse impact on the DOD activities because it retains exemptions for pre-existing military activities and specifies consultation and impact mitigation requirements and the like in a manner consistent with existing requirements in the NMSA. Proposed revised DOD regulation language would not affect other human uses in the Sanctuary.

4.1.16 Regulation on Permit Procedures and Issuance Criteria

The proposed revised permit regulations would add one activity category (for activities that will assist in managing the Sanctuary) to the list of activities for which a permit may be required; therefore slightly broadening the types of otherwise prohibited activities for which a permit may be granted. The revised permit regulations indicate that in addition to the information listed in 15 CFR 922.48(b), all permit applications must include information the Director of the National Marine Sanctuary Program needs to make the required findings described in 15 CFR 922.74(b) and (c). This clarifies what information the permit applicant must provide in his/her application.

The need for this type of information is already implied in the status quo permitting regulation, which tells the Director to evaluate such matters when determining whether to grant a permit. In similar fashion, the proposed revised permit regulations clarify other concepts implicit in the status quo regulation, clarify existing requirements for permit applications found in the Office of Management and Budget approved applicant guidelines (OMB Control Number 0648-0141), and further refine current requirements and procedures from general National Marine Sanctuary Program regulations (15 CFR 922.48(a) and (c)). The intent of these clarifications and refinements is to make the permit regulations easier to comply with and enforce, while maintaining the same basic requirements of the permittee.

Effects on Physical, Biological, and Historical Resources

The revised language regarding the procedures and criteria for issuing a CINMS permit for an otherwise prohibited activity strengthens the language in the current regulation, thereby providing more protection to the physical, biological, and historical environments (see FEIS section 2.1.16 and Table 2.1-1). Specifically, criteria were added that must be met to ensure protection of the resources (*e.g.*, the proposed activity must have, at most, only short-term and negligible adverse effects on Sanctuary resources and qualities). These revised permit procedures and issuance criteria would have a direct long-term beneficial impact on these resources.

In addition, it is important to note that proposed activities that would require issuance of a Sanctuary permit also undergo a case-by-case NEPA review to ensure that in addition to Sanctuary permitting criteria, NEPA standards and process, as appropriate, are adhered to for assessing and analyzing potential environmental impacts.

Socioeconomic Effects

The revised language is of the same general nature as the language in the current regulation. The revised language would have no adverse impact on human uses in the Sanctuary that require a Sanctuary permit and would be expected to cause no effect on other uses.

4.2 ALTERNATIVE 1

The regulations under Alternative 1 would be identical to those described for the Proposed Action with the exception of slightly greater resource protection for the following regulations.

4.2.1 Prohibition 3 (Discharging or Depositing)

Prohibition 3 (Discharging or Depositing) under Alternative 1 would exclude any vessel of 300 gross registered tons or more from discharging or depositing treated sewage waste within the CINMS.

Effects on Physical, Biological, and Historical Resources

Prohibition 3 under Alternative 1 would have a direct long-term beneficial impact on biological resources and the physical environment (water quality) because it would prevent large-quantity discharges/deposits of treated sewage, which could adversely affect Sanctuary resources and qualities. This regulation would not affect historical resources.

Socioeconomic Effects

Prohibition 3 under Alternative 1 would provide an additional protection to the Sanctuary's water quality by preventing large-volume discharges/deposits of treated sewage wastes (untreated discharges are already prohibited). However, less than significant adverse impacts to large vessel operators would be expected from this vessel restriction because: 1) the presence of such vessels inside CINMS is not common (with the exception of the brief duration that large ships pass through the section of the vessel traffic separation scheme that partially overlaps the eastern edge of the Sanctuary); 2) such discharges/deposits of untreated sewage are already prohibited in the state waters portion of the Sanctuary (from 0-3 nmi from shore); and 3) moving beyond the 6 nmi Sanctuary boundary before discharging is not expected to be infeasible for such large vessels but may potentially yield minimal additional costs, for example, fuel and time costs. This regulation would have no adverse impact on other human uses of the CINMS.

4.2.2 Prohibition 6 (Nearshore Operation of Vessels)

Prohibition 6 (Nearshore Operation of Vessels) under Alternative 1 would exclude any vessel of 150 gross registered tons or more from operating within 1 nmi of any Island within the CINMS. This would decrease the proposed upper vessel size limit from 300 gross tons (Proposed Action) to 150 gross tons (Alternative 1), thus potentially applying to a greater number of vessels and, as such, further reducing the number and risk of vessel groundings or collisions in sensitive nearshore areas.

As with the Proposed Action, existing exceptions to the CINMS vessel transit prohibition would remain in effect with this alternative, and include the following:

- Transporting persons or supplies to or from an Island; and
- Fishing and kelp-harvesting vessels.

Effects on Physical, Biological, and Historical Resources

Like the proposed action, this revised regulation would provide additional protection against collision and grounding accidents of large vessels on or near the Islands and potential noise impacts to marine mammals and seabirds. Implementation of this regulation would protect the physical environment within the CINMS from potential negative effects of accidents on nearshore habitats, and would have a direct long-term benefit on the physical environment. Therefore, implementation of this regulation would also result in protection of biological resources such as invertebrates and fishes in the CINMS that use the seabed or reef as habitat, seabirds that use Island cliffs and shores, and marine mammals that use beaches, and thus would have a direct long-term beneficial impact on the biological environment. Finally, the

proposed additional protection against grounding accidents with large vessels would reduce the risk of potential disturbance to underwater historical resources through physical disturbance and would thus have a direct long-term beneficial impact on historical resources.

Socioeconomic Effects

Currently, no known commercial passenger or recreational vessels over 150 gross registered tons approach within 1 nmi of the Islands within CINMS. Research vessels of that size class would be required to obtain a permit from CINMS, while fishing and kelp-harvesting vessels would remain excepted. NOAA is not aware of fishing vessels greater than 150 GRT using Sanctuary waters, including within one nmi of the Islands, nor aware of any emerging fisheries trends suggesting that vessels of this size are planning to use Sanctuary waters. Therefore, this regulation would have no impact on current human use but could affect potential future use of the CINMS by some larger vessels.

This restriction would be expected to have no impacts on human uses since there are currently no known vessels of 150 gross registered tons or greater using the CINMS waters within 1 nmi. However, this regulation would be more restrictive to future uses than the Proposed Action. This regulatory change would preclude the potential for large non-cargo vessels to use the CINMS waters within 1 nmi. This change, if implemented, would be expected to have greater future beneficial impacts on the physical environment, biological environment, historical resources, recreation, tourism, research, and education than the Proposed Action by protecting the Sanctuary from groundings of large vessels or other accidents.

4.2.3 Prohibition 15 (Lightering)

Prohibition 15 would prohibit lightering (at-sea transfer of petroleum-based products from vessel to vessel) within the CINMS.

Effects on Physical, Biological and Historical Resources

This prohibition would help protect Sanctuary resources and qualities from the adverse effects of spillage that may occur during non-emergency lightering operations. This new regulation would provide added protection to the Sanctuary's physical and biological resources by making it illegal to lighter within the CINMS. Although spills have occurred infrequently during lightering (see FEIS section 3.5.1.4), this would eliminate the potential risk of a spill during lightering in the CINMS (except under emergency lightering conditions). As such, this regulation would provide a long-term beneficial impact to the physical and biological resources of the Sanctuary. This regulation would also not affect the historical environment within the CINMS.

Socioeconomic Effects

Currently, there are no designated lightering zones within the CINMS, and no otherwise approved lightering activities have taken place within CINMS or are planned to occur. NOAA does not believe lightering is likely to become a common practice given the Sanctuary's geographic location (*i.e.*, its distance from major ports), the Area to Be Avoided that advises large vessels to avoid the majority of the Sanctuary (excluding the TSS), and given the established traffic patterns within the Sanctuary (*e.g.*, large vessels are typically transiting the Sanctuary to use the TSS). NOAA understands that the occasional practice of sharing fuel between smaller boats (also a form of lightering) may occur, and that this practice may help prevent other possible problems such as vessel groundings. Existing Sanctuary prohibitions against discharges would be applicable to spills associated with small-boat to small-boat fuel transfers.

Prohibiting lightering within the CINMS would have an indirect beneficial impact on human uses such as fishing, recreation, tourism, research, and education in the long-term by preserving and maintaining physical and biological resources within the Sanctuary. Because this activity is currently not being conducted in the CINMS unless in an emergency (which is exempt from this prohibition), this regulation would have no adverse impact on other human uses of the CINMS.

4.3 NO-ACTION ALTERNATIVE

The No-Action Alternative would not update or otherwise change any of the existing regulations for the Sanctuary. All of the existing Sanctuary regulations would remain as they are currently written. This alternative would not allow the NMSP to regulate certain activities that pose a threat to Sanctuary resources, as identified during the public and internal review processes. In addition, with the No-Action Alternative, some outdated information would remain in place for CINMS regulations (*e.g.*, technical description of the boundary, obsolete oil spill cleanup equipment requirements). Therefore, implementation of the No-Action Alternative would be expected to, at best, maintain the status quo environmental condition of the Sanctuary. It is expected, however, that over time the No-Action Alternative would result in adverse impacts to Sanctuary resources and qualities because current management issues as identified during public scoping would not be addressed by Sanctuary management.

Specific impacts resulting from the no action alternative are described below.

4.3.1 Oil and Gas Exploration, Development, and Production

If the outdated portion of the status quo oil and gas regulation remains in place (*i.e.*, the outdated cleanup equipment requirements and standards), it would render that part of the regulation meaningless because other laws and requirements now supersede the Sanctuary regulation's stated standards. While the utility of that portion of the regulation is diminished to a point of uselessness, it also would contribute to potential continued public confusion about what current spill preparedness requirements actually are. However, this outdated language by itself would not actually cause any impacts to the physical, biological or historical environment of the Sanctuary, and would not cause any adverse socioeconomic impact on users of the Sanctuary.

4.3.2 Exploring for, Developing, or Producing Minerals

If the proposed new prohibition on exploring for, developing, or producing minerals within the Sanctuary, except producing by-products incidental to authorized hydrocarbon production, were not adopted, the Sanctuary could be left vulnerable to the impacts of future mineral activities. The potential biological and physical resource impacts of such activities could include: physical impacts on the seabed structure; reductions in water quality through the discharge of drill cuttings and mud; increases in turbidity that could cause interference with the filtering, feeding, or respiratory functions of marine organisms; potential introduction of elevated concentrations of metals (*e.g.*, arsenic, mercury) that can be toxic to marine life; destruction and direct smothering of the benthic biota; loss of food sources and habitat for some species; possible lowered photosynthesis and oxygen levels; and degraded appearance of the water itself. The no action alternative could therefore potentially leave the Sanctuary open to possible significant adverse impacts to the biological and physical environment of the Sanctuary should in the future such activities be proposed and legally approved within CINMS. Similarly, adverse socioeconomic impacts could include degraded fishing conditions due to habitat and water quality impairment, as well as a potential diminishing of aesthetic qualities (*i.e.*, water quality, noise) within the Sanctuary.

4.3.3 Discharging or Depositing Material or Matter

The potential impacts of the no action alternative with regard to the discharge and deposit of material and other matter are described below for each of four issues dealt with in the proposed regulatory action: 1) use of marine sanitation devices; 2) fish, fish parts and chumming; 3) food waste from vessels; and 4) discharge or deposit from beyond the Sanctuary.

4.3.3.1 Discharging or Depositing of Fish, Fish Parts, or Chumming Materials (Bait)

Without adoption of the proposed modification to the discharge/deposit regulation specifying that the exception for discharging or depositing fish, fish parts, or chumming materials (bait) applies only to lawful fishing activities within the Sanctuary, the Sanctuary would likely experience such discharge/deposits and could see an increase in this practice if boater visitation rises along with regional population growth. As a result, the no action alternative would leave the Sanctuary open to potential adverse impacts to the biological environment known to be associated with fish feeding (*e.g.*, providing unnatural food sources to marine life, altering community structure, and changing species behavior) and could also experience adverse socioeconomic effects such as possible conflicts among uses (*e.g.*, discharge/deposit of chum to attract sharks in close proximity to surfers or SCUBA divers).

4.3.3.2 Discharging or Depositing of Food Waste from Vessels

Without adoption of the proposed modification to the discharge/deposit regulation specifying that the exception will be removed which currently allows for discharging or depositing food wastes within or into the Sanctuary, the Sanctuary would likely experience such discharge/deposits and could see an increase in this practice if boater visitation rises along with regional population growth. As a result, the no action alternative would leave the Sanctuary open to potential adverse impacts to the biological environment known to be associated with the artificial feeding of marine life, including disruptions to the nutrient cycle and food chain dynamics of the natural ecosystem, a possible increase in fish and invertebrate populations that tolerate and/or may come to thrive on artificial food sources, and a potential increase in fish and invertebrate populations that can sometimes outcompete other species, thereby reducing overall species diversity in localized areas (Alevizon 2000). Those potential biological impacts could correspond to adverse socioeconomic impacts on human activities within the Sanctuary, such as fishing, recreation, tourism, research, and education, all of which benefit from a healthy natural ecosystem left unimpaired by disruptions to the nutrient cycle and food chain dynamics that can be triggered by food wastes and the introduction of artificial food sources.

4.3.3.3 Marine Sanitation Device Discharge/Deposit Exception Clarification

Without adoption of the proposed modification to the discharge/deposit regulation exception clarifying that discharges allowed from marine sanitation devices (MSDs) apply only to Type I and Type II MSDs, the Sanctuary would likely continue to experience vessel discharges of raw sewage from some boaters who do not understand that Type III MSDs may not legally be discharged in the federal waters portion of CINMS (from 3-6 nmi). In other words, maintaining the regulation as it is currently written allows for potential continued confusion with some boaters not understanding the intent of the existing Sanctuary regulation and as a result engaging in raw sewage discharge into Sanctuary waters. The status quo no action alternative therefore continues to leave the Sanctuary exposed to risks posed by raw sewage discharge practices. Such practices could contribute to adverse effects on the physical environment (*i.e.*, degraded water quality) and biological resources (*i.e.*, cumulative pollutant effects on the health of marine life). Adverse socioeconomic impacts on certain uses of the Sanctuary could include both degraded water quality conditions for commercial and recreational fishing and aesthetic impacts affecting recreational

(*e.g.*, diving) and tourism use, especially as it might pertain to large volume sewage discharges from larger vessels.

4.3.3.4 Discharge or Deposit from beyond the Sanctuary

Without adoption of the proposed modification to the discharge/deposit regulation prohibiting discharges and deposits of any material or other matter from beyond the boundary of the Sanctuary that subsequently enter the Sanctuary and injure a Sanctuary resource or quality, the Sanctuary could experience associated adverse impacts to its biological and physical environment. In addition, without a legal deterrent the Sanctuary would be less able to influence proposed projects outside the boundary that hold strong potential to cause such discharge/deposit injuries to CINMS resources or qualities. Therefore, depending on the type of incident, the potential adverse impacts to the Sanctuary environment could include impairment of water quality from spills or other harmful discharges or harmful toxic, suffocating or entanglement effects on marine life. In addition, those types of biological and physical impacts could also adversely affect human uses of the Sanctuary, including commercial and recreational fishing, recreational activities, and research and education activities.

4.3.4 Altering the Seabed

Without adoption of the proposed modification to the existing seabed alteration regulation to extent protection from 0-2 nmi from the Islands to the entire CINMS, the Sanctuary could experience adverse impacts to its biological and physical environment within the 2-6 nmi area. The severity of such impacts would depend on the nature and location of the activity altering the submerged lands but might generally be expected to cause physical damage to benthic habitats, introduce possible impairment to localized water quality (*e.g.*, increased turbidity from drilling operations) that could in turn harm certain fish or benthic invertebrates, and possible damage submerged cultural and historic resources. Socioeconomic adverse impacts from the no action alternative could include the possible introduction of new deepwater obstructions to bottom-tending fishing gear, and the potential loss of opportunity or quality of experience associated with deepwater research of submerged cultural/historic resources.

4.3.5 Abandoning any Structure, Material, or Other Matter on or in the Submerged Lands

Without adoption of the proposed new regulation prohibiting abandoning any structure, material, or other matter on or in the submerged lands of the Sanctuary, the Sanctuary could experience adverse impacts to its biological, physical and historical resources. The severity of such impacts would depend on the nature and location of the activity leading to abandonment and the material or other matter being abandoned. For example, under the no action alternative a large shipwreck containing hazardous cargo potentially could be abandoned on the submerged lands without being subject to civil penalty (note there could still be a natural resource damages lawsuit), thus causing a range of physical impacts (destruction of benthic habitat), biological impacts (possible toxic contamination of marine life), impacts to historical resources (damage to existing submerged cultural or historical resource sites), and socioeconomic impacts (impaired fishing conditions, loss of trawling area, dangerous diving hazard, etc.).

4.3.6 Operation of Vessels within 1 nmi of Islands

Without adoption of the proposed modification to the existing vessel operation regulation to expand the scope to also prohibit any vessels of 300 gross registered tons or more (while continuing to except fishing vessels, kelp harvest vessels, and vessels transporting supplies to or from an Island) from operating within 1 nmi of Island shores, the Sanctuary could experience adverse impacts to its nearshore biological, physical and historical resources.

Large vessels (> 300 gross registered tons) not already explicitly prohibited from operating within 1 nmi of the Islands could include, for example, a cruise ship. Although cruise lines are not currently using the nearshore waters of the Sanctuary as a planned destination, such an activity could potentially occur in the future and pose similar grounding risks to Sanctuary resources. The existing regulation, prohibiting vessels carrying cargo, including, but not limited to, tankers and other bulk carriers and barges, or vessels engaged in the trade of servicing offshore installations, would not apply to cruise ships or other types of large vessels. The no action alternative would therefore leave the Sanctuary vulnerable to potential adverse impacts on the physical environment (*e.g.*, reef scarring and habitat destruction from a large vessel grounding), possible adverse impacts to the biological environment (*e.g.*, harm to marine life and seabirds from spilled hazardous substances), and corresponding possible adverse socioeconomic impacts to human uses such as fishing, recreation, tourism, research, and education that would be potentially displaced or impaired by a large-scale vessel grounding, nearshore hazardous spill, and/or associated disturbances to wildlife.

4.3.7 Disturbing a Seabird or Marine Mammal by Aircraft Overflight

Without adoption of the proposed minor modification to the existing regulation prohibiting disturbance of a seabird or marine mammal by flying a motorized aircraft at less than 1,000 feet over the waters within 1 nmi of any Island, except to engage in kelp bed surveys or to transport persons or supplies to or from an Island, there would be little or no direct additional impact on the physical, biological, historical, or socioeconomic environment of the Sanctuary. Although the no action alternative would result in this regulation lacking an important clarification emphasizing that exceptions to this regulation of course do not override the obligation to comply with proposed Prohibition 9 (taking a marine mammal, seabird, or sea turtle), the status quo regulation would continue to provide the same protection to seabirds and marine mammals as provided by the status quo regulation.

4.3.8 Moving, Removing, Possessing, or Injuring a Sanctuary Historical Resource

Without adoption of the proposed modification to the existing regulation prohibiting moving, removing, or injuring a Sanctuary historical resource, the Sanctuary's submerged cultural/historical resources would be vulnerable to acts not expressly prohibited such as "possessing," "attempting to move," or "attempting to remove" these resources. As such, the no action alternative could result in an adverse impact on historical resources, as well as an adverse socioeconomic impact on recreational users who appreciate visiting or learning about these fragile resources and researchers attempting to study and interpret these sites.

4.3.9 Taking or Possessing a Marine Mammal, Sea Turtle, or Seabird

Without adoption of the proposed new regulation prohibiting taking any marine mammal, sea turtle or seabird in or above the Sanctuary, except as authorized by the Marine Mammal Protection Act, as amended, (MMPA), 16 U.S.C. 1361 *et seq*., Endangered Species Act, as amended, (ESA), 16 U.S.C. 1531 *et seq*., Migratory Bird Treaty Act, as amended, (MBTA), 16 U.S.C. 703 *et seq*., or any regulation, as amended, promulgated under the MMPA, ESA or MBTA, these Sanctuary resources would remain protected but not to the extent possible with this Sanctuary regulation in place. The proposed regulation is intended to afford special protection for and civil penalty deterrence from take of the abundant marine mammal and seabird populations found in the CINMS, as well as special protection for sea turtles occasionally found within the Sanctuary. Thus, the no action alternative would not directly pose a serious risk of adverse impact to these species, but some adverse biological impacts could be possible if appropriate administration and enforcement of the ESA, MMPA and MBTA were not maintained within the CINMS. In addition, adverse socioeconomic impacts associated with the no action alternative would

be possible for users dependent upon continued protection of these species within the Sanctuary (*e.g.*, recreation, tourism, research and education), but only under a possible but not expected scenario of unsatisfactory administration and enforcement of the ESA, MMPA, and MBTA within CINMS.

Similarly, without adoption of the proposed new regulation prohibiting possessing within the Sanctuary (regardless of where taken from, moved, or removed from) any marine mammal, sea turtle, or seabird, except as authorized by the MMPA, ESA, MBTA, or any regulation, as amended, promulgated under the MMPA, ESA, or MBTA, these Sanctuary resources would remain protected but not to the extent possible with this Sanctuary regulation in place. The proposed regulation is intended to afford special protection for and civil penalty deterrence from possession of the abundant marine mammal and seabird populations found in the CINMS, as well as special protection for sea turtles occasionally found within the Sanctuary. Thus, the no action alternative would not directly pose a serious risk of adverse impact to these species, but some adverse biological impacts could be possible if appropriate administration and enforcement of the ESA, MMPA and MBTA were not maintained within the CINMS. In addition, adverse socioeconomic impacts associated with the no action alternative would be possible for users dependent upon continued protection of these species within the Sanctuary (*e.g.*, recreation, tourism, research and education), but only under a possible scenario of unsatisfactory administration and enforcement of the ESA, MMPA, and MBTA within CINMS.

4.3.10 Tampering with Sanctuary Signs

Without adoption of the proposed new regulation prohibiting marking, defacing, damaging, moving, removing, or tampering with any sign, notice, or placard, whether temporary or permanent, or any monument, stake, post or other boundary marker related to the Sanctuary, there would be no expected adverse impact to the biological or historical resources of the sanctuary. To the extent that the physical environment of the Sanctuary includes signage, the no action alternative could potentially result in adverse impacts from vandalism, theft, or other damage to these signs and markers because there would not be a legal deterrence mechanism as would be provided by the proposed prohibition. If such damage did occur to Sanctuary signs, there could be some temporary minor socioeconomic impact to any users of the Sanctuary dependent upon or interested in learning from the Sanctuary's signage or markers.

4.3.11 Releasing an Introduced Species

Without adoption of the proposed new regulation prohibiting introducing or otherwise releasing an introduced species from within or into the Sanctuary, except striped bass (*Morone saxatilis*) released during catch and release fishing activity, the Sanctuary environment would be at additional risk of adverse biological impacts from such introductions. Although other laws and regulations establish federal programs to help prevent introduced species introductions via ballast water, and although spawning, incubating or cultivating transgenic and exotic species is prohibited in California marine waters (Fish and Game Code sec. 15007), existing rules do not afford prohibitions against non-transgenic introduced species introductions in state waters, and against any form of introduced species introductions in federal waters of the CINMS. As such, under the no action alternative the Sanctuary would remain vulnerable to introductions that might otherwise be prevented using the legal civil penalty deterrence of the NMSA. Resulting biological impacts are numerous, and presented at FEIS section 3.5.5. Possible socioeconomic impacts associated with the release of introduced species within the Sanctuary are numerous as well, and include such impacts as altering or degrading commercial and recreational fisheries, altering habitat and species assemblages in a manner that degrades non-consumptive recreational or tourism activities such as diving or wildlife viewing, and compromise research and education activities.

4.3.12 Operation of Motorized Personal Watercraft

Without adoption of the proposed new regulation prohibiting the operation of motorized personal watercraft within waters of the Channel Islands National Park, the Sanctuary would still remain legally protected from the adverse impacts of these craft but not to the extent possible with the proposed Sanctuary regulation in place. The intent of this proposed Sanctuary regulation is to augment the Park's enforcement capabilities by providing additional and stronger legal deterrence from higher NMSA penalties levied through an administrative (civil) rather than a criminal process. Thus, the no action alternative would not directly increase adverse impacts to Sanctuary resources and qualities from the MPWC use (see FEIS section 4.1.13 for details on those possible impacts), but some adverse biological impacts could be possible if appropriate administration and enforcement of the National Park Service ban within CINP were not maintained. In addition, some adverse socioeconomic impacts associated with the no action alternative would be possible for users dependent upon protection of wildlife that MPWC might disturb or aesthetic conditions that MPWC might disrupt (*e.g.*, recreation, tourism, research and education), but only under a possible but not expected scenario of unsatisfactory administration and enforcement of the National Park Service ban within CINP.

4.3.13 Department of Defense Activities

Without adoption of the proposed modification of the existing regulation pertaining to Department of Defense (DOD) activities, the Sanctuary would be providing DOD an exemption to other CINMS regulations for military operations based on an out-of-date (1982) list of activities. In addition, a no action alternative would mean the current DOD regulation would not be expressly consistent with the NMSA, which has been reauthorized several times since the DOD regulation went into effect (1982). The proposed regulation would require that all DOD activities be carried out in a manner that avoids to the maximum extent practicable any adverse impacts on Sanctuary resources and qualities, and would also require that in the event of destruction of, loss of, or injury to a Sanctuary resource or quality resulting from an incident, including, but not limited to, discharges, deposits, and groundings, caused by a DOD activity, DOD, in coordination with the NMSP Director, must promptly prevent and mitigate further damage and must restore or replace the Sanctuary resource or quality in a manner approved by the NMSP Director. Because these safeguards to Sanctuary resources and qualities would not be part of the no action alternative (except to the extent covered by section 304(d) of the NMSA), the no action alternative would continue to expose the Sanctuary environment to possible adverse impacts to biological, physical, and historical resources that might be caused by military operations.

4.3.14 Permit Procedures and Issuance Criteria

Without adoption of proposed modifications to the existing permit procedure regulation, the Sanctuary would continue to operate with regulations that do not provide a clear mechanism to guide issuance of permits for activities that would further Sanctuary management. Although the no action alternative would therefore not provide the additional clarity desired and needed, it is not expected that the status quo permit language would necessarily result in adverse impacts to the biological, physical, historical, or socioeconomic environment of the Sanctuary.

4.4 OTHER REQUIRED EIS SECTIONS

4.4.1 Irreversible and Irretrievable Commitment of Resources

No irreversible or irretrievable commitment of resources would occur with the implementation of the proposed regulatory changes under the Proposed Action or Alternative 1. The primary focus of these

regulations is to enhance and improve management of the Sanctuary and its resources, therefore long-term beneficial impacts would be expected upon implementation of these proposed changes under either the Proposed Action or Alternative 1.

4.4.2 Relationship Between Short-Term Costs and Maintenance and Enhancement of Long-Term Productivity

The short-term costs of updating the existing regulations of the NMSA for the CINMS, under the Proposed Action or Alternative 1, would be minor when compared to the benefit to Sanctuary resources resulting from improved resource protection and management. Alternative 1 would have higher short-term costs on human uses than the Proposed Action. As described above, the regulatory changes are designed to protect Sanctuary resources as well as to improve management of the area. Therefore, the minor short-term costs incurred from these regulatory updates would be minimal when compared to the long-term benefits under both the Proposed Action and Alternative 1.

4.4.3 Unavoidable Significant Adverse Impacts

As described in FEIS section 4, no unavoidable significant adverse impacts were identified for any of the proposed regulatory updates under either the Proposed Action or Alternative 1. The project would instead be expected to have a long-term beneficial impact on the CINMS and its resources and qualities.

4.4.4 Environmental Justice

Environmental justice is defined by the U.S. EPA as "the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies."

The proposed regulatory updates under the Proposed Action and Alternative 1 would have no negative effect on the natural or physical environment or health that would affect minority or low-income populations or children when compared to the general population. The CINMS is an uninhabited region. In addition, the project would *not increase* the risk or rate of environmental hazard exposure by a minority or low-income population; conversely, it would *reduce* those risks within the CINMS boundary by eliminating potential for hazards to occur. Finally, the proposed regulatory updates under both the Proposed Action and Alternative 1 would have less than significant adverse impacts on human use of the Sanctuary. Therefore, no impacts would occur for any issue related to environmental justice.

4.4.5 Growth-Inducing Impacts

Growth inducement encompasses economic or population growth, or the construction of additional housing in the area surrounding the Proposed Action or Alternative 1. The proposed regulatory changes would incur no growth-inducing impacts since the regulatory changes would not affect growth in the Sanctuary and no development is proposed under the Proposed Action and Alternative 1.

4.5 SOCIOECONOMIC IMPACTS SUMMARY (ALL ALTERNATIVES)

User groups potentially affected by the proposed regulatory changes under the Proposed Action or Alternative 1 include: Offshore oil and gas industry, telecommunications industry, minerals operations, shipping, cruise lines and other large vessel operators, ports and harbors, commercial fishing industry, recreational users and associated marine recreation and tourism business operations, marine salvage businesses, motorized personal watercraft users, pilots and charter aircraft businesses, research and scientific users, educational users, and the Department of Defense.

As mentioned throughout FEIS sections 4.1 and 4.2, there would be either no impacts to human uses of the Sanctuary from the Proposed Action and Alternative 1 regulatory changes, or such impacts would be less than significant. As a result, no significant socioeconomic impacts to any of these user groups have been identified for any of the proposed regulatory changes for both the Proposed Action and Alternative 1. Although the proposed regulations would have the potential to preclude certain *future* uses, such as mineral mining, and the "opportunity cost" of these uses would not be realized, no significant adverse impact would be anticipated since these uses do not currently occur and are generally not anticipated to occur within the CINMS boundary.

4.6 CUMULATIVE IMPACTS

As stated at the beginning of this section, CEQ regulations implementing NEPA require an assessment of the cumulative impacts of a proposed action (40 CFR parts 1500-1508). A cumulative impact is an "impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-federal) or person undertakes such other actions" (40 CFR 1508.7). Cumulative impacts can result from individually minor but collectively significant actions taking place over time, and may be additive, countervailing, or synergistic. There are four types of cumulative effects: single action/additive, single action/interactive, multiple action/additive, and multiple action/interactive. This section identifies potential cumulative impacts from the Proposed Action as a single action, along with potential cumulative impacts that may result from a combination of the Proposed Action and other actions that overlap those of the proposed action, and/or whose impact zones overlap areas occupied by resources affected by the proposed action.

As a single action, the Proposed Action is not likely to have additive cumulative impacts on the Sanctuary environment and may potentially only have very limited additive cumulative effects on human uses of the Sanctuary. In terms of the Sanctuary environment, just as the Proposed Action is a single action that would take immediate effect upon its adoption and be applied consistently thereafter, so would its beneficial impact upon the Sanctuary be achieved immediately and remain consistent thereafter. However, in some instances, such as prohibiting the discharge/deposit of meals from vessels and clarifying that the discharge regulation prohibits discharge of untreated sewage, there may be some lag time between the adoption of the Proposed Action and recognizable benefits to the Sanctuary environment. This is not seen as an additive cumulative impact as once beneficial impacts are realized they should remain consistent as long as the suite of regulations contained in the Proposed Action are in effect. As a single action, the Proposed Action may result in some additive cumulative impacts upon existing human uses of the Sanctuary. Potential additive cumulative impacts may result from the prohibition of discharging meals from vessels in the case of Sanctuary users opting to travel outside the Sanctuary boundary solely for the purpose of discharging food wastes. Since other existing federal regulations prohibit the discharge of food from 0 to 3 nmi offshore (33 CFR part 151 *et seq.*), the potential cumulative impacts may result strictly from the requirement that food waste be discharged beyond 6 nmi offshore from the Islands rather than merely at 3 nmi offshore. Additive cumulative impacts are most plausible for users who engage primarily in multi-day trips within the Sanctuary and could result from the cumulative added costs associated with traveling from 3 to 6 nmi offshore to dispose of food waste during individual visits to the Sanctuary over the long-term. However, cumulative additive effects are not likely to result if Sanctuary users opt to hold food wastes on board during their visits to the Sanctuary and subsequently discharge them beyond 6 nmi offshore during their final departure from the Sanctuary, or dispose of them appropriately once onshore. No other elements of the Proposed Action are anticipated to have the potential for additive cumulative effects on Sanctuary users. This is because the remaining elements of the Proposed Action that have been identified as having the potential for direct but less than significant adverse impacts on human uses of the Sanctuary are either related to potential human

uses of the Sanctuary not presently known to occur (*e.g.* minerals mining and non-fishing-related discharge/deposit of fish, fish parts, or chumming material), or are anticipated to result in no substantive difference from the status quo scenario of lawful activities.

As a single action the Proposed Action has the potential for interactive cumulative impacts on the Sanctuary environment, as well as interactive cumulative impacts on human uses of the Sanctuary. In both cases interactive cumulative impacts are anticipated to be beneficial in nature. As discussed in preceding portions of this section, many elements of the Proposed Action are anticipated to have a beneficial impact on components of the Sanctuary environment. These individual beneficial impacts may cumulatively yield an even greater benefit to the Sanctuary environment as a whole, and in turn may benefit select human uses of the Sanctuary. For example, clarifying that discharges from MSDs are only allowed via operable Type I or Type II (USCG classification) MSDs, prohibiting discharge/deposit of food wastes within the Sanctuary, and prohibiting introducing or otherwise releasing introduced species may result in potential benefits to Sanctuary water quality, sustain natural food webs (rather than altering these through anthropogenic food sources), and aid in maintaining a natural community structure within the CINMS ecosystem. Each of these potential impacts is singularly beneficial, but these impacts may interact to sustain a healthier Sanctuary environment than possible through any of the singular impacts alone. In turn, these potential interactive cumulative impacts may potentially foster beneficial impacts to human uses such as commercial fishing, recreational fishing, and non-consumptive recreational activities.

Since cumulative impacts may also result from the Proposed Action coupled with other actions that have the potential to impact the same resources, below is a discussion of other actions which have been completed or are being conducted and that are closely related to the Proposed Action.

- ***Federal Marine Reserves and Conservation Areas*** As described in FEIS section 1.0, in 2007 NOAA completed a separate NEPA analysis and rulemaking process (72 FR 29208) to complete the Channel Islands marine protected area (MPA) network by augmenting the marine protected areas established by the state. NOAA's action added nine new marine zones to the Federal waters of the Sanctuary: eight marine reserves and one marine conservation area. All extractive activities (*e.g.*, removal of any Sanctuary resource) and injury to Sanctuary resources are prohibited in the marine reserves. Lobster harvest and recreational fishing for pelagic finfish are allowed within the marine conservation area, but all other extraction and injury to sanctuary resources is prohibited. Since the regulatory changes proposed in this FEIS would not affect extractive activities prohibited in the federally established marine reserves and conservation areas within the Sanctuary, cumulative effects of the establishment of marine reserves and conservation areas combined with the proposed regulatory changes analyzed in this FEIS would not be significant.

- ***State Marine Reserves and Conservation Areas*** In 2001, the California Fish and Game Commission directed the California Department of Fish and Game (CDFG) to initiate a State rulemaking process based on recommendations from the NMSP and CDFG. The CDFG prepared environmental documents in accordance with the California Environmental Quality Act (CEQA) that included an analysis of five alternative reserve networks and a noproject alternative (CDFG 2002). The alternatives analyzed in the CEQA document were split into an initial State-phase and subsequent Federal Phase. The NMSP and CDFG's recommended network was identified as the preferred alternative (CDFG 2002). The State's rulemaking process and Environmental Impact Report (EIR) assessed the potential cumulative effects of implementing marine zones in both State and Federal waters of the CINMS. In October 2002, the California Fish and Game Commission approved the preferred alternative in the EIR that included ten marine reserves and two conservation areas within State waters, encompassing approximately 102 square nmi of the CINMS. Since the regulatory changes proposed in this FEIS would not affect extractive activities

prohibited in the state established marine reserves and conservation areas within the Sanctuary, cumulative effects of the establishment of marine reserves and conservation areas combined with the proposed regulatory changes analyzed in this FEIS would not be significant.

- ***CINMS Boundary Expansion*** As described in FEIS section 1.0 (as well as the Boundary Evaluation Action Plan in Vol. 1, Final Management Plan), in the future, NOAA plans to consider a potential boundary expansion for the CINMS. NOAA will consider this potential action separately and evaluate it in a separate supplemental environmental impact statement (SEIS). Therefore, the cumulative effects of the proposed action and this project are currently unknown. However, since the existing or proposed CINMS regulations would not necessarily apply to an expanded boundary, were the boundary to be expanded, cumulative effects of a boundary expansion combined with the proposed regulatory changes would not be considered significant at this time.

- ***Pacific Coast Groundfish Fishery Management Plan and Essential Fish Habitat Designation*** In 2006 the National Marine Fisheries Service (NMFS) issued a final rule implementing the regulatory provisions of Amendment 19 to the Pacific Coast Groundfish Fishery Management Plan (FMP) (71 FR 27408). Amendment 19 provides for a comprehensive program to describe and protect essential fish habitat (EFH) for Pacific Coast Groundfish. As part of the Amendment 19 regulation, NMFS prohibited the use of bottom contact fishing gear in the federal waters of the marine reserves and conservation areas within CINMS. Since the Sanctuary's proposed action does not have direct effects on the fishing uses affected by the EFH final rule, cumulative effects of this action with the proposed regulatory changes would not be significant.

- ***Channel Islands National Park Management*** Existing NPS regulations in effect at CINP coupled with the Proposed Action would have additive cumulative impacts upon illegal MPWC use as both would ban this activity within waters of the Park, and each regulation has an associated penalty for illegal use. CINP current management, and future implementation of a new General Management Plan currently under development, address the terrestrial management issues for the CINP and develop long-term policy recommendations to enhance the management of the Channel Islands under CINP jurisdiction. Since the CINP and CINMS work closely together in managing the overlapping areas of their jurisdiction, the regulatory updates proposed by the CINMS would complement future management strategies of the terrestrial environment. Cumulatively, interactive beneficial impacts of the two agencies' management plans would be expected to enhance and protect the environment in and around the CINMS.

- ***U.S. Navy Point Mugu Sea Range Expansion*** In 2002 the U.S. Navy published a Final Environmental Impact Statement in which they analyzed the impacts of expanding the Naval Air Warfare Center Weapons Division Point Mugu in order to: accommodate Theatre Missile Defense testing and training, to accommodate an increase in Fleet training exercises and special warfare training, and to modernize facilities at Naval Air Station Point Mugu and San Nicolas Island to support existing and future operations. A current description of Navy activities that may occur within the Sanctuary is described at section 3.5.9 of this FEIS, and a description of the potential impacts of these activities is described at section 4.1.13 of this FEIS.

- ***Offshore Oil and Gas Leasing*** Currently, there are 79 Outer Continental Shelf (OCS) oil and gas leases offshore of Southern California. These include 39 developed (producing) leases and 36 undeveloped leases offshore from San Luis Obispo, Santa Barbara, and Ventura counties, and four developed leases offshore from Los Angeles and Orange counties. Production from these leases is expected to continue for the next five to 20 years. The Minerals Management Service

(MMS) currently has no proposals for decommissioning offshore facilities. Development of the 36 undeveloped leases is uncertain due to ongoing litigation. In addition, four undeveloped leases are under appeal. MMS has prepared six Environmental Assessments (EAs) to analyze the environmental impacts of granting lease suspensions for the undeveloped leases and six Consistency Determinations for the California Coastal Commission. If lease suspensions are granted oil and gas exploration may occur within those leases, one of which (the Cavern Point Unit) straddles the Sanctuary's eastern boundary. Exploration activities, depending on how they are conducted, could potentially lead to adverse impacts on Sanctuary resources and qualities (*e.g.*, seismic surveys may result in acoustic impacts on marine life).

- ***Energy Policy Act*** On August 8, 2005, President George W. Bush signed the Energy Policy Act (42 U.S.C. 15801 *et. seq.*) into law. This law grants the MMS new responsibilities over Federal offshore renewable energy and related-uses of America's offshore public lands, also known as the Outer Continental Shelf (OCS). Section 388 of the Energy Policy Act provides an initiative to facilitate increased renewable energy production on the OCS. It gives the Secretary of the U.S. Department of the Interior the authority to: grant lease, easements or rights-of way for renewable energy-related uses on Federal OCS lands; act as a lead agency for coordinating the permitting process with other Federal agencies; and monitor and regulate those facilities used for renewable energy production and energy support services. Since established in 1982, the MMS has been designated by the Department to oversee the management of oil, gas, and other mineral activities on offshore Federal lands. Given the agency's expertise and experience in managing such complex programs, the MMS assumes this new authority as outlined in section 388. Section 388 clarifies the Secretary's authority to allow an offshore oil and gas structure, previously permitted under the OCS Lands Act, to remain in place after oil and gas activities have ceased in order to allow the use of the structure for other energy and marine-related activities, such as research, renewable energy production, military facility, aquaculture, etc., before being removed. Section 388 further gives the Secretary the authority to establish an interagency comprehensive digital mapping effort to assist in decision-making related to renewable energy activity. Section 388 does not authorize any leasing, exploration or development activities for oil or natural gas. Any congressional moratoria and administrative withdrawals in effect remain unchanged.

- ***Port of Long Beach Expansion*** According to the *Port of Long Beach Master Plan* (2003), the Los Angeles Port Authority plans to expand capacity of the harbor, which will increase both the number and size of the vessels that use the Santa Barbara Channel. Because large vessel traffic tends to adhere to the voluntary traffic separation scheme established in the Santa Barbara Channel, and since neither of the associated shipping lanes lies within 1 nmi of Islands shores, no cumulative impact on large vessel traffic is expected to result from the Proposed Action coupled with the Port of Long Beach Expansion.

- ***Proposed Liquefied Natural Gas Terminal*** A proposal to develop a liquefied natural gas terminal to the east of the Sanctuary (outside the Sanctuary boundary) is currently being developed and evaluated. Crystal Energy is proposing to use Platform Grace, an existing oil and gas platform currently owned by Venoco, Inc., as an LNG import and regasification facility. The platform is located approximately 12.1 miles offshore from Ventura County, in federal waters and approximately 10 miles north of Anacapa Island. While the proposal would not overlap the Sanctuary, it may have the potential to result in an impact on Sanctuary resources and qualities either directly, or indirectly. Potential indirect impacts of concern in terms of cumulative impacts would be the potential for increased shipping traffic associated with the proposed facility. This potential for increased traffic coupled with the potential for increased shipping traffic resulting from the Port of Long Beach expansion could result in additive cumulative impacts upon Sanctuary resources and qualities from large vessel traffic.

- ***California Clean Coast Act*** The California Clean Coast Act (California Public Resources Code sec. 72420 – 72422) went into effect on January 1, 2006, and is described in more detail in FEIS sections 3.5.3.4 and 5.2. It is intended to prohibit releases of graywater, sewage, and sewage sludge into marine waters of the state (including waters within a national marine sanctuary) from both large passenger vessels (cruise ships) and oceangoing ships with sufficient holding tank capacity. Pursuant to section 1322(f) of the CWA, the State of California submitted an application to the U.S. EPA to prohibit sewage and sewage sludge discharges from large passenger vessels and oceangoing ships within state waters. While California is awaiting approval of this application the California Clean Coast Act prohibitions on the release of sewage and sewage sludge discharges from large passenger vessels and ocean ships with sufficient holding tank capacity are not in effect. This act also states that the State Water Resources Control Board shall request the appropriate federal agencies to prohibit the release of sewage sludge (with exceptions for certain emergencies and vessels under innocent passage) by large passenger vessels and oceangoing ships in all of the waters that are in the Channel Islands, Cordell Bank, Gulf of the Farallones, and Monterey Bay national marine sanctuaries. This act also requires both regulated classes of vessels to notify the State Water Resources Control Board of any releases of graywater into the marine waters of the state (including state waters within a national marine sanctuary), and to provide to the California State Lands Commission a list of specified vessel data and information for all vessels operating in waters of the state in 2006.

  Additive cumulative impacts upon cruise ships and oceangoing ships are not expected to occur as a result of this state action coupled with the revised prohibitions, nor coupled with the full revised proposed action. Large vessels in the vicinity of the Channel Islands are customarily in the area mainly to use the TSS. No part of the TSS near the Channel Islands is in state waters but not Sanctuary waters. Therefore, all impacts likely to occur in this area as a result of any future state prohibitions on discharges of sewage or sewage sludge would already have occurred in Sanctuary waters as a result of Sanctuary regulations. Regarding graywater prohibitions, the portion of Sanctuary waters in which state law already prohibits graywater discharges from cruise ships, and oceangoing ships with sufficient holding tank capacity, and through which these ships are likely to travel (the southeast-bound TSS lane) is 16 nmi long. The Sanctuary regulation would only add an additional 21 nmi to that distance through which these ships could not discharge graywater.

- ***Joint Management Plan Review*** In 2007, the Monterey Bay National Marine Sanctuary (MBNMS), Cordell Bank National Marine Sanctuary (CBNMS), and Gulf of the Farallones National Marine Sanctuary, all located off the central California coast, released a draft joint management plan for public review and comment. Like the CINMS draft management plan, this joint plan contained proposed updates to each relevant national marine sanctuary's regulations and non-regulatory programs. NOAA is completing updates to MBNMS, CBNMS, and GFNMS regulations that would limit discharges from large vessels (cruise ships, and vessels greater than 300 GRT) in these sanctuaries. The pending regulations include a prohibition on cruise ship waste discharges (71 FR 194) and a prohibition on treated sewage discharge from large vessels (≥300 GRT) within these three national marine sanctuaries, as well as a prohibition on large-vessel graywater discharge within the MBNMS. These discharge prohibitions would provide an exception for oceangoing ships that lack sufficient holding capacity to retain sewage within any of the three sanctuaries, or to retain graywater while within the MBNMS.

  NOAA's proposed regulation changes regarding large vessel sewage and graywater discharges at CINMS, taken in combination with NOAA's regulatory proposals for the central California national marine sanctuaries, would produce a cumulative beneficial effect on the biological,

physical and esthetic resources found at each of these sites. The nature of these cumulative beneficial effects expected would be the same those described in sections 4.1.3.4 and 4.1.3.5 of this document.

Because much of the same shipping traffic and cruise ships that pass through the CINMS may also transit shipping lanes that run through the MBNMS and GFNMS, or call upon ports within or adjacent to these sanctuaries, it is relevant to consider the possible cumulative socioeconomic effects of the collective actions being considered by NOAA for all four California national marine sanctuary sites. NOAA expects that the shipping and industries will experience less than significant adverse socioeconomic effects from these combined proposed regulatory actions because of the exceptions to be provided. In particular, adverse socioeconomic impacts are avoided because of the exceptions provided for large vessels that cannot retain treated sewage within the much larger (than CINMS) area composed of the three contiguous central California sanctuaries. Furthermore, because the MBNMS contains within its boundaries the longest extent of shipping lanes, relative to other California sanctuaries, adverse socioeconomic impacts are reduced, as with CINMS, because of the proposed exception for graywater discharge from large vessels lacking the ability to retain graywater while within CINMS and MBNMS.

While the Proposed Action does in effect overlap with additional applicable Federal and State regulations (see FEIS section 5.0), no other cumulative effects are anticipated. This is due to: the clarifying nature of many elements of the Proposed Action, which are not anticipated to result in any individual nor cumulative new impacts upon existing human uses; the elements of the Proposed Action aimed at prohibiting activities which have not historically, do not currently, and have not been proposed to occur in the foreseeable future (*e.g.*, minerals mining, altering the seabed from 2 to 6 nmi offshore) and therefore are not predicted to have individual or cumulative significant impacts on such activities; and those elements of the Proposed Action aimed at complementing existing prohibitions enforced by other agencies, with the intent of adding greater civil penalty deterrence against already illegal activities when they occur within the Sanctuary, or simply to bring greater place-based focus to the importance of protecting the nationally significant resources and qualities of the Channel Islands.

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5.0 FEDERAL AND STATE LAW

The following summaries of applicable federal regulations and state law are arranged by the following categories:

- Offshore Energy Source and Mineral Exploration and Development;
- Discharging or Depositing Matter into the Marine Environment;
- Protection of Submerged Lands;
- Navigation of Vessels;
- Protection of Marine Mammals, Seabirds, and Sea Turtles;
- Protection of Historical/Cultural Resources in the Marine Environment;
- Introduced Species in the Marine Environment;
- Operation of Motorized Personal Watercraft; and
- Other Federal and State Laws.

5.1 OFFSHORE ENERGY SOURCE AND MINERAL EXPLORATION AND DEVELOPMENT

Federal Law

Oil Pollution Act of 1990 (OPA), 33 U.S.C. 2701 *et seq.*, inter alia

OPA amends section 311 of the CWA, 33 U.S.C. 1321 *et seq.*, to clarify federal response authority, increase penalties for spills, establish U.S. Coast Guard response organizations, require tank vessel and facility response plans, and provide for contingency planning in designated areas. OPA, however, does not preempt states' rights to impose additional liability or other requirements with respect to the discharge of oil within a state or to any removal activities in connection with such a discharge.

OPA is a comprehensive statute designed to expand oil spill prevention, preparedness, and response capabilities of the federal government and industry. OPA establishes a new liability regime for oil pollution incidents in the aquatic environment and provides the resources necessary for the removal of discharged oil. OPA consolidates several existing oil spill response funds into the Oil Spill Liability Trust Fund (Trust Fund), resulting in a $1-billion fund to be used to respond to, and provide compensation for damages caused by, discharges of oil. In addition, OPA provides new requirements of response planning by both government and industry and establishes new construction, manning, and licensing requirements for tank vessels. OPA also increases penalties for regulatory noncompliance and broadens the response and enforcement authorities of the federal government.

Title I of OPA contains liability provisions governing oil spills modeled after CERCLA, 42 U.S.C. 9601 *et seq.*, and section 311 of the CWA. Specifically, section 1002(a) of OPA provides that the responsible party for a vessel or facility from which oil is discharged, or which poses a substantial threat of a discharge, is liable for:

- Certain specified damages resulting from the discharged oil; and
- Removal costs incurred in a manner consistent with the National Contingency Plan.

The scope of damages for which there may be liability under section 1002 of OPA includes:

- Natural resource damages, including the reasonable costs of assessing these damages;
- Loss of subsistence use of natural resources;
- Real or personal property damages;
- Net loss of tax and other revenues;
- Loss of profits or earning capacity; and
- Net cost of additional public services provided during or after removal actions.

Submerged Lands Act (SLA), (43 U.S.C. 1301 *et seq.*)

Under the SLA the location of energy and mineral resources determines whether or not they fall under state control. The SLA granted states title to the natural resources located within three miles of their coastline (three marine leagues for Texas and the Gulf coast of Florida). For purposes of the Submerged Lands Act, the term "natural resources" includes oil, gas and all other minerals and marine animal and plant life. States' implementation of the SLA is discussed below under State Law.

Outer Continental Shelf Lands Act (OCSLA), 43 U.S.C. 1331 *et seq.*

The OCSLA established federal jurisdiction over submerged lands on the OCS seaward of state boundaries. Under the OCSLA, the Secretary of the Interior is responsible for the administration of mineral exploration and development of the OCS. The OCSLA empowers the Secretary of the Interior to grant leases to the highest qualified responsible bidder(s) on the basis of sealed competitive bids and to formulate such regulations as necessary to carry out the provisions of the OCSLA. The OCSLA provides guidelines for implementing an OCS oil and gas exploration and development program, and authorities for ensuring that such activities are safe and environmentally sound. The basic goals of the OCSLA include the following:

- To establish policies and procedures for managing the oil and natural gas resources of the OCS that are intended to result in expedited exploration and development of the OCS in order to achieve national economic and energy policy goals, assure national security, reduce dependence on foreign sources, and maintain a favorable balance of payments in world trade;
- To preserve, protect, and develop oil and natural gas resources of the OCS in a manner that is consistent with the need (a) to make such resources available to meet the nation's energy needs as rapidly as possible; (b) to balance orderly resource development with protection of the human, marine, and coastal environments; (c) to ensure the public a fair and equitable return on the resources of the OCS; and (d) to preserve and maintain free enterprise competition;
- To encourage development of new and improved technology for energy resource production, which will eliminate or minimize risk of damage to the human, marine, and coastal environments; and

- To provide opportunities for state and local government participation in policy and planning decisions made by the federal government relating to exploration for, and development and production of, minerals on the OCS.

Deep Seabed Hard Mineral Resources Act, 30 U.S.C. 1401 *et seq.*

The Deep Seabed Hard Mineral Resource Act provides for regulations for developing deep seabed hard minerals, requires consideration of environmental impacts prior to issuance of mineral development permits, and requires monitoring of environmental impacts associated with any mineral development activities. With regard to minerals on the deep seabed, seabed nodules contain nickel, copper, cobalt and manganese - minerals important to many industrial uses. No commercial deep seabed mining is currently conducted, nor is such activity anticipated in the near future. However, four licenses have been issued under the Deep Seabed Hard Mineral Resources Act for exploration of seabed areas in the Clarion-Clipperton zone of the South Pacific Ocean.

Ocean Thermal Energy Conversion Act (OTEC Act), 42 U.S.C. 9101 *et seq.*

With regard to alternative energy sources from the ocean, the OTEC Act established a licensing program for facilities and plants that would convert thermal gradients in the ocean into electricity. The OTEC Act directed the Administrator of NOAA to establish a stable legal regime to foster commercial development of OTEC. In addition, the OTEC Act directed the Secretary of the department in which the USCG is operating to promote safety of life and property at sea for OTEC operations, prevent pollution of the marine environment, clean up any discharged pollutants, prevent or minimize any adverse impacts from construction and operation of OTEC plants, and ensure that the thermal plume of an OTEC plant does not unreasonably impinge on and thus degrade the thermal gradient used by any other OTEC plant or facility, or the territorial sea or area of national resource jurisdiction of any other nation unless the Secretary of State has approved such impingement after consultation with such nation. The OTEC Act also assigned responsibilities to the Secretary of State and the Secretary of Energy regarding OTEC plants.

Energy Policy Act, 42 U.S.C. 15801 *et. seq.*

On August 8, 2005, President George W. Bush signed the Energy Policy Act () into law. This law grants the MMS new responsibilities over Federal offshore renewable energy and related-uses of America's offshore public lands, also known as the Outer Continental Shelf (OCS). Section 388 of the Energy Policy Act provides an initiative to facilitate increased renewable energy production on the OCS. It gives the Secretary of the U.S. Department of the Interior the authority to: grant lease, easements or right-of ways for renewable energy-related uses on Federal OCS lands; act as a lead agency for coordinating the permitting process with other Federal agencies; and monitor and regulate those facilities used for renewable energy production and energy support services. Since established in 1982, the MMS has been designated by the Department to oversee the management of oil, gas, and other mineral activities on offshore Federal lands. Given the agency's expertise and experience in managing such complex programs, the MMS assumes this new authority as outlined in section 388. Section 388 clarifies the Secretary's authority to allow an offshore oil and gas structure, previously permitted under the OCS Lands Act, to remain in place after oil and gas activities have ceased in order to allow the use of the structure for other energy and marine-related activities, such as research, renewable energy production, military facility, aquaculture, etc., before being removed. Section 388 further gives the Secretary the authority to establish an interagency comprehensive digital mapping effort to assist in decision-making related to renewable energy activity. Section 388 does not authorize any leasing, exploration or development activities for oil or natural gas. Any congressional moratoria and administrative withdrawals in effect remain unchanged.

State Law

Submerged Lands Act (SLA), (43 U.S.C. 1301 *et seq*.)

Pursuant to the authority of the federal SLA state authorities range in the nature and extent of their control over ocean energy and mineral resources on state submerged lands. The range depends on each state's evaluation of different policy interests, such that activities may be restricted in certain areas and allowed in others. State management authority for oil and gas exploration and production on state submerged lands may be implemented by more than one state entity. Also, state management of energy and mineral resources is often addressed within the context of a broader state coastal management plan.

State policies also affect energy and mineral resource development on the OCS. As indicated above, federal authorities such as the OCSLA provide for consultation and coordination with affected coastal states.

5.2 DISCHARGING OR DEPOSITING MATTER INTO THE MARINE ENVIRONMENT

Federal Law

Act to Prevent Pollution from Ships (APPS), 33 U.S.C. 1901 *et seq*.

a. Oil and Noxious Liquid Substances.

The Act to Prevent Pollution from Ships (APPS), as originally enacted, implemented Protocols I and II, and Annexes I and II, of the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 (MARPOL). Annex I of MARPOL establishes requirements to prevent the discharge of oil except in accordance with specific conditions. Annex II provisions cover the discharge of noxious liquid substances. (Annex III, which addresses the prevention of pollution by harmful substances carried by sea in packaged forms, or in freight containers, portable tanks, or road and rail wagons, is implemented by the Hazardous Material Transportation Act (49 U.S.C. 5101 *et seq., inter alia*.)

APPS applies to all United States flag ships anywhere in the world and to all foreign flag vessels operating in the navigable waters of the United States or while at a port or terminal under the jurisdiction of the United States. The oil and noxious liquid substances provisions apply only to seagoing ships. The regulations implementing Annex I and Annex II of MARPOL limit discharges of oil and noxious substances, establish report requirements for discharges, and establish specific requirements for monitoring equipment and record keeping aboard vessels. In particular, the regulations require that vessels covered by APPS and MARPOL keep Oil Record Books in which all discharges, disposal, and transfers of oil are recorded.

b. Garbage and Plastics.

APPS was amended by the Marine Plastic Pollution Research and Control Act of 1987 (MPPRCA), which implemented the provisions of Annex V of MARPOL relating to garbage and plastics. Annex V of MARPOL and the regulations implementing it apply to all vessels subject to MARPOL, whether seagoing or not, regardless of flag, on the navigable waters of the United States and in the EEZ of the United States. It applies to United States flag vessels wherever they are located.

Under the regulations implementing the APPS, the discharge of plastics, including synthetic ropes, fishing nets, plastic bags, and biodegradable plastics, into the water is prohibited. Discharge of floating dunnage, lining, and packing materials is prohibited in the navigable waters and in areas offshore less than 25 nautical miles from the nearest land. Under APPS, the definition of ship includes fixed or floating platforms. There are separate garbage discharge provisions applicable to these units. For these platforms, and for any ship within 500 meters of these platforms, disposal of all types of garbage is prohibited. In addition, all manned, oceangoing United States flag vessels of 12.2 meters or more in length engaged in commerce, and all manned fixed or floating platforms subject to the jurisdiction of the United States, are required to keep records of garbage discharges and disposals. The implementing regulations specify that no person may discharge into the sea, if the distance from nearest land is less than 12 nautical miles, food wastes, paper products, rags, glass, metal, bottles, crockery and similar refuse. However, such garbage and trash may be discharged outside of three nautical miles from nearest land after it has been passed through a grinder or comminuter so that it passes through a screen with openings no greater than 25 millimeters (one inch).

Carriage of Liquid Bulk Dangerous Cargoes, 46 U.S.C. 3701–3718

This law governs the carriage of liquid bulk dangerous cargoes such as oil or hazardous materials. The chapter applies to any tank vessel operating in United States navigable waters or transferring oil or hazardous materials in any port subject to U.S. jurisdiction, with exemptions for certain vessels (section 3702). The Secretary is required to issue regulations for the design, construction, alteration, repair, maintenance, operation, equipping, personnel qualification, and manning of vessels subject to the chapter, necessary to protect life and property, for navigation and vessel safety, and protection of the marine environment (section 3703; regulations are found in 33 CFR and 46 CFR). Minimum standards for tank vessel construction are provided (section 3703a); requirements for coastwise trade vessels (section 3704); as well as minimum standards for crude oil tankers, product carriers, tankers, and self-propelled tank vessels, with certain exemption as authorized by the Secretary (sections 3705–3709). The Secretary is directed to establish a marine safety information system to contain information about vessels subject to the chapter (section 3717). Civil or criminal penalties may be assessed for violations of the chapter, including revocation of Customs Service clearance (section 3718).

Clean Vessel Act of 1992, subtitle F, 5601 to 5608, of Title V of Pub. L. 102–587, amending 16 U.S.C. 777c and 777g and see 33 U.S.C. 1322 note

The purpose of the Clean Vessel Act is to provide funds to states for the construction, renovation, operation and maintenance of pumpout stations and waste reception facilities. The act requires the Department of the Interior to issue guidance on what constitutes adequate and reasonably available pumpout facilities and waste reception facilities. In order to receive a grant, coastal states are to conduct a survey to determine the number and location of such stations and facilities and the number of recreational vessels in their coastal waters with toilets and develop and submit to the Department of the Interior for approval a plan for any construction or renovation necessary to provide adequate and reasonably available stations and facilities.

Section 6217 of the Coastal Zone Act Reauthorization Amendments of 1990, 16 U.S.C. 1455b

Section 6217 of Coastal Zone Act Reauthorization Amendments of 1990 required the coastal states with federally approved coastal zone management plans to develop and submit coastal nonpoint source pollution control programs for approval by NOAA and the U.S. Environmental Protection Agency (EPA). The submissions were to lay out a state program to restore and protect coastal waters by providing for the implementation of management measures developed by the U.S. EPA. The statute gave states 30 months from the date of publication of the final U.S. EPA guidance to submit a program to NOAA and U.S. EPA

for approval. The statute required that penalties be levied if a state failed to submit an approvable program within the allotted time. There has been no need to assess penalties as yet, as all the states have submitted programs found to be conditionally approvable and some have later been fully approved.

Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, (CERCLA), 42 U.S.C. 9601 *et seq.*

CERCLA is designed to respond to releases of hazardous substances and protect public health and environmental quality including natural resources.

CERCLA provides for the following two possible actions to protect the public and the environment from the harmful effects of a hazardous substance spill. Any combination of these two may be used at a particular spill.

(1) Response: CERCLA authorizes the U.S. to clean up the spilled substance either at the expense of the responsible party or with funds from the Superfund. CERCLA 104(a)(1). Example of steps include: dredging contaminated sediments, repairing leaking containers, collecting rain water runoff, and relocating displaced residents.

(2) Damages for natural resource injuries: CERCLA authorizes the trustees for natural resources to seek damages from responsible parties to restore or replace natural resources injured or destroyed by exposure to hazardous substances. CERCLA (107(a)(4)(C) and 107(f)).

Federal Water Pollution Control Act, also informally called the **Clean Water Act (CWA)**, 33 U.S.C. 1251 *et seq.*

The CWA establishes the basic scheme for restoring and maintaining the chemical, physical, and biological integrity of the nation's waters. The primary mechanism in the CWA regulating the discharge of pollutants is the National Pollutant Discharge Elimination System (NPDES), which is administered by the U.S. EPA. Under the NPDES program, a permit is required from U.S. EPA or an authorized state for the discharge of any pollutant from a point source into the waters of the United States. This includes discharges associated with oil and gas development on federal leases beyond state waters. A NPDES permit for certain storm water discharges also is required. In the case of discharges to the territorial sea or beyond, permits are also subject to the ocean discharge criteria developed under section 403 of the CWA. Permits for discharges into the territorial sea or internal waters may be issued by states following approval of their permit program by U.S. EPA; in the absence of an approved state permit program, and for discharges beyond the territorial sea, U.S. EPA is the permit-issuing authority.

The CWA was amended in 1987 to include the current non-point source (NPS) program. Under this program (section 319), states must develop management programs to address NPS runoff, including the identification of best management practices and measures. In addition, section 319 authorizes grants to assist the states in implementing their approved management programs.

The CWA generally prohibits discharges of oil and hazardous substances into coastal or ocean waters except where permitted under MARPOL. The USCG investigates and responds to discharges of oil and hazardous substances into coastal or ocean waters in accordance with the National Contingency Plan. The USCG, with the cooperation of U.S. EPA, generally administers the National Contingency Plan when oil or a hazardous substance is discharged into coastal or ocean waters. Regional contingency plans and area contingency plans are developed to implement the NCP.

The CWA (section 312) requires vessels with installed toilet facilities and operating on the navigable waters of the United States to contain operable marine sanitation devices certified as meeting standards and regulations promulgated under section 312. Section 312 also allows establishment of zones where discharge of sewage from vessels is completely prohibited. Amendments made to section 312 in 1996 require, where appropriate, the use of marine pollution control devices for operational, non-sewage, discharges from vessels of the Armed Forces.

Publicly owned sewage treatment facilities must, at a minimum, meet effluent limitations based on effluent reductions by secondary treatment, except for certain facilities discharging to coastal waters for which U.S. EPA has approved a waiver under section 301(h).

Section 320 of the CWA establishes the National Estuary Program, which uses a consensus-based approach for protecting and restoring estuaries. There are currently 28 estuaries in the program.

The U.S. Army Corps of Engineers (USACE) implements the section 404 permit program. Under section 404, a permit is required for the discharge of dredged or fill materials into the waters of the U.S. that lie inside of the baseline for the territorial seas and fill materials into the territorial seas within three miles of shore. Although USACE has the permitting responsibility under the section 404 program except in certain waters of two states (Michigan and New Jersey), which have assumed the authority, U.S. EPA is authorized to review and comment on the impact of proposed dredge and fill activities and to prohibit discharges that would have an unacceptable impact on municipal water supplies, shellfish beds and fishery areas, wildlife and recreational areas. U.S. EPA, in consultation with USACE, is charged with developing guidelines to be used in evaluating discharges subject to section 404. (40 CFR part 230.) The section 404 permit requirement is the cornerstone for the current wetlands regulatory program. If the USACE or U.S. EPA determines that a certain property is a jurisdictional wetland, no one can discharge dredged or fill materials into it without a section 404 permit. USACE and U.S. EPA also have cooperative agreements with the Natural Resources Conservation Service and rely on its determinations as to the presence of wetlands on agricultural lands.

Ocean Dumping Act (Titles I and II of the Marine Protection, Research, and Sanctuaries Act of 1972), 33 U.S.C. 1401 *et seq.*

The Ocean Dumping Act provides the basic authority for the U.S. EPA and the USACE to regulate ocean dumping (Title I) and for the Department of Commerce, through NOAA, to carry out research on the effects of ocean dumping and other man-induced changes on ocean systems (Title II).

Title I of the act: (1) prohibits any person, without a permit, from transporting from the United States any material for the purpose of dumping it into ocean waters (defined to mean those waters of the open seas lying seaward of the baseline from which the territorial sea is measured), and (2) in the case of a vessel or aircraft registered in the United States or flying the U.S. flag or in the case of a U.S. agency, prohibits any person, without a permit, from transporting from any location any material for the purpose of dumping it into ocean waters. Title I also prohibits any person, without a permit, from dumping any material transported from a location outside the United States into the territorial sea, or the contiguous zone extending 12 nautical miles seaward from the baseline of the territorial sea to the extent that it may affect the territorial sea or the territory of the United States. U.S. EPA issues permits regulating the ocean dumping, and the transportation for the purpose of dumping, of all material except dredged material, which is permitted by USACE. USACE permits are subject to U.S. EPA review and concurrence. The specific environmental criteria used to evaluate permit applications are developed by U.S. EPA; in the case of dredged material, this is done in coordination with USACE.

In developing criteria for the evaluation of permit applications, the statute provides that the following must be considered: (1) the need for the proposed dumping; (2) the effect of the dumping on human health and welfare, fisheries resources, marine ecosystems, and shorelines; (3) the persistence and permanence of the effects of the dumping; (4) the effect of dumping particular volumes and concentrations; (5) appropriate locations and methods of disposal or recycling, including land-based alternatives; and (6) the effect on alternate uses of the oceans.

The ocean dumping of sewage sludge and industrial waste is prohibited. In addition, radiological, chemical, or biological warfare agents, high-level radioactive waste, and medical waste may not be dumped. States may generally adopt and enforce requirements for ocean dumping activities that occur in their jurisdictional waters.

Title II of the Ocean Dumping Act requires the Department of Commerce, in coordination with the department in which the U.S. Coast Guard is operating (currently the Department of Homeland Security) and U.S. EPA, to conduct a comprehensive and continuing program of monitoring and research on the effects of dumping of material into ocean waters, coastal waters or into the Great Lakes. The title further requires the Department of Commerce, in close consultation with other appropriate departments, to conduct a comprehensive and continuing program of research into the possible long-range effects of pollution, over-fishing and human-induced changes of ocean ecosystems. The title specifies that the program must include continuing monitoring programs to assess the health of the marine environment, including but not limited to the monitoring of bottom oxygen concentration contaminant levels in biota, sediments and the water column, diseases in fish and shellfish, and changes in types and abundance of indicator species.

Shore Protection Act of 1988, 33 U.S.C. 2601 *et seq.*

Under the Shore Protection Act of 1988, municipal or commercial waste cannot be transported by a vessel in coastal waters without a permit from the Department of Transportation. Municipal or commercial waste includes solid waste as defined by the Resource Conservation and Recovery Act, but excludes waste generated by the vessel during normal operations, construction debris, dredged or fill material, and sewage sludge. The loading, securing and off loading of these wastes must be conducted in a manner to minimize any waste deposited into coastal waters.

Solid Waste Disposal Act also known as the **Resource Conservation and Recovery Act**, 42 U.S.C. 6901 *et seq.*

This act governs treatment, storage and disposal of solid and hazardous waste. The act also has as a goal the reduction of generation of hazardous waste.

Toxic Substances Control Act, 15 U.S.C. 2601 *et seq.*

This is the first comprehensive legislation governing toxic substances, including providing the federal government authority to prevent unreasonable risk of injury to health or the environment, particularly imminent hazards.

United States Public Vessel Medical Waste Anti-Dumping Act of 1988, 33 U.S.C. 2501 *et seq.*

This act prohibits public vessels from discharging medical waste except in extremely limited circumstances, because of the serious and widespread risks to public health and to the welfare of coastal communities. Potentially infectious medical waste may only be discharged by a public vessel if: (1) the health or safety of individuals on board the vessel is threatened or during a time of war or national

emergency; (2) the waste is released beyond 50 nautical miles from the nearest land; and (3) the waste is sterilized, properly packaged, and sufficiently weighted to prevent it from coming ashore.

Organotin Anti-Fouling Paint Control Act of 1988, 33 U.S.C. 2401 *et seq.*

Organotin biocides are added to paints to protect the bottom of boats from encrusting organism buildup. Because organotin has been shown to be toxic, it may pose unreasonable risks to marine and freshwater organisms. The act's purpose is to protect the aquatic environment by reducing the quantities of organotin entering the waters of the United States. The U.S. EPA is primarily responsible for the administration and enforcement of this statute.

The act generally prohibits boats less than 25 meters in length from using anti-fouling paint containing organotin. Aluminum hulls and lower drive shaft units of marine engines (outboard motors) are excepted from this act and allowed to use this paint. Penalties are available for violations. The U.S. EPA, in consultation with NOAA, was directed to monitor the ecological effects of organotin in estuaries and coastal waters for ten years beginning in 1988.

State Law

California Hazardous Waste Control Law imposes obligations on facilities for the generation of hazardous waste. The law applies to federal facilities insofar as the law requires permitting, inspections, and monitoring. State waste disposal standards, reporting duties, and submission to state inspections are required of federal facilities.

California Administrative Code, Sections 66001 through 67181 contains California's hazardous materials regulations.

California Code of Regulations Title 26 identifies wastes subject to regulations as hazardous wastes under this division and subject to the notification requirements of Health and Safety Code section 25153.6. It provides the criteria used by the California Department of Toxic Substances Control to identify characteristics of hazardous wastes, identifies characteristics of hazardous waste, and lists particular hazardous wastes. It includes sampling procedures and requires the use of the best available technology.

California Integrated Waste Management Act of 1989 specifies waste reduction mandates for municipal solid waste facilities. California Code of Regulations Title 27, Natural Resources, Integrated Waste Management, specifies guidelines for solid waste planning (including waste diversion goals), solid waste facilities permits, and regulations for daily operations of municipal solid waste landfills. Daily operations include regulations for daily and interim cover materials, and closure/post-closure plans.

The Porter-Cologne Water Quality Control Act protects all waters of the state for the use and enjoyment of the people of California and declares that the protection of water resources be administered by the regional water quality control boards with statewide coordination managed by the State Water Resources Control Board.

Recent State Assembly Bills In September 2004 Governor Arnold Schwarzenegger signed three assembly bills (AB) regulating discharges from "large passenger vessels," effectively cruise ships. AB 471 bans cruise ships from incinerating waste off California's coast. (AB 471 is now part of California Health and Safety code, Division 26, Part 2, Chapter 3.3, commencing with section 39630.) AB 2093 prohibits cruise ships from dumping sewage from kitchens, sinks, and showers (graywater) in state

waters. AB 2672 prohibits cruise ships from dumping sewage from toilets within three miles of shore. All three bills apply solely to California waters, which extend to 3 nmi offshore.

The California Clean Coast Act (California Public Resources Code sec. 72400 – 72442) took effect in January 2006 and addresses releases of sewage, sewage sludge, graywater, hazardous waste, other waste, or oily bilgewater into marine waters of the state (including state waters within a national marine sanctuary) from both large passenger vessels (cruise ships) and oceangoing ships. Section 72410 indicates that, "'Sewage' has the meaning set forth in section 775.5 of the Harbors and Navigation Code, including material that has been collected or treated through a marine sanitation device as that term is used in section 312 of the CWA (33 U.S.C. 1322) or material that is a byproduct of sewage treatment." Section 72410 also defines "large passenger vessel," "oceangoing ship," and "sufficient holding tank capacity," among other terms.

The act prohibits releasing the following:

- Graywater from large passenger vessels into marine waters of the state;
- Graywater from oceangoing ships with sufficient holding tank capacity into the marine waters of the state; and
- Hazardous waste, other waste, or oily bilgewater from large passenger vessels or oceangoing ships into the marine waters of the state or a marine sanctuary.

The act is intended to prohibit releasing the following:

- Sewage sludge from large passenger vessels and oceangoing ships into the marine waters of the state or a marine sanctuary;
- Sewage from oceangoing ships with sufficient holding tank capacity into the marine waters of the state; and
- Sewage from large passenger vessels into marine waters of the state.

Pursuant to section 1322(f) of the CWA, the State of California submitted an application to the U.S. EPA to prohibit the sewage and sewage sludge discharges from large passenger vessels and oceangoing ships within state waters. While California is awaiting approval of this application the California Clean Coast Act prohibitions on the release of sewage and sewage sludge discharges from large passenger vessels and oceangoing ships with sufficient holding tank capacity are not in effect.

The application of both the sewage and graywater discharge regulations only to those oceangoing ships with sufficient holding tank capacity is unavoidable due to the "innocent passage" clause in UNCLOS Article 21, and given that approximately 87% of the oceangoing ships transiting the California coastline are foreign-flagged (Santa Barbara County Air Pollution Control District 2007).

The California Clean Coast Act also states that the State Water Resources Control Board shall request the appropriate federal agencies to prohibit the release of sewage sludge and oily bilgewater (with exceptions for certain emergencies and vessels under innocent passage), and waste by large passenger vessels and oceangoing ships in all of the waters that are in the Channel Islands, Cordell Bank, Gulf of the Farallones, and Monterey Bay national marine sanctuaries (sec. 72440 (b) and sec. 72440.1).

5.3 PROTECTION OF SUBMERGED LANDS

Federal Law

Rivers and Harbors Act of 1899, 33 U.S.C. 401 *et seq.*

The Rivers and Harbors Act prohibits the unauthorized obstruction of navigable waters of the United States. The construction of any structure or the excavation or fill in the navigable waters of the United States is prohibited without a permit from the USACE. Section 13 of the Act also prohibits the discharge of refuse into navigable waters, but has been largely superseded by the CWA.

Wreck Act, 33 U.S.C. 409 *et seq.*

The Act prohibits the anchoring or tying of vessels or other craft in navigable channels in a manner that prevents or obstructs passage of other vessels or craft. Also, the act places a duty on an owner, lessee or operator of a vessel, raft or other craft that has sunk in a navigable channel to immediately mark the wreck with a buoy or beacon and to maintain such marker until the wreck is removed or abandoned. The owner, lessee, or operator has the duty to commence the immediate removal of the wreck.

(See also 5.1.1, above, for descriptions of the Submerged Lands Act and Outer Continental Shelf Lands Act)

5.4 NAVIGATION OF VESSELS

Federal Law

Carriage of Goods by Sea Act, 46 App. U.S.C. 1300–1315

The Carriage of Goods by Sea Act governs every bill of landing or similar document of title, which is evidence of a contract for the carriage of goods by sea to or from U.S. ports, in foreign trade. The Act provides for the duties and rights of the carrier, as well as the responsibilities and liabilities of the carrier and ship regarding, for example, seaworthiness, cargo and contents of a bill, as well as rights and immunities of the carrier and ship.

Harter Act, 46 App. U.S.C. 190–196

The act requires owners, masters or agents of any vessel transporting merchandise or property from or between United States ports and foreign ports to issue to shippers a bill of landing, or shipping document, stating, among other things, the number of packages, or quantity, condition of merchandise, and weight. Such document shall be *prima facie* evidence of receipt of the merchandise. It allows vessel owners limitation of liability for losses resulting from errors in navigation, dangers of sea and acts of God. Similar to the Carriage of Goods by Sea Act, except that the Harter Act: does not relieve the owner for errors in navigation if there was failure to exercise due diligence to provide a seaworthy vessel; has no statute of limitations; and does not provide a limit of liability for loss or damage of cargo.

Ports and Waterways Safety Act of 1972 (PWSA), 33 U.S.C. 1221–1236

The PWSA, as amended by the Port and Tanker Safety Act of 1978 (PTSA), P.L. 95–474, and the Oil Pollution Act of 1990, is designed to promote navigation, vessel safety, and protection of the marine environment. Generally, the PWSA applies in any port or place under the jurisdiction of the United States, or in any area covered by an international agreement negotiated pursuant to 33 CFR 2.05–30.

The PWSA authorizes the USCG to establish vessel traffic separation schemes (VTSSs) for ports, harbors, and other waters subject to congested vessel traffic. The VTSS apply to commercial ships, other than fishing vessels, weighing 300 gross tons (270 gross metric tons) or more. OPA amended the PWSA to mandate that appropriate vessels must comply with the VTSSs.

The PWSA was amended by the PTSA in 1978. Under the PTSA, Congress finds: that navigation and vessel safety and protection of the marine environment are matters of major national importance; that increased vessel traffic in the Nation's ports and waterways creates substantial hazard to life, property or the marine environment; that increased supervision of vessel and port operations is necessary in order to (1) reduce the possibility of vessel or cargo loss, or damage to life, property or the marine environment; (2) prevent damage to structures in, on, or immediately adjacent to the navigable waters of the United States or the resources within such waters; (3) insure that vessels operating in the navigable waters of the United States shall comply with all applicable standards and requirements for vessel construction, equipment, manning and operational procedures; and (4) insure that the handling of dangerous articles and substances on the structures in, on, or immediately adjacent to the navigable waters of the United States is conducted in accordance with established standards and requirements; and that advance planning is critical in determining proper and adequate protective measures for the Nation's ports and waterways and the marine environment, with continuing consultation with other federal agencies, state representatives, affected users and the general public, in the development and implementation of such measures.

The PTSA provides broader regulatory authority over regulated and non-regulated areas. The PTSA provides for improvements in the supervision and control of all types of vessels operating in navigable waters of the United States, and in the safety of foreign or domestic tank vessels that transport or transfer oil or hazardous cargoes in ports or places subject to United States jurisdiction. The PTSA also reflects certain tank vessel standards and requirements accepted internationally, specifically those developed by the International Conference on Tanker Safety and Pollution Prevention.

5.5 PROTECTION OF MARINE MAMMALS, SEABIRDS AND SEA TURTLES

Federal Law

Endangered Species Act of 1973 (ESA), 16 U.S.C. 1531–1544

The ESA protects species of plants and animals listed as threatened or endangered. The Secretary of the Interior and the Secretary of Commerce determine, through regulations, whether any species are endangered or threatened. The secretaries also are required to designate critical habitat and develop and implement recovery plans for threatened and endangered species. Federal agencies must ensure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of critical habitat.

The ESA prohibits the taking of any member of an endangered species. "Take" is defined broadly and includes harassment, harm, pursuit, hunting, shooting, wounding, killing, trapping, capturing, or collecting, or attempting to engage in any of this type of conduct. The requirements of the ESA are enforceable.

Fur Seal Act Amendments of 1983, 16 U.S.C. 1151–1175

The Fur Seal Act Amendments prohibit the taking of fur seals in the North Pacific Ocean, except as provided by the act. Indians, Aleuts, and Eskimos who dwell on the North Pacific Ocean may take fur seals for subsistence purposes. The Secretary of Commerce is responsible for regulating the taking of fur seals. The Amendments authorize a North Pacific Fur Seal Commission.

The Fur Seal Act Amendments also authorize the Secretary to administer the fur seal rookeries and other federal real and personal property on the Pribilof Islands.

Lacey Act Amendments of 1981, 16 U.S.C. 3371–3378

The Lacey Act prohibits domestic and international trafficking in and possession of protected fish, wildlife, and plants. It does so in two ways. First, it requires that most shipments of fish and wildlife moving in interstate or foreign commerce be accurately marked and labeled as to their contents. Second, the Lacey Act makes it unlawful to import, export, transport, sell, receive, acquire, or purchase fish, wildlife, and certain indigenous plants taken, possessed, transported, or sold in violation of state, federal, Indian tribal, or foreign laws or regulations that relate or refer to fish or wildlife or plants. Violators are subject to both criminal and civil sanctions. The prohibitions apply broadly to all wild animals, whether dead or alive, and to any part, product, egg, or offspring, including captive-bred animals, and more narrowly to certain wild plants indigenous to the United States.

Marine Mammal Protection Act of 1972 (MMPA), 16 U.S.C. 1361–1421h

The MMPA generally prohibits taking and importation of all marine mammals, except under limited exceptions. The MMPA gives the Secretary of Commerce authority and duties under the act for all cetaceans (whales, dolphins, and porpoises) and pinnipeds (seals and sea lions, except walruses), and it give authority for other species of marine mammals to the Secretary of the Interior. It requires the Secretary to prepare and periodically revise stock assessments of marine mammal stocks (MMPA section 117). It requires the Secretary to publish in the Federal Register and revise at least annually a list of commercial fisheries that categorizes the fisheries based on the incidence of serious injury and mortality of marine mammals (MMPA section 188(c)). For commercial fisheries categorized as Category I or II (frequent or occasional serious injury or mortality), the Secretary must grant an authorization to incidentally take marine mammals upon receipt of a completed registration form. The Secretary is to establish a program to monitor incidental mortality and serious injury of marine mammals during commercial fishing operations (MMPA section 188(d)), which it does through its observer program. The Secretary is to implement a take reduction plan through establishment of a take reduction team for certain "strategic" stocks of marine mammals that interact with Category I or II fisheries to reduce incidental mortality and serious injury of marine mammals from commercial fishing operations (MMPA section 188(f)).

Upon request, and after making certain findings, the Secretary is to authorize and prescribe regulations for incidental takes of small amounts of marine mammals (MMPA section 101(a)(5)(A)). In the same manner, the Secretary is to issue or deny permits for public display (and maintain an inventory of marine mammals possessed for public display), scientific research, enhancing the survival or recovery of a stock, and educational or commercial photography, after receipt of an application to take marine mammals for those purposes (MMPA section 104). If the Secretary receives a petition for a status review of the species (or on the Secretary's own initiative), the Secretary is to make a determination whether a species or stock is depleted or is no longer depleted. The Secretary is to prepare a conservation plan as soon as possible for any species of stock that the Secretary determines is depleted. (MMPA section 115). The Secretary is to enforce the provisions of Title I of the MMPA (MMPA section 107).

In consultation with the Secretary of the Interior, Marine Mammal Commission, and others, the Secretary of Commerce is to establish the Marine Mammal Health and Stranding Response Program, including issuing guidance for determining at what point a rehabilitated marine mammal is releasable to the wild and collecting, periodically updated, and making available information related to marine mammal health and strandings (MMPA sections 402 and 403). The Secretary is to establish a marine mammal unusual mortality event working group, issue a detailed contingency plan for responding to any unusual mortality event, designate Onsite Coordinators for unusual mortality events, and administer the Marine Mammal Unusual Mortality Event Fund (MMPA sections 404 and 405). The Secretary is to maintain a National Marine Mammal Tissue Band, issue guidance for tissue collection and analysis, and maintain a central database for tissue bank and database (MMPA section 407). The Secretary is to conduct the Prescott Marine Mammal Rescue Assistance Grant Program to provide grants to eligible stranding network participants (MMPA section 408).

The Secretary has several discretionary duties or areas for which duties can be delegated. The Secretary is to prescribe regulations deemed necessary and appropriate related to taking and importing marine mammals and to carry out the purposes of Title I, and the Secretary may develop conservation and management measures to alleviate impacts on strategic stocks in certain circumstances (MMPA sections 103, 112(a), and 112(e)). The Secretary may by agreement use other Federal agencies or may designate state officers for enforcement of Title I (MMPA sections 107 and 109(k)). If a state develops a program that meets statutory requirements for the conservation and management of species of marine mammals, the Secretary is to transfer management authority for the species to the state after certain findings and processes, although there are no states with such authority at this time (MMPA section 109).

Migratory Bird Treaty Act, 16 U.S.C. 703–715s

Under this act, it is unlawful "to pursue, hunt, take, capture, kill, attempt to take… offer for sale, sell, offer to purchase, purchase… any migratory bird… or any part, nest or egg" of any such bird protected by the Migratory Bird Convention, except as permitted by regulations. The Secretary of the Interior is charged with determining when and to what extent these activities may be permitted, and to create regulations for this purpose. Parties wishing to acquire permits for activities otherwise prohibited can do so by submitting an application and meeting specific conditions and requirements. The MBTA also allows for the establishment of fines for violations of provisions, including misdemeanor charges. In addition, states are given the authority to enact stricter regulations for the protection of migratory birds, providing that they are not in conflict with other existing Conventions.

Whaling Convention Act of 1949, 16 U.S.C. 916 – 916l

The Whaling Convention Act of 1949 implements the International Convention for the Regulation of Whaling, signed on December 2, 1946. The President appoints the United States Commissioner to the International Whaling Commission. The Secretary of Commerce is authorized to administer and enforce the act. The act prohibits persons subject to the jurisdiction of the United States to engage in whaling, or shipping, transporting, purchasing, selling, offering for sale, importing, exporting, or possessing whales in violation of the Convention or implementing regulations. The act also has provisions for enforcement of these regulations.

National Wildlife Refuge System, 16 U.S.C. 668dd

This section of law consolidates the authorities relating to the various categories of areas administered by the Secretary of the Interior for the conservation of fish and wildlife by designating all such areas part of the National Wildlife Refuge System (the System). The law prohibits knowingly disturbing, injuring,

cutting, burning, removing, destroying, or possessing any real or personal property of the United States, including natural growth, in any area of the system, or taking or possessing any fish, bird, mammal, or other wild animals within any such area without a permit. The Secretary may permit areas within the System to be used for hunting, fishing, and public recreation when the Secretary determines such uses are compatible with the major purposes for which such areas were established.

Another section of law, 16 U.S.C. 460k, recognizes the mounting public demands for recreational opportunities on areas administered by the Secretary of the Interior for fish and wildlife purposes, including areas within the System. This section provides that the Secretary may administer such areas as public recreation areas when the Secretary determines that public recreation is an appropriate incidental or secondary use. Such public recreation may be permitted only to the extent that it is not inconsistent with the primary objectives for which the particular area was established.

36 CFR Part 2, Resource Protection, Public Use and Recreation for the Channel Islands National Park

The National Park Service regulations generally prohibit possessing, destroying, injuring, defacing, removing, digging, or disturbing from its natural state living or dead wildlife or fish (or parts or products thereof), paleontological specimens, plants, and mineral resources and prohibits possessing or using a mineral or metal detector, magnetometer, side scan sonar, other metal detecting device or sub-bottom profiler.

State Law

California Endangered Species Act, Fish and Game Code 2050 *et seq*.

The California Endangered Species Act generally parallels the main provisions of the federal ESA and is administered by the CDFG. As stated in section 2052, it is the policy of CDFG to conserve, protect, restore, and enhance any endangered or threatened species and its habitat and it is the intent, consistent with conserving the species, to acquire lands for habitat for these species. Under section 2053, projects as proposed should not be approved if they jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of habitat essential to the continued existence of the species, if there are feasible alternatives available consistent with conserving the species or its habitat that would prevent jeopardy. In the event that a particular condition makes these alternatives infeasible, individual projects may be approved if they provide appropriate mitigation and enhancement measures.

5.6 PROTECTION OF HISTORICAL/CULTURAL RESOURCES IN THE MARINE ENVIRONMENT

Federal Law

Abandoned Shipwreck Act (ASA), 43 U.S.C. 2101 *et seq.*

The Abandoned Shipwreck Act asserts United States title to shipwrecks embedded in state submerged lands and transfers title to the state, except when the wreck is located on public or Indian land, or is a U.S. warship that has not been affirmatively abandoned. The public is given notice of the location of any shipwreck when title is asserted under the act.

Pursuant to the act, states manage a broad range of living and nonliving resources in their waters and submerged lands. Shipwrecks protected under the act offer recreational and educational opportunities for

divers, tourists, users of biological sanctuaries, and historical researchers. States are encouraged to provide public access to the shipwrecks through the adoption of guidelines for the creation of underwater parks.

The Secretary of the Interior, through the National Park Service, publishes guidelines to maximize the enhancement of shipwrecks as cultural resources; foster a partnership among sport divers, salvors, and other interests to manage shipwreck resources; facilitate access and utilization of the shipwrecks; and recognize the interests of groups engaged in shipwreck discovery and salvage.

Antiquities Act of 1906, 16 U.S.C. 431 *et seq.*

The Antiquities Act has two main components: (1) a criminal enforcement component, which provides for the prosecution of persons who appropriate, excavate, injure, or destroy any historic or prehistoric ruin or monument, or any object of antiquity on lands owned or controlled by the United States; and (2) a component that authorizes, through the issuance of a permit, the examination of ruins, the excavation of archeological sites, and the gathering of objects of antiquity on lands owned or controlled by the United States.

The Antiquities Act has been applied in the marine environment. Where the United States has ownership or control of the submerged lands in or on which submerged cultural resources are located, the Antiquities Act permitting provision can be used to regulate salvage. It appears, however, that its reach may be limited to regulating salvage only in marine protected areas in which the United States has the authority to protect submerged cultural resources.

Archaeological Resources Protection Act of 1979 (ARPA), 16 U.S.C. 470aa *et seq.*

ARPA is another historic preservation statute that has been applied to the marine environment. ARPA was specifically designed to prevent looting and destruction of archeological resources. Like the Antiquities Act, ARPA has both an enforcement and a permitting component. The enforcement provision provides for the imposition of both criminal and civil penalties against violators of the act. ARPA's permitting component allows for the recovery of certain artifacts consistent with the standards and requirements of the Federal Archeological Program. While ARPA is applicable to the marine environment, its reach in this context is limited. Pursuant to the express language of the act itself, ARPA can only be applied to such areas as national parks (with federally-owned submerged lands) and wildlife refuges. The definition of public lands expressly excludes the outer continental shelf (*i.e.*, federal exclusion or reservations under the Submerged Lands Act).

The purpose of this act is to secure, for the present and future benefit of the American people, the protection of archaeological resources and sites which are on public lands and Indian lands, and to foster increased cooperation and exchange of information between governmental authorities, and professional archaeological community, and private individuals having collections of archaeological resources and data which were obtained before October 31, 1979.

National Marine Sanctuary program-wide regulations provide that "management of historical resources under the National Marine Sanctuaries Act shall be consistent, to the extent practicable, with the Federal Archeological Program by consulting the Uniform Regulations, ARPA (43 CFR part 7) and other relevant Federal regulations" (15 CFR 922.2(e)).

National Historic Preservation Act (NHPA), 16 U.S.C. 470 *et seq.*

NHPA is the largest piece of federal historic preservation legislation. It has two major components that affect the responsibilities of federal agencies managing submerged lands. First, under section 106 of NHPA, federal agencies are to consider the effects of their undertakings (including the issuance of permits, the expenditure of federal funding and federal projects) on historic resources that are either eligible for listing or are listed on the National Register of Historic Places. Section 110 of NHPA imposes another obligation on federal agencies that own or control historic resources. Under this section, federal agencies must consider historic preservation of historic resources as part of their management responsibilities.

36 CFR Part 2, Resource Protection, Public Use and Recreation for the Channel Islands National Park

The National Park Service regulations generally prohibit possessing, destroying, injuring, defacing, removing, digging, or disturbing from its natural state living or dead wildlife or fish (or parts or products thereof), paleontological specimens, plants, and mineral resources and prohibits possessing or using a mineral or metal detector, magnetometer, side scan sonar, other metal detecting device or sub-bottom profiler.

Executive Order Number 11593 (1971)

This presidential order extended the protections of the National Historic Preservation Act of 1966 to all properties eligible for inclusion on the National Register of Historic Places and charged the federal agencies providing funds for any project to insure that such protections are afforded.

State Law

California's Native American Resource Protection Act of 2003, Chapter 1.76, Public Resources Code, Section 5097.993-5097.994

This act was approved by Governor Davis on September 30, 2002. A summary of the bill's provisions and applicability is as follows:

- Any person who illegally excavates, destroys, injures, or defaces a Native American historic, cultural, or sacred site, including any historic or prehistoric ruins, any burial ground, any archaeological or historic site, any inscriptions made by Native Americans at such a site, any archaeological or historic Native American rock art, or any archaeological or historic feature of a Native American historic, cultural, or sacred site is guilty of a misdemeanor;

- The archaeological or historic site should be listed, or may be eligible for listing, in the California Register of Historic Resources pursuant to section 5024.1;

- Pertains to public and private land;

- Punishable by imprisonment in a county jail up to one year, by a fine not to exceed ten thousand dollars ($10,000), or by both that fine and imprisonment;

- Each person who commits this violation is also subject to a civil penalty not to exceed fifty thousand dollars ($50,000) per violation;

- In determining the civil penalty amount, the court takes into account the extent of the damage to the resource and may consider the commercial or archaeological value of the resource involved and the cost to restore and repair the resource;

- Civil action may be brought by the district attorney, the city attorney, or the Attorney General, or by the Attorney General upon a complaint by the Native American Heritage Commission; and

- All monies collected from civil penalties as a result of an enforcement action brought by a city or county, or by the Attorney General for the Native American Heritage Commission, are first utilized to repair or restore the damaged site, and the remaining monies shall be available to that city or county or Attorney General to offset incurred costs.

Title 14 California Administration Code, Section 630(a)(1), General Regulations for Ecological Reserves

No person shall mine or disturb geological formations or archaeological artifacts, or take or disturb any bird, or nests or eggs thereof, or any plant, mammal, fish, mollusk, crustacean, amphibian, reptile, or any other form of plant or animal life except at provided in subsections 630.0 (a)(2) and (a)(8). CDFG may implement enhancement and protective measures to assure proper utilization and maintenance of ecological reserves.

5.7 INTRODUCED SPECIES IN THE MARINE ENVIRONMENT

Federal Regulations

Nonindigenous Aquatic Nuisance Prevention and Control Act, 16 U.S.C. 4701 *et seq.*

The Nonindigenous Aquatic Nuisance Prevention and Control Act, directs the Secretary of the department that houses the USCG (currently the Department of Homeland Security) to issue regulations to prevent the introduction and spread of aquatic nuisance species into the Great Lakes through ballast water. These regulations are to be issued in consultation with the Aquatic Nuisance Task Force, composed, inter alia, of the Under Secretary of Commerce for Oceans and Atmosphere, the Director of the USFWS, the Administrator of the U.S. EPA, the Commandant of the USCG, and the Assistant Secretary of Army (Civil Works). Civil and criminal penalties are available for regulatory violations.

The act also requires the task force to implement a prevention, monitoring and control program for aquatic nuisance species in U.S. waters. States can develop comprehensive aquatic nuisance species management plans, which can be implemented with federal grants and financial assistance if the plans are approved by the task force or the Assistant Secretary of the Army (Civil Works).

The act further requires the Departments of Defense and Transportation (now applies to the Department of Homeland Security with regard to USCG vessels) to implement ballast water management programs for seagoing DoD and USCG vessels to minimize risk of introduction of non-indigenous species from releases of ballast water. The act also requires the Departments of the Interior and Commerce to conduct a ballast water management demonstration program to demonstrate preventive technologies and practices.

Carriage of Animals, 46 U.S.C. 3901–3902, provides authority for the Secretary of Agriculture to prescribe regulations governing the accommodations for the export of animals, and provides for penalties for violations of such regulations.

Lacey Act Amendments of 1981, 16 U.S.C. 3371-3378, (see also description above under section 5.5) prohibits domestic and international trafficking in and possession of protected fish, wildlife, and plants.

36 CFR Part 2, Resource Protection, Public Use and Recreation for the Channel Islands National Park

National Park Service Regulations in effect at Channel Islands National Park (boundaries of which include San Miguel and Prince Islands, Santa Rosa, Santa Cruz, Anacapa and Santa Barbara Islands, including the rocks, islets, submerged lands, and waters within one nautical mile of each island, 16 U.S.C. 410(ff)) prohibit introducing wildlife, fish or plants, including their reproductive bodies, into a park area ecosystem (36 CFR 2.1(a)(2)).

State Law

Title 14 CCR 671.1 Importation, Transportation and Possession of Live Restricted Animals.

Provides for the California Department of Fish and Game to issue permits, with conditions, to import, export, transport, maintain, dispose of, or use for any purpose any animal otherwise restricted by regulation, including transgenic aquatic animals.

California Fish and Game Code 15007 prohibits spawning, incubating or cultivating transgenic and exotic species (as defined in the section) in California marine waters (0 to 3 nmi offshore).

5.8 OPERATION OF MOTORIZED PERSONAL WATERCRAFT

Federal Law

36 CFR 3.9, Regulation of Personal Watercraft

National Park Service regulations prohibit personal watercraft use in units of the National Park system, including the waters of the Channel Islands National Park.

5.9 OTHER FEDERAL AND STATE LAWS

There are other existing applicable federal and state laws that do not fall within the nine regulatory categories listed above. They are listed below under the following five sub-categories:

- Sustainability or Sustainable Development of Biological Resources;
- Marine Environmental Quality;
- Tourism and Recreation;
- U.S. Marine Transportation;
- Lightering; and
- Cross-cutting Federal Law.

5.9.1 Sustainability or Sustainable Development of Biological Resources

Federal Law

Anadromous Fish Conservation Act, 16 U.S.C. 757a–757g

The Anadromous Fish Conservation Act provides authority to enter into cooperative agreements to conserve, develop, and enhance anadromous fish resources, including conducting research and investigations, stream clearances, and constructing and maintaining devices to assist with feeding, spawning, and migration. The act authorizes the Secretary of the Interior to enter into cooperative agreements with one or more states for the purpose of conserving, developing, and enhancing anadromous fish resources and the fish in the Great Lakes and Lake Champlain that ascend streams to spawn.

Control or Elimination of Jellyfish or Sea Nettles, 16 U.S.C. 1201–1205

The Secretary of Commerce is authorized to cooperate with, and provide assistance to, the states in controlling and eliminating jellyfish and other such pests and in conducting research for the purposes of controlling floating seaweed. Congress also consents to any compact or agreement between any two or more states for the purpose of carrying out a program of research, study, investigation, and control of jellyfish and other such pests in the coastal waters of the United States.

Driftnet Impact Monitoring, Assessment and Control Act, 16 U.S.C. 1822 note

The Secretary of Commerce, through the Secretary of State is required to seek to secure international agreements to implement an international ban on large-scale driftnet fishing. The Secretary of Commerce, after consultation with the Secretary of State and the Secretary of the department in which the Coast Guard is operating (currently the Department of Homeland Security), must submit a periodic report to Congress describing the steps taken to carry out the act. If the Secretary of Commerce determines that such driftnet fishing "diminishes the effectiveness" of an international fishery conservation program, or if the Secretary of Commerce or the Interior determines that such driftnet fishing results in taking which "diminishes the effectiveness" of any international program for endangered or threatened species, the Secretary making such finding shall certify such fact to the President pursuant to the Pelly Amendment, 22 U.S.C. 1978.

Eastern Pacific Tuna Licensing Act of 1984, 16 U.S.C. 972–972h

The Eastern Pacific Tuna Licensing Act of 1984 implements the Eastern Pacific Ocean Tuna Fishing Agreement, signed in San Jose, Costa Rica, on March 15, 1983. The Secretary of State is authorized to act on behalf of the United States and appoint a United States representative to the representative body. The Secretary of Commerce, in cooperation with the Secretary of State and the Secretary of the department in which the Coast Guard is operating, promulgates necessary regulations. The act provides for enforcement of the act and its implementing regulations.

Fish and Wildlife Act of 1956 and associated provisions, 16 U.S.C. 742a–742d, 742e–742j, 742k, 744–748, 750–753, 753a–753b, 754, 758–758d, 760a–760g.

The Fish and Wildlife Act of 1956, among other things, authorizes NOAA's National Marine Fisheries Service (NMFS) to conduct investigations and prepare and disseminate information and reports regarding fish and their habitats in order to provide for the proposed development of fish resources.

Fish and Wildlife Coordination Act, 16 U.S.C. 661–666c

The Fish and Wildlife Coordination Act requires that wildlife conservation receive equal consideration with other features of water-resource development. The act requires that federal permitting and licensing agencies consult with NMFS and the USFWS before issuing a permit or license for activities that modify any body of water. NMFS provides comments and recommendations to prevent loss of, and damage to, fish populations and their habitats.

Magnuson-Stevens Fishery Conservation and Management Act, 16 U.S.C. 1801–1883

Under the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA), the United States claimed sovereign rights and exclusive fishery management authority over all fish, and all Continental Shelf fishery resources, within the EEZ. The MSFCMA establishes a procedure for authorizing foreign fishing and prohibits unauthorized foreign fishing within the EEZ.

The MSFCMA establishes national standards for fishery conservation and management within the EEZ. The FCMA established eight Regional Fishery Management Councils each composed of the principal state official with fishery management responsibility, the relevant regional administrator of NMFS, and individuals appointed by the Secretary of Commerce who are knowledgeable regarding the conservation and management, or the commercial or recreational harvest, of the fishery resources of the geographical area concerned. The Councils are responsible for preparing and amending fishery management plans for each fishery under their authority that requires conservation and management.

Fishery management plans describe the fisheries and contain necessary and appropriate conservation and management measures, applicable to foreign fishing and fishing by vessels of the United States. The plans are submitted to the Secretary of Commerce for approval. If approved, the Secretary of Commerce promulgates implementing regulations. The Secretary of Commerce may prepare Secretarial fishery management plans if the appropriate council fails to develop such a plan. The MSFCMA also provides for enforcement of the act.

The National Aquaculture Act of 1980, 16 U.S.C. 2801–2810

The purpose of the National Aquaculture Act of 1980 is to promote aquaculture in the United States. The secretaries of Agriculture, Commerce, and the Interior are required to establish and periodically amend a National Aquaculture Development Plan. The secretaries are required to submit a biennial report to Congress that contains a description and evaluation of the actions undertaken with respect to the plan. The secretaries are to provide information and assistance on aquaculture activities.

The National Fishing Enhancement Act of 1984 (Artificial Reefs), 16 U.S.C. 1220, 33 U.S.C. 2101 *et seq.*

The National Fishing Enhancement Act was enacted to promote and facilitate the establishment of artificial reefs. The Secretary of Commerce, in consultation with secretaries of the Interior and Defense, the Secretary of the Department in which the Coast Guard is operating, the Administrator of the Environmental Protection Agency, Regional Fishery Management Councils, States, Interstate Fishery Commissions and individuals, shall develop and publish a long-term plan which must include geographic, hydrographic, biological, ecological, social, economic, design, material, and other criteria for artificial reef construction; mechanism for monitoring compliance with permit requirements and managing use of the reefs; synopsis of existing information on artificial reefs and needs for further research; and an evaluation of alternatives for facilitating transfer of artificial reef construction materials to person holding permits.

The Secretary of the Army will issue permits for construction of artificial reefs and will notify the Secretary of Commerce of any need to deviate from the Commerce long-term plan.

5.9.2 Marine Environmental Quality

Federal Law

Clean Air Act (CAA), 42 U.S.C. 7401 *et seq.*

The CAA is divided into six principal subchapters. Subchapter I addresses air pollution from stationary sources and requirements for states to develop plans to meet health-based standards. (Also, subchapters IV-A, V, and VI deal with specific stationary source programs.) Part A of subchapter I contains the basic provisions to control air pollution from stationary sources. Based on statutory criteria, the U.S. EPA is required to list criteria pollutants and, for each such pollutant, establish primary and secondary National Ambient Air Quality Standards (NAAQSs). Each state (or U.S. EPA, if the state declines) must submit to U.S. EPA a state implementation plan with individual emission limitations and procedures to ensure timely attainment of the NAAQSs for each air quality region within the state.

Part A also includes, among other things, key specialized stationary source programs. For example, U.S. EPA must adopt emission standards for categories of hazardous air pollutants (HAPs) in accordance with a specified schedule. (HAPs are listed in the statute.) Section 112(m) of the CAA directs U.S. EPA, in cooperation with the NOAA, to assess the extent of atmospheric deposition of HAPs (and, in the discretion of U.S. EPA, other air pollutants) to the Great Lakes, Chesapeake Bay, Lake Champlain and coastal waters (defined, for purposes of the subsection, as estuaries under the National Estuary Program and National Estuarine Research Reserves). The assessment program is to, among other things, establish a monitoring network, investigate sources and deposition rates, evaluate any adverse effects to public health or the environment, and assess the contribution of such deposition to violations of water quality standards established pursuant to the Clean Water Act. U.S. EPA is to submit biennial reports to Congress on the matter and issue a determination as to whether the other provisions of section 112 are adequate to prevent serious adverse effects to public health and serious or widespread environmental effects associated with HAP deposition. If U.S. EPA determines that the authorities of section 112 are not adequate, the agency is directed to promulgate such further emission standards or control measures under section 112 as may be necessary and appropriate.

Part B of Subchapter I is repealed; Part C addresses the "prevention of significant deterioration" program, designed to limit the deterioration of air quality in regions with air cleaner than the minimum federal air quality standards. Part D addresses plan requirements for non-attainment areas.

Subchapter II addresses emission standards for moving sources. Subchapter III addresses administration and enforcement. Amendments to Subchapter III made in 1990 require U.S. EPA, following consultation with the Department of the Interior and the U.S. Coast Guard, to establish regulatory requirements to control air pollution from OCS sources (except in the Gulf of Mexico, over which the Department of the Interior has jurisdiction). Subchapter IV-A addresses acid deposition. This subchapter was added in 1990 to reduce emissions of pollutants, primarily sulfur dioxide and nitrogen dioxide, leading to the formation of acid precipitation. Subchapter V addresses permits, requiring each state to submit to U.S. EPA for approval a permit program covering basically every pollution source subject to the CAA. If a state fails to submit and implement an approved program, U.S. EPA is to step in. Subchapter VI addresses stratospheric ozone depletion. The CAA also establishes a great waters program, which looks specifically at the impacts of air deposition of nutrients and toxics in coastal waters.

Coastal Zone Management Act of 1972 (CZMA), 16 U.S.C. 1451 *et seq.*

The CZMA strives to preserve and protect coastal zone resources. Also, through the CZMA, states are encouraged to develop coastal zone management programs (CZMPs) that allow economic growth compatible with the protection of natural resources, the reduction of coastal hazards, the improvement of water quality, and sensible coastal development. The CZMA provides financial and technical incentives for coastal states to manage their coastal zones consistent with CZMA standards and goals.

State coastal zones include the coastal waters and adjacent shorelands that extend inland to the extent necessary to control shorelands, the use of which have a direct and significant impact on coastal waters and to control those geographical areas likely to be affected by or vulnerable to sea level rise. For federal approval, a CZMP must: (1) identify the coastal zone boundaries; (2) define the permissible land and water uses within the coastal zone that have a direct and significant impact and identify the state's legal authority to regulate these uses; (3) inventory and designate areas of particular concern; (4) provide a planning process for energy facilities; (5) establish a planning process to control and decrease shoreline erosion; and (6) facilitate effective coordination and consultation between regional, state, and local agencies. NOAA grants the requisite federal approvals for CZMPs and oversees subsequent implementation of the programs.

A state with a federally approved CZMP is eligible for financial assistance and gains a legal mechanism to control federal permits and activities that affect the state's coastal zone. Federal agency activities that affect any land or water use or natural resource of the coastal zone must be consistent to the maximum extent practicable with the enforceable policies of the state CZMP. Federally licensed or permitted activities that affect any land or water use or natural resource of the coastal zone must be consistent with the enforceable policies of the CZMP. The Secretary, however, can override a state's determination of inconsistency if the Secretary finds that the federally licensed or permitted activity is consistent with the objectives of the CZMA or is otherwise necessary in the interest of national security.

The CZMA establishes the National Estuarine Research Reserve System (NERR). States may seek Federal approval and designation of certain areas as NERRs if the areas qualify as biogeographic and typological representations of estuarine ecosystems and are suitable for long-term research and conservation. Once an area is designated as a NERR, federal financial assistance is available for acquisition of property and management, research, and education related to the NERR.

See also section 6217 of the Coastal Zone Act Reauthorization Amendments of 1990.

National Coastal Monitoring Act, 33 U.S.C. 2801 *et seq.*

The National Coastal Monitoring Act, also known as title V of the Marine Protection, Research, and Sanctuaries Act of 1972, provides joint authority for the U.S. EPA and NOAA to establish a comprehensive national program for consistent monitoring of the nation's coastal ecosystems. The act provides that the program is to include, but is not limited to: identification and analysis of the status of environmental quality in the nation's coastal ecosystems (including, but not limited to, assessment of ambient water quality, benthic environmental quality, and health and quality of living resources); identification of sources of environmental degradation affecting the nation's coastal ecosystems; assessment of the impact of governmental programs and management strategies and measures designed to abate or prevent the environmental degradation of the nation's coastal ecosystems; assessment of the accumulation of floatables along coastal shorelines; analysis of short-term and long-term trends in the environmental quality of the nation's coastal ecosystems; and the development and implementation of intensive coastal water quality monitoring programs (after designation of intensive coastal monitoring areas).

National Contaminated Sediment Assessment and Management Act, 33 U.S.C. 1271

Section 1271 of the National Contaminated Sediment Assessment and Management Act requires the U.S. EPA, in consultation with NOAA and the Department of the Army, to conduct a comprehensive national survey of data regarding sediment quality and a continuing program to assess such quality.

National Environmental Policy Act of 1969 (NEPA), 42 U.S.C. 4321 *et seq.*

NEPA requires, among other things, that for every major federal action significantly affecting the quality of the human environment, the agency prepare a detailed statement regarding:

> (i) the environmental impact of the proposed action; (ii) any adverse environmental effects that cannot be avoided should the proposal be implemented; (iii) alternatives to the proposed action; (iv) the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity; and (v) any irreversible and irretrievable commitments of resources that would be involved in the proposed action should it be implemented.

This document is called an EIS. It is, in essence, a detailed discussion of the environmental consequences of a given proposed agency action, and it must be made available to the agency decision-maker on the matter, the public, and other agencies.

Under the regulations implementing NEPA, a document called an environmental assessment is used to determine whether a federal action rises to the level of a "major federal action significantly affecting the quality of the human environment," thus triggering the requirement to prepare an EIS. Based on the environmental assessment, if an action does not rise to that level, a Finding of No Significant Impact is made.

Title IV of the Marine Protection, Research, and Sanctuaries Act of 1972, 16 U.S.C. 1447a to 1447f

The purpose of Title IV of the Marine Protection, Research, and Sanctuaries Act of 1972, is to establish regional research programs, under effective federal oversight, to: (1) set priorities for regional marine and coastal research in support of efforts to safeguard the water quality and ecosystem health of each region; and (2) carry out such research through grants and improved coordination. The regions are: the Gulf of Maine, greater New York bight, mid-Atlantic, South Atlantic, Gulf of Mexico, California, North Pacific, Alaska, and insular Pacific.

Specifically, a regional marine research board is to be established for each region, consisting of eleven members -- three appointed by NOAA, two by the U.S. EPA, and six by governors of states located within the region. Each board is to develop and submit to NOAA and U.S. EPA for approval a comprehensive marine research plan for the region, to be updated at least every four years. Each board is also to: (1) provide a forum for coordinating research among research institutions and agencies, (2) provide for review and comment on its research plan by affected users and interests, (3) ensure that the highest quality of research projects will be conducted to carry out the plan, and (4) prepare, for transmittal to Congress by NOAA and U.S. EPA, a periodic report on the marine environmental research issues and activities within the region.

Each marine research plan is to include: (1) an overview of the environmental quality conditions in the coastal and marine waters of the region and expected trends in these conditions; (2) a comprehensive inventory and description of all marine research related to water quality and ecosystem health expected to be conducted during the four-year term of the plan; (3) a statement and explanation of the marine research

needs and priorities applicable to the marine and coastal waters of the region over the upcoming ten-year period with emphasis on the upcoming three-to-five-year period; (4) an assessment of how the plan will incorporate existing marine, coastal, and estuarine research and management in the region; and (5) a general description of marine research and monitoring objectives and timetables for achievement through the funding of projects under this title so as to meet the priorities specified in the plan in accordance with item (3) above.

Each board may annually submit a grant application to NOAA to fund projects aimed at achieving the research priorities set forth in the relevant research plan. The title provides that the boards shall cease to exist on October 1, 1999, unless extended by Congress. Authorization of appropriations for the title expired at the end of fiscal year 1996.

Water Resources Development acts, 33 U.S.C. 2280 *et seq.*, *inter alia*

Among other things related to the USACE, the implementing regulations for the Water Resources Development acts require mitigation for damages to fish and wildlife resources resulting from water resource projects.

State Law

California Coastal Zone Management Program, as amended January 1988 (California Public Resources Code, Division 20—California Coastal Act), and the establishment therein of the California Coastal Zone, have been approved by NOAA. This gives the California Coastal Commission consistency authority over coastal projects undertaken by federal agencies.

The California Coastal Commission implements the policies of the California Coastal Act. According to section 30236, any substantial alteration of rivers or streams shall incorporate the best mitigation measures feasible, and be limited to one of three things: flood control projects where no other method for protecting existing structures in the floodplain is feasible and where such protection is necessary for public safety or to protect existing development. This act also requires protecting environmentally sensitive habitat against any significant disruption of habitat values; only uses dependent on those resources are allowed within those areas (section 30240a).

The Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65) deals with chemicals and substances determined by California to cause cancer or reproductive toxicity. The regulations and a list of chemicals/substances involved are published in Division 2 of Title 22 beginning with section 12000 of the CCR. It is also published in Title 26, which contains the regulations on toxic substances.

5.9.3 Tourism and Recreation

Federal Law

National Park Service Organic Act, 16 U.S.C. 1, *et seq.*

This act creates the National Park Service (NPS) in the Department of the Interior. The NPS is charged with promoting and regulating the use of federal areas known as national parks, monuments, and reservations. Such areas are established by Congress through specific legislation.

5.9.4 United States Marine Transportation

Federal Law

Coast and Geodetic Survey Act, 33 U.S.C. 883a–k

The Secretary of Commerce is authorized to conduct hydrographic and topographic surveys, tide and current observations, geodetic-control surveys, field surveys for aeronautical charts, and geomagnetic, seismological, gravity, and related geophysical measurements to provide nautical and aeronautical charts and other information for safe marine and air navigation. Also, these charts and information have commercial and industrial uses and fulfill engineering and scientific purposes. This information is collected, assimilated, and distributed by NOAA under its authority in the act.

International Regulations for Preventing Collisions at Sea, (72 COLREGS), 33 U.S.C. 1051- 1053, 1061-1094

The International Regulations for Preventing Collisions at Sea provides binding comprehensive regulations for the prevention of collisions on the water. The 72 COLREGS apply beyond established demarcation lines. In the United States, the 72 COLREGS govern ship navigation on non-internal waters. The scope of the 72 COLREGS include Steering and Sailing Rules, *e.g.*, conduct of vessels in sight of one another, conduct of vessels in restricted visibility; Lights and Shapes, and Sound and Light Signals. The statute also contains special provisions for ships of war, vessels proceeding under convoy, and fishing vessels engaged in fishing as a fleet. Civil penalties may be assessed for violations of the 72 COLREGS.

46 U.S.C.

Title 46 of the United States Code is integral to maritime transportation as it comprehensively addresses shipping. Title 46 is broken down into three general subtitles:

(I) General; (II) Vessels and Seamen; and (III) Maritime Liability. Subtitle II contains laws governing vessels, cargo and passengers including, for example, laws pertaining to design and construction of vessels, vessel manning and pilotage, and carriage of cargo or passengers.

Part B (Chapters 31 through 47) provides authority and responsibility for the inspection and regulation of vessels by the USCG. Part B specifies vessels subject to inspection and inspection procedures, as well as vessels exempt from inspection.

3201-3205: Management of Vessels; requires the Secretary to prescribe regulations which establish a safety management system addressing, for example, safety and environmental protection, and procedures for safe operation of vessels in compliance with U.S. and international law, for responsible vessels and persons subject to the chapter. The Secretary is to issue Safety Management Certificates and a Document of Compliance to requesters complying with safety management plans.

4301-4311: Recreational Vessels; contains the laws applicable to recreational vessels. The Secretary is authorized to issue regulations establishing, for example, minimum safety and equipment standards (section 4302; regulations are found in 19 CFR, 33 CFR, 46 CFR). The chapter expressly preempts state law establishment of a recreational vessel or associated equipment performance or other safety standard that is not identical to regulations under section 4302 (section 4306).

Interstate Commerce Act, 49 U.S.C. 10101 *et seq.*, *inter alia*

The Interstate Commerce Act provides for the regulation of rates and services of competing interstate carriers. Part B (chapters 131–149) addresses water carriers, defined as a person providing water transportation for compensation (section 13102(22)). The transportation policy of part B is to "ensure the development, coordination, and preservation of a transportation system that meets the transportation needs of the United States." In overseeing the modes of transportation, the United States will, among other things, recognize and preserve the inherent advantage of each mode of transportation; promote safe, adequate, economical, and efficient transportation; encourage the establishment and maintenance of reasonable rates for transportation, without unreasonable discrimination or unfair or destructive competitive practices; and in overseeing transportation by water carrier, to encourage and promote service and price competition in the noncontiguous domestic trade (section 13101). The Secretary and the Surface Transportation Board (formerly the Interstate Commerce Commission) have jurisdiction over transportation by water carrier section 13521).

Intermodal Surface Transportation Efficiency Act of 1991, P.L. 102–240, *inter alia*

The purpose of the act is to develop a national surface transportation system that is economically efficient and environmentally sound, provides the foundation for a global economy, and that will move people and goods in an energy efficient manner. The act provides that the system will consist of all forms of transportation in a unified, interconnected manner, including transportation systems of the future, to reduce energy and air pollution while promoting economic development and supporting the national preeminent position in interstate commerce.

Merchant Marine Acts (Merchant Marine Act of 1920, 46 U.S.C. 861, *inter alia*; Merchant Marine Act of 1928, 46 U.S.C. 866, *inter alia*; Merchant Marine Act of 1936, 46 U.S.C. 1101, *inter alia*)

The Merchant Marine Acts sought to promote the continued development of the American Merchant Marine. The purpose as stated in the Act of 1920 is that it is necessary for the national defense and proper growth of foreign and domestic commerce that the United States shall have a merchant marine of the best equipped and most suitable types of vessels sufficient to carry the greater portion of its commerce and serve as a naval or military auxiliary in time of war or national emergency, ultimately to be owned by U.S. citizens (section 861). The Act of 1928 provided the Secretary of Transportation authority to remodel and improve the fleet. The Act of 1936 sought to foster continued development and maintenance of the merchant marine. The Act also prevents unjust discrimination by carriers.

Shipping Acts (Shipping Act of 1916, 46 U.S.C. 801 *et seq.*; Shipping Act of 1984, 46 App. U.S.C. 1701–1720, *inter alia*)

The Shipping Acts are intended to establish a non-discriminatory regulatory process for the common carriage of goods by water in the commerce of the United States. The Shipping Acts were modeled on the Interstate Commerce Act. The Act of 1916 governs transportation by water of passengers and property on the high seas or Great Lakes between states, territories, districts or possessions. Carriers are required to establish and file "joint and reasonable rates" with the Federal Maritime Commission. The Act of 1984 governs foreign commerce (repealing provisions of the Act of 1916 re: foreign commerce), and has as its purposes: to establish a non–discriminatory regulatory process for the common carriage of goods by water in foreign commerce of the United States; to provide efficient and economic transportation system in the ocean commerce of the United States, that is responsive and in harmony to international shipping practices; and to encourage development of an economically sound and efficient United States flag liner fleet capable of meeting national security needs. The act allows ocean carriers the right to establish intermodal or through rates in agreements that must be filed with the Federal Maritime Commission.

Admiralty Extension Act (AEA), 46 U.S.C. 740

The AEA expressly defines the scope of admiralty and maritime jurisdiction of the United States. Such jurisdiction included all cases of damage or injury to person or property, caused by a vessel on navigable water, notwithstanding that such damage or injury be done or consummated on land. Suits under the AEA may be brought *in rem* or *in personam*. However, the AEA provides that any suit brought against the U.S. under the Public Vessels Act (see below) or Suits in Admiralty Act (see below) shall constitute the exclusive remedy, for all suits not otherwise filed under the Federal Torts Claim Act. The AEA was enacted to eliminate the confusion over the lines between land and water, *e.g.*, those cases where persons or property on land was damaged by ships.

Public Vessels Act, (PVA), 46 U.S.C. 781–790

The PVA provides authority for bringing an admiralty cause of action against the United States for damages caused by U.S. public vessels. Thus, the PVA waives sovereign immunity by the United States in cases involving public vessels. Public vessel is not defined in the PVA, but case law provides direction. The PVA contains provisions for the venue of suits brought thereunder, counterclaims, suits by nationals of foreign governments, and exemptions and limitations of liability. The PVA also expressly provides it shall not be construed to recognize the existence of or as creating a lien against any United States public vessel.

Suits in Admiralty Act (SAA), 46 U.S.C. 741–752

The SAA provides the authority to bring admiralty suits against the United States. Such suits may be brought *in personam*, and no United States vessel or cargo may be seized under the SAA. If a suit is brought under the SAA, it is the exclusive remedy available to a claimant. The SAA provides a statute of limitations (2 years) after the cause of action arises. The United States is entitled to all exemptions and all limitations of liability accorded by law to owners, charterers, operators or agents of vessels. The SAA also provides procedures in the event a vessel within the scope of the SAA is seized by foreign jurisdictions. The SAA authorizes arbitration, compromise, or settlement of claims. The SAA also provides that a crew of a United State vessel may recover compensation for salvage services. Finally, any money recovered by a suit brought by the United States shall be deposited in the U.S. Treasury to the credit of the department having control of the vessel or cargo with respect to such cause of action.

5.9.5 Lightering

Federal Law

33 CFR Part 156: Oil and Hazardous Material Transfer Operations These regulations provide comprehensive requirements for all oil transfer operations. The regulations provide requirements that address such matters as: the designated person in charge of transfer operations, advance notice to the Coast Guard about planned transfer operations, certain conditions and equipment requirements that must be met before the transfer operations may begin, communications between all parties involved in the transfer, discharge containment and reporting procedures, transfer monitoring equipment, procedures for discharge cleanup, procedures regarding the declaration of inspection that must be completed prior to transfer operations, required and prohibited conduct by personnel during the transfer operation, and equipment tests and inspections. The regulations also provide certain requirements that apply specifically to lightering operations, such as: 24 hour advance "pre-arrival" notices of plans to conduct lightering and detailed and comprehensive information about the vessels involved and the planned lightering operation; 72 hour advance notice of the need for Tank Vessel Examinations (where appropriate); immediate

reporting if fire, explosion, collision, grounding or any similar emergency, which poses a threat to the vessels involved, occurs during lightering; and reporting on any discharge that occurs during lightering operations. The regulations also provide the requirements and procedures for designating lightering zones and explain that in geographic areas in which lightering zones have been designated, no lightering may occur outside of the designated zones. To date four lightering zones have been designated in the U.S. and all four are located within the Gulf of Mexico.

State Law

Title 14, California Code of Regulations 840 – 845.2 California regulations provide comprehensive requirements for all oil transfer operations within or that may have an effect on marine waters of the State. The regulations stipulate that no vessel may transfer cargo oil upon marine waters of the State where the cargo oil is to be lightered, unless the vessel meets all of the general oil transfer requirements, both the transfer and receiving vessel have on board certain certificates/letters and an International Oil Pollution Prevention certificate (or equivalent) at the time of transfer. The general regulations provide requirements at every phase of lightering operations: pre-transfer, during transfer, and following transfer operations. The regulations require that: certain conditions be met in order for transfer operations to occur, communications be maintained between parties involved in the transfer, certain containment and response equipment and spill cleanup equipment, reports, and designation of and qualifications for parties in charge of transfer operations.

5.9.6 Cross-cutting Federal Law

Federal Law

National Marine Sanctuaries Act (NMSA), 16 U.S.C. 1431 *et seq.,* also known as title III of the Marine Protection, Research, and Sanctuaries Act of 1972. The NMSA provides the Secretary of Commerce with the authority to designate and manage marine areas of special national significance as National Marine Sanctuaries. The NMSA lists conservation, recreational, ecological, historical, cultural, archeological, scientific, educational, and esthetic as qualities that might give an area special national significance.

The NMSA's purposes and policies include comprehensive and coordinated conservation and management; maintaining natural biological communities and, where appropriate, restoring and enhancing natural habitats, populations, and ecological processes; enhancing public awareness, understanding and appreciation of the marine environment; and facilitating, to the extent compatible with the primary objective of resource protection, all public and private uses of resources not prohibited pursuant to other authorities.

Among the factors the Secretary must consider in determining whether an area merits designation as a National Marine Sanctuary are present and potential uses of the area that depend on maintenance of the area's resources, including commercial and recreational fishing, other commercial and recreational activities, and research and education and the public benefits to be derived from sanctuary status, with emphasis on the benefits of long-term protection of nationally significant resources, vital habitats, and resources which generate tourism.

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6.0 REFERENCES

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7.0 PERSONS AND AGENCIES CONTACTED

Agencies and Elected Officials Receiving Consultation Letters, May 2003

United States Senate
The Honorable Barbara Boxer
The Honorable Diane Feinstein

United States House of Representatives
The Honorable Lois Capps
The Honorable Elton Gallegly

Federal Committees
Senate Committee on Commerce, Science, and Transportation
The Honorable Ernest F. Hollings, Chair (former)

House Resources Committee
The Honorable Richard Pombo, Chair

Department of Energy
Andrew C. Lawrence
Deputy Assistant Secretary, Office of Environmental Policy and Guidance

Department of Transportation
Sean B. O'Hollaren
Assistant Secretary for Governmental Affairs (former)

Federal Aviation Administration
Patricia G. Smith, Associate Administrator
Office of Commercial Space Transportation

Department of the Interior
Dr. Willie R. Taylor, Director
Office of Environmental Policy and Compliance

U.S. Fish and Wildlife Service
Anne Badgley
Regional Director, Pacific Region (former)

Minerals Management Service
J. Lisle Reed
Regional Director, Pacific OCS Region

National Park Service
John J. Reynolds
Director, Pacific West Region (former)

Channel Islands National Park
Terry Hofstra
Acting Superintendent (former)

Environmental Protection Agency
Diane Regas
Director, Office of Ocean, Wetlands, and Watersheds

Department of State
Mary Beth West
Deputy Assistant Secretary for Oceans and Fisheries (former)

Department of Defense
John Paul Woodley, Jr.
Assistant Deputy Under Secretary for Defense for Environment (former)

US Navy
Donald Schregardus
Deputy Assistant Secretary of the Navy (Environment)

US Air Force
Maureen T. Koetz,
Deputy Assistant Secretary of the Air Force
(Environment, Safety and Occupational Health)

National Aeronautics and Space Administration
Olga Dominguez
Director, Environmental Management Division (former)

Ames Research Center (NASA)
G. Scott Hubbard, Center Director

United States Coast Guard
Admiral Ryan Stumpp
Commander, 11th Coast Guard District (former)

Commander J.E. Frost
Chief, Law Enforcement Division
11th Coast Guard District

NOAA-National Marine Fisheries Service
Dr. Rebecca Lent, Deputy Assistant Administrator (former)

NOAA National Environmental Satellite, Data, and Information Service
Gregory W. Withee
Assistant Administrator

NOAA National Environmental Satellite, Data, and Information Service
Michael Mignogno
Polar Operational Satellite Program Manager

Pacific Fishery Management Council
Dr. Donald McIsaac
Executive Director

California Resources Agency
Mary D. Nichols, Secretary (former)

CA Department of Fish and Game
Robert C. Hight, Director (former)

CA Department of Water Resources
Thomas M. Hannigan, Director (former)

CA State Lands Commission
Paul D. Thayer, Executive Officer

CA Fish and Game Commission
Robert Treanor, Executive Director

CA Department of Boating & Waterways
Raynor T. Tsuneyoshi, Director

CA Department of Conservation
Darryl W. Young, Director

California Coastal Commission
Peter Douglas, Executive Director

Governor, State of California
The Honorable Gray Davis (former)

California EPA
Winston Hickox, Secretary (former)

California State Water Resources Control Board
Arthur G. Baggett, Jr., Chair

Ventura County Executive Office
John F. Johnston, Executive Officer

County of Ventura Harbor Dept.
Lyn Krieger, Department Director

County of Santa Barbara
Naomi Schwartz
Chair, Board of Supervisors (former)

Rob Almy
Water Agency Manager

Dianne Meester
Assistant Director, Planning and Development

Municipal Entities
City of Santa Barbara
Mayor Marty Blum

City of Santa Barbara
John N. Bridley, Waterfront Director

City of Santa Barbara
Mick Kronman, Harbor Operations Manager

Ventura Port District
Oscar Peña, General Manager

Port of Hueneme/Oxnard Harbor District
William J. Buenger, Executive Director

Sanctuary Advisory Council Representatives/Affiliations, 1999-2004

Agosta, William – Agosta International Marine
Ainsworth, Jack – California Coastal Commission
Akins, Leah – California Resources Agency
Auerbach, Jeff – Jewish League of Environmental Awareness
Baird, Brian – California Resources Agency
Baker, Monica – Island Packers, Inc.
Baker, Lauri – Hotel Sales and Marketing, Santa Barbara
Barminski, Joan – Minerals Management Service
Barsky, Kristine – California Department of Fish and Game
Adam, Birst – U.S. Coast Guard
Brodie, Alex – Island Packers, Inc.
Brumbaugh, Dan – American Museum of Natural History
Brye, Jim – Ventura Yacht Club
Cabugos, Paulette – Chumash Maritime Association
Caesar, Darren – Talbot/Caesar and Seider Insurance Services, LLC
Cahn, Matthew – California State University, Northridge
Campbell, Jackie – Santa Barbara County
Clark, Jon – Wendy P. McCaw Foundation
Cordero, Roberta – Chumash Maritime Association
Cousteau, Jean-Michel – Ocean Futures Society
Daily, Marla – Santa Cruz Island Foundation
Davis, Gary – National Park Service
deWet-Oleson, Kathy – Ocean videographer, Ventura CA
Dow, Ron – U.S. Navy
Duncan, Robert – Paine Webber
Dunn, W. Scott – Adventours Outdoor Excursions
Dusette, Don – Channel Islands Pipeline, Inc.
Enriquez, Lyle – National Marine Fisheries Service
Fahy, Christina – National Marine Fisheries Service
Finucan, Michael – Hornet Sportfishing
Fitzgerald, Jack – Channel Islands National Park

Fusaro, Craig – Joint Oil/Fisheries Liaison Office
Galipeau, Russell – Channel Islands National Park
Gibbs, Tony – Islands Magazine
Glaser, Warren – Naturalist, Ventura CA
Graves, Yuri – U.S. Coast Guard
Grifman, Phyllis – Sea Grant, university of Southern California
Gross, Jorge – California Department of Fish and Game
Guerra, Avie – Oxnard, CA
Hamerski, Michael – U.S. Coast Guard
Hanrahan, Michael – The Ocean Channel, Inc.
Helms, Greg – The Ocean Conservancy
Helvey, Mark – National Marine Fisheries Service
Hoeflinger, Chris – Ventura County Commercial Fishermen's Association
Holt, Richard – Ventura, CA
Hooper, Eric – Commercial Fisherman, Ventura CA
Howorth, Peter – Marine Mammal Center, Santa Barbara CA
Johnson, Korie – National Marine Fisheries Service
Kendig, Bill – Sport Chalet, Ventura CA
Kett, Eric – Sea Zen Marine Consulting (former)
Knowlton, Jim – Ocean Futures Society
Krieger, Lyn – Ventura County Harbor Department
Kronman, Mick – Santa Barbara Harbor
Krop, Linda – Environmental Defense Center
LaCorte, Barbara – Hope School, Santa Barbara
Liquornik, Harry – Commercial Fishermen of Santa Barbara, Inc.
Lohuis, Holly – Ocean Futures
Long, Dave – Cabrillo High School
Lum, Matthew – MJL Advisors, Inc.
Luzader, John – U.S. Coast Guard
Manson, Larry – Ventura College
Marshall, Jim – Commercial Fisherman, Santa Barbara CA
Mayerson, Drew – Minerals Management Service
McCrea, Merit – SeaHawk Sportfishing Charters (former), Santa Barbara CA
Meester, Dianne – Santa Barbara County
Melendez, Ricardo – Candelaria American Indian Council
Mertes, Leal – University of California, Geography Department
Miller, Chris – California Lobster and Trap Fishermen's Association
Miller-Henson, Melissa – California Resources Agency
Peveler, Jack – Ventura County Harbor Department
Piltz, Fred – Minerals Management Service
Pringle, Gail – U.S. Navy
Rentz, Troy – U.S. Coast Guard
Roberson, Stephen – Graves, Roberson & Bourassa
Roth, Rebecca – California Coastal Commission
Russell, J. Wade – U.S. Coast Guard
Schobel, Walt – U.S. Air Force
Schuyler, Jr., Arent H. – Santa Barbara Maritime Museum
Scott, Rudy – Jordanos, Inc.
Secord, Dan S – Santa Barbara City Council
Setnicka, Tim – National Park Service (former)
Shevock, Jim – National Park Service

Sorrell, Rick – U.S. Coast Guard
Spicer, William – Western Gate Publishing
Steele, Bruce – Commercial Fisherman, Santa Barbara CA
Stone, Alex – U.S. Navy
Taylor, Craig – Santa Barbara, CA
Timm, Gary – California Coastal Commission
Ugoretz, John – California Department of Fish and Game
Vojkovich, Marija – California Department of Fish and Game
Warner, Robert – University of California, Department of Ecology, Evolution, & Marine Biology
Webber, Jeanette – Santa Barbara Hotel Group
Wick, Tonya – National Marine Fisheries Service
Wolf, Patricia – California Department of Fish and Game (former)

Sanctuary Advisory Council Working Groups consulted, 1999-2004

Sanctuary Education Team
Conservation Working Group
Commercial Fishing Working Group
Recreational Fishing Working Group
Military Working Group
Ports and Harbors Working Group

Persons and Agencies Contacted for development of the 2008 Supplemental Draft Environmental Impact Statement

California Coastal Commission
Peter Douglas, Executive Director
Mark Delaplaine, Federal Consistency Supervisor
Cassidy Teufel, Coastal Program Analyst

California State Lands Commission
Nicole Dobroski, Environmental Scientist

California State Water Resources Control Board
Dominic Gregorio, Senior Environmental Scientist,
Chief, Ocean Standards Unit, Stormwater Section, Division of Water Quality

Phillip Isorena, Senior Water Resource Control Engineer,
Chief, NPDES Unit, Regulatory Section, Division of Water Quality

Renan Jauregui, Water Resource Control Engineer,
NPDES Unit, Regulatory Section, Division of Water Quality

Kim Ward, Environmental Scientist,
Ocean Standards Unit, Stormwater Section, Division of Water Quality

City of Santa Barbara
Brian Slagle, Administration/Administrative Analyst, Waterfront Department

Department of the Interior
National Park Service
Jack Fitzgerald, Chief Ranger, Channel Islands National Park

Marine Exchange of Southern California
Captain Manfred H.K. (Manny) Aschemeyer, Executive Director
Captain Dick McKenna, Deputy Executive Director

U.S. Coast Guard
CWO3 Michael S. Young, Sr. Marine Inspector, Lead Marine Investigator,
Marine Safety Detachment, Santa Barbara, California

U.S. Environmental Protection Agency
Ginette Chapman, Office of Regional Counsel, Region IX
Allan Ota, Ocean Disposal Coordinator, Ocean Dumping Program, Region IX

8.0 LIST OF PREPARERS

Armor, John. Legislative, Regulatory, and NEPA Coordinator, NOAA Office of National Marine Sanctuaries
B.S., 1997, Marine Science, University of South Carolina
M.S., 2006, Environmental Science and Policy, Johns Hopkins University
Years of Experience: 6

Bates, Michelle, Biologist/Environmental Scientist, Tetra Tech, Inc.
B.S., 1997, Biology, Pepperdine University, California
M.E.S.M., 2000, Environmental Science and Management, University of California, Santa Barbara
Years of Experience: 5

Bioregional Planning Associates (BPA), Consultant

Brookhart, Matt. Policy Coordinator, West Coast Region NOAA National Marine Sanctuary Program
B.A., 1993, History, Seattle University
M.A., 1996, Asian Studies/Environmental History, University of Oregon
M.A., 1999, Environmental Policy, Monterey Institute of International Studies
Years of Experience: 7

Collinson, Thomas B., Vice President, Tetra Tech, Inc.
B.A., 1978, Geology, University of California, Berkeley
M.A., 1986, Geology, University of California, Santa Barbara
Years of Experience: 20

De Wit, Leray (Ray) A., Consultant
B.A., 1968, Biology, San Jose State University, California
M.A., 1973, Biology, San Jose State University, California
Years of Experience: 28

Eldridge, Jacqueline C., Publications Manager, Tetra Tech, Inc.
B.S., 1971, Biology, Fairleigh Dickinson University, Teaneck, New Jersey
M.S., 1978, Marine Science, Long Island University, Greenvale, New York
M.B.A., 1983, Business Administration, National University, Vista, California
Years of Experience: 26

Elliott, Brandon C., Word Processor I, Tetra Tech, Inc.
Computer Science, Santa Barbara City College, California
Years of Experience: 1

Emery, Angela D., Associate Environmental Scientist, Tetra Tech, Inc.
B.S., 1998, Environmental Studies (concentration Biology), University of California, Santa Barbara
Years of Experience: 1

Engle, John M., PhD
B.A., 1971, Shippensburg State University, Shippensburg, Pennsylvania
Ph.D., 1979, University of Southern California, Los Angeles, California

Years of Experience: 33

Green, Alice V., Marine Resources Specialist, Tetra Tech, Inc.
B.A., 1976, Biology (concentration Marine Biology), University of Pennsylvania, Philadelphia
M.S., 1978, Management (concentration Marine Resources Management), Texas A&M University, College Station
Years of Experience: 17

Henry, Michael. Policy Research Assistant, NOAA Channel Islands National Marine Sanctuary
B.S., 2001, Aquatic Biology, University of California Santa Barbara
Ph.D., 2007, Ecological Physiology/Invertebrate Zoology, University of California Santa Barbara
Years of Experience: 8

Howorth, Peter, Consultant
Principal Investigator, Marine Mammal Consulting Group
Years of Experience: 35

Ige, Geri K., Senior Graphic Designer, Tetra Tech, Inc.
Fine Arts, University of California, Irvine
Years of Experience: 19

Jacobsen, Amy S., Intern, Tetra Tech, Inc.
B.A., 2000, Environmental Studies with Geography Emphasis, University of California, Santa Barbara
Years of Experience: 1

Kefauver, Kathleen, Senior Biologist, Tetra Tech, Inc.
B.A., 1987, Biological Sciences, University of California, Santa Barbara
Years of Experience: 16

Kinsfather, Sarah, Management Plan Specialist, Channel Islands National Marine Sanctuary
B.A., 1997, Environmental, Population, and Organismic Biology, University of Colorado, Boulder
B.A., 1997, Cultural Anthropology, University of Colorado, Boulder
Master of Marine Affairs, 2002, Marine Resource Management, and Policy, University of Washington, School of Marine Affairs
Years of Experience: 9

Kronman, Mick, Consultant
B.A., 1972, Political Science, UC Santa Barbara
Formerly: Pacific Bureau Chief at National Fisherman Magazine, and Commercial fisherman
Years of Experience: 36

Leeworthy, Bob, NOAA, National Ocean Service, Special Projects
Leader, Coastal and Ocean Resource Economics Program
B.S., 1975, Economics, Florida State University
M.S., 1984, Economics, Florida State University
Ph.D., 1990, Economics, Florida State University

Lum, Luanne, Environmental Scientist, Tetra Tech, Inc.
B.A., 1985, Environmental Design and Planning, University of Colorado
Years of Experience: 13

Mobley, Chris. Superintendent, NOAA Channel Islands National Marine Sanctuary
B.A., 1984, Biology, Dartmouth College
M.S., 1987, Oceanography, University of Washington
M.B.A., 1999, Sonoma State University
Years of Experience: 19

Murray, Michael. Deputy Superintendent, Management Plan Coordinator, NOAA Channel Islands National Marine Sanctuary
B.S., 1988, Business Administration, California State University Long Beach
M.S., 1997, Environmental Studies (Policy and Planning), California State University Fullerton
Years of Experience: 12

Randall, Diane, Senior GIS Specialist, Tetra Tech, Inc.
Technical Certificate, Computer Programming, Sawyers College, Ventura, California
Technical Certificate, Program Management, Moorpark College, California
Years of Experience: 12

Rigby, Mark C., Ph.D., Consultant
B.A., 1993, Biological Sciences, University of California, Santa Barbara
M.Sc., 1996, Biological Sciences, University of Alberta, Edmonton
Ph.D., 1999, Experimental Ecology, Swiss Federal Institute of Technology in Zurich (ETHZ)
Years of Experience: 7

Scalliet, Helene. Program Specialist, NOAA Office of National Marine Sanctuaries
B.S., 2001, Aquatic Biology, University of California, Santa Barbara
M.E.S.M., 2004, Coastal and Marine Resources Management, Donald Bren School of Environmental Science and Management, University of California, Santa Barbara
Years of Experience: 5

Schwemmer, Robert, West Coast Regional Maritime Heritage Coordinator, NOAA Office of National Marine Sanctuaries
Years of Experience: 26

Senyk, Natalie. Science Advisor, NOAA Channel Islands National Marine Sanctuary
B.S., 2000, Environmental Science, Rutgers University
M.S., 2006 Marine Science, University of California, Santa Barbara
Years of Experience: 5

Walton, Anne, Management Plan Specialist, Channel Islands National Marine Sanctuary
Masters in Education, 1981, University of Kentucky
M.S., 1997, Marine Affairs, University of Washington

Warren, Shirley, Word Processor III, Tetra Tech, Inc.
B.A., 1992, Environmental Studies, CSU Sacramento, California
Minor: Geology
Years of Experience: 9

Wiley, Peter, NOAA, National Ocean Service, Special Projects
Economist, Coastal and Ocean Resource Economics Program
B.A., 1986, Economics, St. Mary's College of Maryland

M.A., 1999, Economics, The George Washington University

Wilson, Michelle, Project Manager, Tetra Tech

B.A., 1993, Environmental Science (concentration in Biology), University of California, Berkeley

Minor: Resource Management

Years of Experience: 12

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9.0 ACRONYMS AND ABBREVIATIONS

AB	Assembly Bill
AEA	Admiralty Extension Act
AFB	Air Force Base
AIS	automatic identification system
APPS	Act to Prevent Pollution from Ships
ARPA	Archaeological Resources Protection Act
ASA	Abandoned Shipwreck Act
ASBS	Area of Special Biological Significance
ATBA	area to be avoided
B.P.	before present
C	Celsius
CAA	Clean Air Act
CalCOFI	California Cooperative Oceanic Fisheries Investigations
CCA	California Clean Coast Act
CCR	California Code of Regulations
CDFG	California Department of Fish and Game
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CINMS	Channel Islands National Marine Sanctuary
CINP	Channel Islands National Park
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CLIA	Cruise Line Industry Association, Inc.
CMAR	Coastal Maritime Archaeology Resources
COLREGS	International Regulations for Preventing Collisions at Sea
CSLC	California State Lands Commission
CWA	Clean Water Act (*also known as Federal Water Pollution Control Act*)
CZARA	Coastal Zone Act Reauthorization Amendments
CZMA	Coastal Zone Management Act
CZMP	Coastal Zone Management Plan
DEIS	Draft Environmental Impact Statement
DHSA	Death on the High Seas Act
DMP	Draft Management Plan
DWRRA	Deep Water Royalty Relief Act
EA	Environmental Assessment
EEZ	exclusive economic zone
EIS	environmental impact statement (*NEPA*)
ESA	Endangered Species Act (*Federal*)
FEIS	Final Environmental Impact Statement
FMA	Flood Mitigation Assistance
FMP	Final Management Plan
FSRU	Floating storage and regasification unit
FWPCA	Federal Water Pollution Control Act

GAO	Government Accountability Office
GIS	geographic information system
GRT	gross registered tons
HAP	hazardous air pollutant
ICBM	intercontinental ballistic missile
IMO	International Maritime Organization
LCP	Local Coastal Program
MARPOL	International Convention for the Prevention of Pollution from Ships
MBNMS	Monterey Bay National Marine Sanctuary
MBTA	Migratory Bird Treaty Act
MHR	Maritime Heritage Resource
ml/L	milliliter(s) per liter
MLPA	Marine Life Protection Act
MMPA	Marine Mammal Protection Act
MMS	Minerals Management Service
MOCZM	Massachusetts Office of Coastal Zone Management
mph	miles per hour
MPWC	motorized personal watercraft
MRWG	Marine Reserves Working Group
MSD	marine sanitation device
N	North
NAAQS	National Ambient Air Quality Standards (*CAA*)
NAWCWP	Naval Air Warfare Center Weapons Division
NBVC	Naval Base Ventura County
NCCOS	National Centers for Coastal Ocean Science
NEPA	National Environmental Policy Act (*Federal; 1969*)
NERR	National Estuarine Research Reserve System
NFIRA	National Flood Insurance Reform Act
NFMP	Nearshore Fishery Management Plan
NHPA	National Historic Preservation Act
NIH	National Institutes of Health
NMFS	National Marine Fisheries Service
nmi	nautical mile(s)
NMSA	National Marine Sanctuaries Act
NMSP	National Marine Sanctuary Program
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent
NO_X	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System (*CWA*)
NPS	nonpoint source
NRC	National Research Council
OCIMF	Oil Companies International Marine Forum
OCS	Outer Continental Shelf

OCSLA	Outer Continental Shelf Lands Act
ONMS	Office of National Marine Sanctuaries
OPA	Oil Pollution Act of 1990
OPR	Office of Protected Resources
OSPR	Office of Oil Spill Prevention and Response
OTEC	Ocean Thermal Energy Conversion
PCB	polychlorinated biphenyl
PFMC	Pacific Fishery Management Council
PISCO	Partnership for Interdisciplinary Study of Coastal Oceans
P.L.	public law
PTSA	Port and Tanker Safety Act
PVA	Public Vessel Act
PWSA	Ports and Waterways Safety Act
ROG	reactive organic gas
RWQCB	Regional Water Quality Control Board
SAA	Suits in Admiralty Act
SAC	Sanctuary Advisory Council
Sanctuary	Channel Islands National Marine Sanctuary
SAMSAP	Sanctuary Aerial Monitoring and Spatial Analysis Program
SAR	search and rescue
SBCAPCD	Santa Barbara County Air Pollution Control District
SCAB	South Coast Air Basin
SCB	Southern California Bight
SCCWRP	Southern California Coastal Water Research Project
SCR	submerged cultural resource
SDEIS	Supplemental Draft Environmental Impact Statement
SEIS	Supplemental Environmental Impact Statement
SLC	(California) State Lands Commission
SMBRP	Santa Monica Bay Restoration Project
SO	Southern Oscillation
SST	sea surface temperature
STBL	ship to be lightered
SWQPA	State Water Quality Protection Area
SWRCB	State Water Resources Control Board *(California)*
TEU	twenty-foot equivalent units
TSG	treated sewage or graywater
TSS	Traffic Separation Scheme
UNCLOS	United Nations Convention on the Law of the Sea
USACE	U.S. Army Corps of Engineers
U.S.C.	United States Code
USCG	U.S. Coast Guard
U.S. EPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
VTSS	Vessel Traffic Separation Scheme

W	West
WCOOA	West Coast Offshore Operating Area
WDR	Waste Discharge Requirement
WSPA	Western States Petroleum Association

10.0 GLOSSARY OF TERMS

Adaptive management. A process in which actions or a set of actions are taken, the effects of these actions are evaluated in terms of achieving overall goals, the actions are modified if they are not achieving the intended results, and information from early efforts is used to guide later efforts.

Adverse impact. A negative effect.

Aesthetic. Having to do with the outward appearance or visual properties. Especially used to describe preferable features.

Alternative actions. A reasonable range of options which can accomplish the objectives of a Proposed Action; for example, alternative locations for the proposed action. Under NEPA, the alternatives are analyzed in the same depth as the proposed action in an EIS to provide a thorough comparison. In addition, a no action alternative should be included in environmental impact analysis. See also National Environmental Policy Act, Proposed Action.

Ambient. Surrounding.

Anthropogenic. Of or relating to the influence of human beings on nature.

Artifact. A man-made object taken as a whole.

Attainment. As it pertains to air quality regulation, conforming to local air quality standards.

Avifauna. Zoology. Birds of a region or area.

Ballast water. Water confined in specially designed compartments in a vessel's hull that serves to stabilize the vessel.

Baseline conditions. The environmental conditions that exist before a proposed action is implemented. The baseline is used in environmental impact analysis to define the environment that may be impacted due to a proposed action.

Bilge water. Water accumulated in the bottom of a ship.

Biodegradable effluents. Water, bait, and other matter that are discharged and will naturally break down over time.

Biogeographical. Of or relating to the geographic distribution of plants and animals.

Biological Assessment. Under the ESA, each federal agency proposing an action that may affect a listed species is required to conduct an assessment on the species in applying for an exemption to the act (16 U.S.C. 1536).

Bioprospecting. Biology. The activity of seeking a useful application, process, or product from nature. In many cases, bioprospecting is a search for useful organic compounds in microorganisms, plants, and fungi (NPS 2003a).

Bottom trawl. A type of fishing gear consisting of a cone or funnel-shaped net that is towed or drawn along the seafloor.

Chumash. Contemporary Native Californians whose ancestors occupied the Santa Barbara Channel Islands and mainland, from north of Morro Bay near San Luis Obispo to Malibu Canyon along the coast, and inland to the western edge of the San Joaquin Valley (Grant 1978). This encompassed all of present-day San Luis Obispo, Santa Barbara, and Ventura counties, as well as parts of Kern and Los Angeles counties and included the Northern Channel Islands.

Coastal Consistency Determination. A determination of consistency by a federal agency given to the California Coastal Commission for projects in the coastal zone or affecting any land or water use or natural resource of the coastal zone. Not all projects in the coastal zone require a Coastal Consistency Determination; this is regulated by the California Coastal Commission. See also coastal zone, consultation, significant impacts.

Coastal zone (California). A zone designation established by the California Coastal Commission under the CZMA. The coastal zone is determined by a number of factors, including habitat values and public access issues.

Commensurate. Having the same quantity, measure, or value as another.

Conservation. Improvement by virtue of preventing loss or injury or other change.

Consultation. A formal meeting process with the lead agency and other federal regulatory agencies to involve other agencies in the preparation of environmental documentation. Some consultations are required under law, such as USFWS or NOAA consultation under section 7 of the ESA. See also lead agency.

Context. Under NEPA, the setting of the proposed action. The significance must be based on several contexts: society as a whole, the affected region, the affected interests, and the locality (Bass and Herson 1993). See also National Environmental Policy Act, significant impact.

Consumer surplus. The amount that a person is willing to pay for a good or service over and above what he actually has to pay for a good or service. The value received is a surplus or net benefit. In the case of natural resources, for which there is no owner and a price cannot be charged for use of the resources, consumer's surplus is referred to as a nonmarket economic value since the goods and services from the natural resources are not traded in markets.

Cooperating agency. Under NEPA, an agency, other than the lead agency, that has jurisdiction over or expertise with a particular proposed action and therefore provides input to the lead agency during the environmental impact analysis. See also lead agency, National Environmental Policy Act.

Critical habitat. Under the ESA, areas within the geographical area occupied by a listed species on which are found those physical or biological features essential to the conservation of the species and which may require special management considerations or protection. Critical habitat is determined by the Secretary of the Interior or Secretary of Commerce when an endangered species is listed and may also include areas outside the geographical area occupied by a listed species that the Secretary determines to be essential for the conservation of the species (16 U.S.C. 1532). See also endangered species, Endangered Species Act.

Cumulative impact or effect. An impact that is a result of an incremental impact of an action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

Diurnal. Pertaining to the day; occurring each day. Zoology: Being active (*i.e.*, hunting, feeding, breeding) primarily during the day.

Dredging. The process of scooping or digging out sediment to deepen a channel bed.

El Niño. A Pacific weather pattern that occurs every decade, on average, causing warmer ocean temperatures and more rainfall.

Ecological. Biology. Characterized by the interdependence of living organisms in an environment.

Economic impact. Measures the economic importance of a use of resources in terms of expenditures made while undertaking an activity and the associated direct, indirect, and induced effects (multiplier impacts) on sales/output, income and employment (sometimes tax revenues are also included here) in local, regional, and national economies. The measurements used here are often referred to as market economic values because they are the measurements observed in actual transactions in an economy.

Economic rent. A return on investment over and above a normal rate of return on investment. A normal rate of return on investment is the rate of return in which incentives are such that capital will neither outflow or inflow into an industry. This is a special form of producer's surplus.

Economic value. This term generally refers to net economic values such as consumer's surplus, producer's surplus, or a special form of producer's surplus—economic rents (above normal returns to investment). The term also generally refers to the class of economic values called nonmarket economic values because this portion of economic value is not captured in market data.

Ecosystem. Biology. A system created by a community of organisms with their physical environment.

Effluent. A material or other matter flowing outward.

Endangered species. Biology. Under the ESA, any species that is in danger of extinction throughout all or a significant portion of its range other than a species of the Class Insecta determined by the Secretary of the Interior to constitute a pest whose protection under the provisions of the ESA would present an overwhelming and overriding risk to humans (16 U.S.C. 1532). See also Endangered Species Act.

Endemic. Native, belonging to a particular region.

Environmental Assessment (EA). Under NEPA, a preliminary environmental document prepared by a lead agency for a proposed action that is not considered eligible for a categorical exclusion. The EA determines whether the proposed action would have a significant impact on the environment. If a potentially significant impact is identified, the lead agency must prepare an EIS, which is the next step in the NEPA impact analysis process. See also Environmental Impact Statement, lead agency, National Environmental Policy Act, significant impact.

Environmental Impact Statement (EIS). An environmental document under NEPA that is required for federal actions that have a significant impact on some aspect of the human environment. An EIS contains a description of the proposed action and alternatives, the baseline environment that may be affected by the action, and the impacts associated with the action or alternatives. Also included are mitigation measures designed to reduce impacts to a less than significant level. See also Environmental Assessment, lead agency, National Environmental Policy Act, significant impact.

Environmentally preferable. Products or services that are undertaken in way that reduces the impacts on the environment. For example, recycled paper reduces the need for natural resources (*i.e.*, trees) and reduces waste being disposed of in a landfill.

Estuarine. Botany. A wetland area occurring near an estuary (waterway where the tide meets a river current).

Evolutionarily Significant Unit (ESU). Conservation biology. A population of a species that is reproductively isolated from other population units within the species and represents an important component in the evolutionary legacy of the species.

Fauna. Biology. Wildlife.

Feasible. Practical, able to be accomplished successfully.

Field, oil. The surface area overlying an oil reservoir or reservoirs. The term usually includes not only the surface area, but also the reservoir, the wells, and the production equipment. A single field may include several reservoirs separated either horizontally or vertically.

Flora. Biology. Plant life.

Geomorphology. The study of the evolution and configuration of landforms.

Hazardous materials. Substances that, because of their quantity, concentration, or physical, chemical, or infectious characteristics, would present substantial danger to public health and welfare or to the environment when released.

Hazardous wastes. Hazardous materials that are no longer usable or intended for use. See also hazardous materials.

Holocene. Geology. A geologic time period of the latter part of the Quaternary Period, extending from the end of the Pleistocene to the present. See also Pleistocene.

Hydrocarbon. Organic compounds consisting of only oxygen, hydrogen, and carbon atoms that are the main components of petroleum products.

Hydrologic. Pertaining to the study of water.

Impact. An effect.

Incidental take. Under the ESA, take that is a result of, but not the purpose of, carrying out an otherwise lawful federal action. An "incidental take permit" may be granted by the Secretary of the Interior or Commerce to a federal agency that has prepared a conservation plan that specifies the impacts associated with the taking, mitigation measures to reduce the impacts, and alternatives to the proposed action. See also endangered species, take.

Infeasible. Impractical, unable to be successfully undertaken.

Intensity. Under NEPA, the severity of an impact, based on such factors as beneficial effects, public health, unique characteristics, degree of controversy, degree of unique or unknown risk, precedent-setting

effects, cumulative effects, presence of cultural or historical resources, or presence of special-status species. See also National Environmental Policy Act, significant impact.

Intertidal zone. The zone of marine habitat that is part of the littoral zone above the low-tide mark.

Jurisdiction. The right and power to interpret and apply the law.

Lead agency. The agency or agencies that have taken the primary responsibility for preparing the environmental impact statement for a proposed action under NEPA.

Lightering. At sea transfer of petroleum-based products, materials, or other matter from vessel to vessel.

Listed species. Biology. Under the ESA, either an endangered or a threatened species. See also endangered species, Endangered Species Act, threatened species.

Lithic. Geology. Consisting of or relating to stone or rock.

Long-term impact. An impact lasting for an unspecified or extended period of time.

Mano. A tool, such as a stone or roller, that is used for grinding grains or seeds.

Marine sanitation device. Any equipment on board a vessel that is designed to receive, retain, treat, or discharge sewage, and any process to treat sewage on board.

Maritime. Relating to the ocean.

Market economic value. See economic impact.

Mineral. Geology. Clay, stone, sand, gravel, metalliferous ore, non-metalliferous ore, or any other solid material or other matter of commercial value.

Mitigation measure. A measure designed to address an environmental problem. Per NEPA, adequate mitigation must, for example, adequately avoid, minimize, rectify, reduce, eliminate, or compensate for an environmental impact caused by a proposed action. See also unmitigatable impact.

Multiplier impacts. This term refers to the secondary or ripple effects of spending in an economy for a given activity. Often multiplier impacts are broken down into indirect and induced impacts. Indirect impacts include the purchasing of inputs to produce a good or service such as wages for labor, electricity, water, and sewage services, capital, etc. Induced impacts include the next and following rounds of spending as workers and owners spend their incomes for goods and services and the recipients of this spending repeat this process. For any given economy, this process is limited by how much of the spending stays in the given area. The larger the study area for impact analysis, the larger the multiplier because more of the inputs of production are from the study area.

National Environmental Policy Act (NEPA). U.S. law passed January 1, 1970, creating the Council on Environmental Quality and encouraging productive and enjoyable harmony between people and the environment. Other stated goals include preventing damage to the environment and biosphere, stimulating health and welfare, and enriching the understanding of the ecological system and natural resources important to the nation. See also Environmental Assessment, Environmental Impact Statement, lead agency.

Native. Belonging to a particular region.

Navigation aid. Any instrument used to assist in the guidance of ships or other vessels from place to place.

Nonconformance. Not complying with regulation or determined standards, such as local air quality limits.

Nonrenewable resources. Resources that are not replenished or rejuvenated within a usable time frame, such as petroleum products or old-growth forests.

Nonmarket economic value. See consumer's surplus, producer's surplus, and economic rents.

Notice of Intent (NOI). The first step in preparing an EIS is to publish an NOI in the Federal Register. In accordance with NEPA, an NOI must include a description of the proposed action and alternatives, a description of the scoping process and any scoping meetings, and the name and address of a contact person within the lead agency. See also Environmental Impact Statement, lead agency, National Environmental Policy Act, scoping.

Ozone (O3). An air pollutant formed photogenically through a reaction with NOx and ROCs.

Paleocoastal. Early coastal cultures, described by Moratto (1984).

Parameters. Features that may be measured. Often used in scientific or statistical descriptions of a population or subject of study.

Performance indicators. Criteria that are used to evaluate the success of a particular plan or program.

Pier. A vertical structure that support the spans of a bridge.

Pile. A heavy beam of timber, concrete, or steel, driven into the earth as a foundation or support for a structure.

Pleistocene. A geologic time period of the early Quaternary Period, characterized by alternating appearance and recession of northern glaciation and the appearance of the ancestors of human beings.

Precautionary approach. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.

Produced water. Water, usually salt water or brine, produced with oil in a pumping well. Small amounts of salt water can be separated out at the well site and put in an earthen evaporation pit. Large volumes must be dealt with by pumping it back into disposal wells, which force the super-salt brine into a porous formation isolated by impervious strata above and below. (County of Santa Barbara Energy Division 2005)

Producer's surplus. The amount a producer receives for a good or service above the costs of producing a good or service.

Propagating. Biology. Transmitting from one generation to the next.

Proposed action. A planned action that exists at the stage when a lead agency has a goal and is actively preparing to make a decision on one or more alternative means of accomplishing that goal. The Proposed

Action is the preferred alternative of the lead agency. At this stage, the effects of the Proposed Action can be adequately evaluated. See also lead agency, National Environmental Policy Act.

Radiocarbon date. An estimated age of an ancient object, such as an archaeological specimen, determined by measuring the amount of carbon-14 (a naturally radioactive isotope of carbon) that it contains.

Reasonably foreseeable. The range of actions or events that will probably occur in the near future.

Reconnaissance. A preliminary study or survey of an area.

Riverine. Botany. A wetland occurring near a river.

Roost. Zoology. To sit, rest, or sleep atop a pole or tree; a place where birds rest.

Scoping. A public process designed to determine the scope of issues to be addressed in an EIS and to help identify any significant impacts relating to the proposed action. The "scope" of an EIS includes the types of actions to be included, the range of alternatives, and the impacts to be considered. See also Environmental Impact Statement.

Seine. A large fish net with sinkers on one edge and floats on the other. A seine hangs vertically in the water and is used to capture fish when its ends are pulled together.

Short-term impact. An impact occurring for a specified and limited amount of time.

Significant impact. Under NEPA, an impact on some aspect of the environment or public health and safety caused by an action that exceeds a set criterion or established threshold. When determining whether an impact is significant, the analyst must consider the "context" in which it will occur and the "intensity" of the proposed action. If a proposed action has the potential for a significant impact, an EIS must be prepared. See also Environmental Impact Statement, intensity, National Environmental Policy Act, threshold.

Socioeconomics. The study of society as it relates to the social or economic aspects of a given activity or set of activities. Theory and applied tools from the fields of economics, sociology, anthropology, political science, public administration, and history are used.

Species. Biology. Taxonomic group whose members can interbreed and produce viable offspring.

Stringent. As applied to a rule or standard, having rigor, strictness, or severity.

Submerged lands. The lands underlying the waters of the Sanctuary.

Substrate. The material that an organism, such as a plant, lives on or is attached to.

Sustainability. The property of being maintained at length without interruption or weakening.

Threatened species. Biology. Under the ESA, any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range (16 U.S.C. 1532). See also ESA.

Threshold. A point separating conditions that will produce a given effect from conditions that will not produce the effect.

Tomol. A plank canoe used by the Chumash, a maritime-oriented California Native people. (Also used by the Tongva people to the South, whose name for it is "tiat".) See also Chumash.

Total petroleum hydrocarbons (TPH). A measurement of hydrocarbon contamination that can be attributed to petroleum.

Tsunami. A long period sea wave generated by a subsea earthquake or volcanic eruption that may travel thousands of miles. Tsunamis cause damage when they inundate coastal areas.

Turbidity. The measure or state of sediment or other particles suspended in water.

Unconsolidated. Not of one coherent body. Geology: unconsolidated sediments, deposits, etc.

Unit, oil. A unit is a number of leases grouped into a single management entity to prevent waste, conserve natural resources, and protect Federal royalty interests.

Unmitigatable impact. A significant impact that cannot be lessened to insignificance with mitigation. See also mitigation measure, significant impact.

Vernal pool. Biology. A temporary wetland that forms in a shallow depression underlain by a substrate that restricts the percolation of water into the ground. See also wetland.

Watershed. A topographically delineated region or area drained by a stream system. A hydrologic unit frequently used as a physical-biological unit and a socio economic-political unit for management and planning of natural resources bounded peripherally by a water parting and draining ultimately to a particular watercourse or body of water.

Wetlands. Biology. Under the Federal Water Pollution Control Act, areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas (33 CFR 328.3).

APPENDIX A.1

NOTICE OF INTENT

[Federal Register: June 11, 1999 (Volume 64, Number 112)]
[Proposed Rules]
[Page 31528-31529]
From the Federal Register Online via GPO Access [wais.access.gpo.gov]
[DOCID:fr11jn99-19]

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

15 CFR Part 922

Initiation of Review of Management Plan/Regulations of the Channel Islands National Marine Sanctuary; Intent to Prepare a Draft Environmental Impact Statement and Management Plan; Scoping Meetings

AGENCY: Office of Ocean and Coastal Resource Management (OCRM), National Ocean Service (NOS), National Oceanic and Atmospheric Administration, Department of Commerce (DOC).

ACTION: Initiation of review of management plan/regulations; intent to prepare environmental impact statement; scoping meetings.

SUMMARY: The Channel Islands National Marine Sanctuary (CINMS or Sanctuary) was designated in September 1980, and consists of 1,252 square nautical miles of open ocean and near shore habitat approximately 25 miles off the coast of Santa Barbara, California, encompassing the waters surrounding San Miguel, Santa Rosa, Santa Cruz, Anacapa and Santa Barbara Islands from mean high tide to six nautical miles offshore. The present management plan for the Sanctuary was completed in 1982. In accordance with section 304(e) of the National Marine Sanctuaries Act, as amended, (NMSA) (16 U.S.C. 1431 *et seq.*), the Marine Sanctuaries Division (MSD) of the National Oceanic and Atmospheric Administration (NOAA) is initiating a review of the management plan, to evaluate substantive progress toward implementing the goals for the Sanctuary, and to make revisions to the plan and regulations as necessary to fulfill the purposes and policies of the NMSA.

The proposed revised management plan will likely involve changes to existing policies and regulations of the Sanctuary, to address contemporary issues and challenges, and to better protect and manage the Sanctuary's resources and qualities. The review process is composed of four major stages: information collection and characterization; preparation and release of a draft management plan/environmental impact statement, and any proposed amendments to the regulations; public review and comment; preparation and release of a final management plan/environmental impact statement, and any final amendments to the regulations. NOAA anticipates completion of the revised management plan and concomitant documents will require approximately eighteen to twenty-four months. NOAA will conduct public scoping meetings

to gather information and other comments from individuals, organizations, and government agencies on the scope, types and significance of issues related to the sanctuary's management plan and regulations. The scoping meetings are scheduled for the weeks of June 21 and July 5, 1999, as detailed below.

DATES: Written comments should be received on or before July 27, 1999.

Scoping meetings will be held:
(1) Monday, June 21, 1999, 6:30pm in Lompoc.
(2) Tuesday, June 22, 1999, 6:30pm in Santa Barbara.
(3) Wednesday, June 23, 1999, 6:30pm in Oxnard.
(4) Thursday, June 24, 1999, 6:30pm in Long Beach.
(5) Friday, June 25, 1999, 6:30pm in Ventura.
(6) Wednesday, July 14, 1999, 2:00pm in Washington, D.C. addresses: Written comments may be sent to the Channel Islands National Marine Sanctuary (Management Plan Review), 113 Harbor Way, Santa Barbara, California 93109. Comments will be available for public review at the same address.

Scoping meetings will be held at:
(1) Cabrillo High School, Room SS-5, 4350 Constellation Rd., Lompoc, CA 93456.
(2) Chase Palm Park Center, 323 East Cabrillo, Santa Barbara, CA 93103.
(3) Casa Sirena Hotel and Marina, 3605 Peninsula Rd., Oxnard, CA 93035.
(4) Long Beach Aquarium Theatre, Long Beach, CA 90802.
(5) Sheraton 4-Points, Windjammers Meeting Room, 1080 Navigation, Ventura, CA 93001.
(6) Herbert C. Hoover Building, 14th & Constitution Avenue, NW, Washington, DC 20230.

FOR FURTHER INFORMATION CONTACT: Anne Walton, Management Plan Specialist, at (805) 884-1470.

Authority: 16 U.S.C. Section 1431 *et seq.*

(Federal Domestic Assistance Catalog Number 11.429 Marine Sanctuary Program)

Dated: June 4, 1999.

John Oliver,
Chief Financial Officer/Chief Administrative Officer, National Ocean Service.

[FR Doc. 99-14717 Filed 6-10-99; 8:45 am]
BILLING CODE 3510-08-M

APPENDIX A.2

SDEIS NOTICE OF INTENT

[Federal Register: July 25, 2007 (Volume 72, Number 142)]
[Proposed Rules]
[Page 40775-40776]
From the Federal Register Online via GPO Access [wais.access.gpo.gov]
[DOCID:fr25jy07-19]

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

15 CFR Part 922

Notice of Intent to Prepare a Supplemental Draft Environmental Impact Statement for the Channel Islands National Marine Sanctuary Management Plan Review

AGENCY: National Marine Sanctuary Program, National Ocean Service, National Oceanic and Atmospheric Administration, Department of Commerce.

ACTION: Notice of intent.

SUMMARY: Notice is hereby given that the National Oceanic and Atmospheric Administration's (NOAA) National Marine Sanctuary Program (NMSP) is preparing a Supplemental Draft Environmental Impact Statement (SDEIS) to supplement and/or replace information contained in the Draft Environmental Impact Statement (DEIS) for the Channel Islands National Marine Sanctuary (CINMS or Sanctuary) management plan review. The SDEIS will analyze revisions to the Sanctuary's proposed action that would, in effect, prohibit the following discharges within the Sanctuary: (1) All sewage from vessels 300 gross registered tons (GRT) or more, including cruise ships and oceangoing ships; and (2) graywater from vessels 300 GRT or more, including from cruise ships, and from oceangoing ships with the capability to hold graywater while within the Sanctuary.

DATES: Because the NMSP has previously requested (64 FR 31528 and 71 FR 29096) and received extensive information from the public on issues to be addressed in the SDEIS, and because the Council on Environmental Quality (CEQ) regulations for implementing the National Environmental Policy Act (NEPA) do not require additional scoping for this SDEIS process (40 CFR 1502.9(c)(4)), the NMSP is not asking for further public scoping information and comment at this time. Upon release of the SDEIS the NMSP will provide a 45-day public review/comment period.

ADDRESSES: Copies of the 2006 DEIS are available at Channel Islands National Marine Sanctuary, 113 Harbor Way, Suite 150, Santa Barbara, California and on the Web at http://channelislands.noaa.gov.

FOR FURTHER INFORMATION CONTACT: Michael Murray at (805) 884-1464 or michael.murray@noaa.gov.

SUPPLEMENTARY INFORMATION: During the DEIS public review period (May 15 through July 21, 2006) NOAA received a wide range of comments, including substantial public and agency comments about changes proposed for Sanctuary regulation of sewage1 and graywater discharges from large vessels.2 The DEIS provided three regulatory alternatives: The preferred alternative, alternative 1, and the no-action alternative. The DEIS preferred alternative and NOAA's then-proposed action would clarify that a type I or II marine sanitation device (MSD) is required for discharge of treated sewage within the Sanctuary and proposes that graywater discharge from all vessels be excepted from the discharge prohibition. Alternative 1 also proposes a graywater exception from the prohibition for all vessels, but would prohibit discharge into the Sanctuary of treated or untreated sewage from large vessels (greater than or equal to 300 GRT). The no action alternative would retain the status quo regulation on discharge, which is ambiguous with regard to graywater and imprecise with regard to the type of MSD required for vessel sewage discharge within the sanctuary.

Comments included a request that NOAA adopt the discharge regulation under alternative 1, which would prohibit any sewage discharges from large vessels, whether treated or untreated. Comments also included a request that NOAA prohibit cruise ship discharges in Sanctuary waters. In addition, there were suggestions that NOAA implement recommendations contained in the water quality needs assessment developed by a working group of the Sanctuary Advisory Council (available at http://www.channelislands.noaa.gov/sac/pdf/10-17-05.pdf), which provides a comprehensive evaluation of water quality threats and provides a broad range of management advice. This assessment includes a recommendation that NOAA prohibit cruise ship discharges in Sanctuary waters. In addition, comments from State agencies and a suite of environmental non-governmental organizations indicated that NOAA's proposed exception for graywater discharges is inconsistent with the California Clean Coast Act (California Public Resources Code sec 72420-72422) that prohibits graywater discharges from vessels 300 gross registered tons or more within state waters. The types of comments described above were the only types of comments received on the issues of graywater and sewage discharge from large vessels.

In May 2006 NOAA submitted its Coastal Zone Management Act consistency finding to the California Coastal Commission (Commission), in compliance with Federal consistency regulations (15 CFR part 930). In July 2006 the Commission conditionally concurred with the finding that the proposed revised Sanctuary management plan and regulations are fully consistent with the enforceable policies of the California Coastal Management Program. The Commission voted to concur with the consistency finding on the condition that NOAA revise the proposed discharge and deposit regulation to prohibit vessels of 300 GRT or more from discharging sewage or graywater into the waters of the Sanctuary.

After reviewing these public comments, considering the Commission's action, and further analyzing the vessel discharge issues raised, NOAA proposes to revise its proposed action with regard to prohibition of graywater and sewage discharges from large vessels. NOAA also proposes to define the terms ``oceangoing ship`` and ``cruise ship'' within the Sanctuary regulations. The SDEIS, in conjunction with

[1] Sewage means human body wastes and the wastes from toilets and other receptacles intended to receive or retain body wastes (40 CFR 140.1(a)).

[2] ``Large vessel'' is used herein to mean any vessel of 300 GRT or more. 300 GRT is an established state and federal size class threshold for vessel discharge regulation purposes. This includes oceangoing ships and cruise ships. ``Oceangoing ship'' means a private, commercial, government, or military vessel of 300 GRT or more, not including cruise ships. ``Cruise ship'' means a vessel with 250 or more passenger berths for hire.

the concomitant supplemental proposed rule, will evaluate the revised proposed action and provide the public with an opportunity for additional review and comment.

Authority: 16 U.S.C. 1431 *et seq.*

Federal Domestic Assistance Catalog Number 11.429 Marine Sanctuary Program.

Dated: July 18, 2007.

William Corso,
Deputy Assistant Administrator, Ocean Services and Coastal Zone Management, National Oceanic and Atmospheric Administration.

[FR Doc. 07-3608 Filed 7-24-07; 8:45 am]
BILLING CODE 3510-NK-M

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APPENDIX A.3

DOCUMENTATION OF PUBLIC SCOPING PROCESS

Public involvement, through scoping, Sanctuary Advisory Councils, workshops, public hearings, submission of written comments, and other means, is vital to the management plan review process and helps Sanctuaries to identify resource management issues and possible solutions. Since CINMS initiated its management plan revision in 1998 the Sanctuary has received comments from thousands of individuals (see the scoping comments archive below). CINMS encourages members of the public to continue expressing their ideas and concerns about the management plan revision through numerous opportunities to comment and get involved.

A.3.1 PUBLIC SCOPING

The Council on Environmental Quality (CEQ) requires Federal agencies to conduct scoping prior to preparing an Environmental Impact Statement (EIS) for a proposed action. According to CEQ regulations (40 CFR 1501.7), "There shall be an early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to a proposed action. This process shall be termed scoping."

CINMS conducted scoping prior to preparing an EIS as part of the management plan review process. From June to August of 1999 CINMS held seven public scoping meetings on management plan revision across Santa Barbara, Ventura, and Los Angeles counties, as well as in Washington, D.C. During those meetings numerous individuals raised a wide range of local, regional and national resource concerns and management suggestions. In addition, the Sanctuary received numerous comments about management plan revision via letters, email, and fax. Sanctuary staff compiled these comments and suggestions in two formats: 1) in raw form organized by scoping meeting location, and 2) in synthesized form and organized by issue categories.

A.3.1.1 Public Scoping Comments - Organized by Location

Please note that these are the raw comments extracted from seven public scoping meetings (held from June to August, 1999) along with letters, faxes, and emails received during and after those meetings. These comments were edited for clarity where necessary.

Lompoc

- The Sanctuary needs to be proactive about terrestrial impacts on water quality, (including terrestrial runoff on islands and link to non-native species)
- The Sanctuary needs to evaluate current military activity and impacts on the environment
- Better education needed for recreational divers on their impacts on the resources (from both consumptive activities and the activity of diving itself)
- The Sanctuary should look at creating artificial habitats from out of commission oil rigs and the sinking of ships
- Improve education and outreach efforts to better educate the public about the Sanctuary, its boundaries and resources

- Increase monitoring and enforcement efforts
- The Sanctuary should help to improve marine education in the public school system
- The Sanctuary should focus on habitat needs (fisheries stocks and the physical/biological habitat) including preservation and restoration
- The Sanctuary should work better with other regulatory agencies in managing the resources
- The Sanctuary should consider its position with the expanding range of the sea otter
- Make any Sanctuary restrictions easy and logical for the public
- Keep access to the Sanctuary open to the public, make it smart and protect the resources for future generations

Santa Barbara

- Use adaptive management as the framework for the management plan
- Increase collaboration between agencies
- Adopt an ecosystem approach to management
- Increase and/or establish no take zones to protect biodiversity
- Evaluate accommodation and impacts of sea otters
- Evaluate level and effectiveness of enforcement of regulations
- Conduct a full inventory of species by habitat type, characterize habitats, assess health, look at natural fluctuations vs. human impacts - evaluate the condition of the resources from a scientific perspective
- Incorporate performance standards
- Address water quality issues including looking at impacts from outside Sanctuary boundaries
- Evaluate the impacts on the resources from commercial fisheries and consider no-take zones as a management tool
- Identify and evaluate recreational, military, oil and gas impacts, take steps to limit the uses found to create negative impacts, or mitigate if appropriate
- Refocus on resource protection rather than use
- Balance of protection and use based on scientific information instead of emotion (politics)
- Expand boundaries north to Santa Rosa Creek with goal of protecting biodiversity
- Study impacts of commercial fishing on the resources

- Include land use issues in management plan (non-point source pollution, etc.)
- Improve public education and outreach efforts
- Evaluate impacts from oil drilling including vessel strikes, pipes, platform blowout, other accidents, potential for increased drilling, impacts on tourism
- Evaluate commercial fishing impacts: ships and fleets from outside region, impacts of lights on marine mammals, separate impacts from El Nino from commercial fishing impacts, look at the impacts of squid fishing on dolphins and pinnipeds
- Evaluate the health of kelp, look at impacts from siltation, pollution, run-off, plumes
- Look at general issues of non-point source pollution
- Need to focus on research and include participation of commercial fisherman
- Look at sea otters and the disruption of the ecosystem, the use of mariculture to feed them
- Look at impacts from increasing population and decreasing resources
- Consider interconnections of habitats and ecosystem (reduce stresses on the system, examine impacts)
- Concerned about limitation on access or use of resources, willingness to accept limitations if guarantee continuation of access to fisheries
- Boundary expansion to include entire channel (safety, efficiency, information exchange, environmental reasons), and Santa Catalina
- Better coordination of agencies that share jurisdiction over the resources
- Increase support for Sanctuary by increasing education and awareness
- Sanctuary needs to work with Park Service on impacts on marine environment from terrestrial activities on islands (virus in mice, fox hunting, erosion, runoff)
- Expand boundaries northward because of richness, dynamic province, it may contribute to the Channel Islands ecosystems, strong upwelling components for overall system - threats include development, oil, mining, (even potential threats to health of the coastal zone)
- Make boundary determinations based on ecosystem perspective
- Management plan must call for an active role in oil/gas lease agreements/sales
- Sanctuary to consider effects of rigs-to-reef on surrounding environments
- Define more clearly the authorities of the Sanctuary, investigate possibility of accruing greater authority
- Sanctuary should partner with coastal water shed and water quality groups

- Need to understand what happens nearshore and inter-islands ecologically and with regard to water quality
- Resource management should be based on a thorough understanding of ecosystem management vs. species by species management
- Boundaries should expand to shore to encompass: ecosystem perspective, connection between ocean and land, water quality
- Sanctuary expansion should provide forum to merge interest groups and concerns
- As part of the management plan review process, maps of the islands and Sanctuary boundaries should be placed on the website with links to other interest groups. Do this to encourage public interest and ownership of the process, include: what Sanctuary is, what Sanctuary does and does not do, maps showing resources, activities and issues. Do this in simple language, clear English, concept oriented
- Enhance outreach efforts to stimulate public involvement in management plan revision process, foster stewardship
- Understand dynamism of ecosystems and our role in monitoring, evaluate to result in adaptive management
- Increase funding to achieve objectives
- Use CalCOFI data and increase water quality data collection to CalCOFI stations and in between those stations (closer to shore and more offshore)
- Mooring systems for boaters who regularly visit islands (protect kelp and bottom)
- Better weather reporting (more sites, live cameras on islands, more real-time reports) to improve safety
- Provide hard copies of current management plan in public libraries
- Better enforcement and monitoring
- Northward boundary expansion to protect spawning grounds
- Revitalizing coastal Chumash culture, question of access to sacred areas (don't want any restrictions on access)
- Concern about threat of oil leases being exercised
- Marine reserves - for protection of sea otters/macro invertebrates
- Different jurisdictional authorities need to be identified, Sanctuary needs to have influence
- Sanctuary should be coordinating agency for other authorities and needs more regulatory authority

- Sanctuary should address water quality issues
- Sanctuary should make connections between watersheds and ocean systems through education and outreach
- Concern about oil/gas leases - include language (to maximize protection of the resources) in the reauthorization of renewal of existing leases
- Concern about increased use of the area, not more regulation of multi-use (ecotourism)
- If the SAC will be dealing with boundary expansion issues, then San Luis Obispo should be represented on Sanctuary Advisory Council
- Chumash would like to be represented on the SAC

Oxnard

- Interest in monitoring of abalone populations
- Concern about impacts from military activity and expansion plans (Navy Sea Test Range)
- Concern about discharge from fishing vessels
- Education/outreach should be a top priority: more resources and activities, focus on primary schools, expand programs outside of Santa Barbara, teacher workshops, develop this at early age, provide more direct interaction with the marine resources, interpretive enforcement (backed up by law enforcement)
- Investigate our use of terms such as "resources", "no-take zones"
- Take resource management out of the hands of the Dept. of Commerce
- Laws should be made adequate enough to protect the resources
- Limited entry for divers
- No-take zones with limited access demonize certain activities, no-take zones should be absolute, that don't let anyone in except for navigation
- Visitor use should be limited and appropriate such as the use of sea caves where there are nesting seabirds

Long Beach

- Concerned about protecting sea otters
- Opposed to oil and gas development in the channel
- Concerned about funding - adequate financial resources to carry out mission
- Concerned about impacts from recreational boaters, more education needed yacht clubs

- Need to address habitat enhancement for endangered species - should be a priority over human use
- Need to address the threat that non-native species pose to endangered species
- Need to take a look at maximum enforcement of regulations
- Need a comprehensive and complete management plan with research areas - no-take zones and ground truth areas for sampling
- Need to be strong about what is allowable and what is not
- The management should address terrestrial impacts on the Sanctuary - the relationship between human activities in the island watersheds and the effect on the intertidal
- Enforcement should allow for more than paper protection (need citations, fines, etc.)
- Concerned about aquaria collectors taking too many resources
- Need to recruit stewards of the Sanctuary
- The Sanctuary needs to engage in "gorilla" marketing (more aggressive self-promotion)
- Concerned about tanker traffic
- Concerned about water quality
- Concerned about the impact of kelp forests from urchin harvest

Ventura

- Interested (as a fisherman) what areas may be closed down
- Interested in seeing increased protection
- Would like to see water quality issues addressed in management plan
- Sea Test Range should be recognized as a use (having impacts on the Sanctuary)
- Coastal Ventura County is concerned with impacts in their area
- Need more offshore protection - need to sponsor a new bill for a new Sanctuary between Monterey Bay National Marine Sanctuary and Channel Islands National Marine Sanctuary – concerned about: offshore oil, fishing, would also support expansion to existing boundary
- Want to see a rotating closure for sea urchin fishery - pollution is the biggest issue, an all out closure would kill the fishery
- Sanctuary should take into account and be prepared for significant increase in military activity

- Sanctuary needs increase in protection from radar activity and not plan as if the military doesn't exist

- Need more outreach and partnerships with agencies, nongovernmental organizations, and in particular DOD - look to other more recent sanctuaries and their relationship to Dept. of Defense - be staunch in our own defense

- Concerned with nearshore water quality: more pressure on fish in islands, plume from Santa Clara river, make CINMS concerns apparent to other agencies

- Provide more education opportunities for the public

- Navy stated that they would be willing to share information on marine mammals, air quality, etc. with the Sanctuary to use in their EIS

- Interest in authorities and priorities - very confusing: outreach problem - public needs to be educated, need information in a sound bit

- Expand Sanctuary boundaries - include coast, make as big as possible, more needs to be protected, address coastal water quality issues, boundaries are too arbitrary and don't address threats outside boundaries

- Otters will cause more conflict with people who rely on the resources, CINMS should be prepared

Washington, D.C.

- Need to spell and formalize (including relationships with other agencies) the process for the management plan and marine reserves

- Marine reserve issue needs to fundamentally be part of the management plan

- Need to realize impact of extractive activities on the decline of the marine resources (rock fish, giant sea bass, etc)

- Support for exploring various issues within the issues of boundary expansion - tie to rationale - water quality, oil & gas, critical in EIS to state how boundary expansion will address these other issues

- Issue of funding and resources if boundary expand, need to develop budget to support

- Implementing new management plan will require more resources

- If you do reach out to the nearshore, suggest you include impacts/events in programs

- Need to consider runoff from Channel Islands due to erosion

- First priority for management plan should be emphasis on activities within current boundaries and why marine reserves are a critical issue

- Need to consider dynamics of sea otters as functional part of original community in Channel Islands and the roll of CINMS in re-establishing populations

San Luis Obispo

- If CINMS expanded the boundary, what could you do
- Need to have more oversight of discharge in SLO (two power plants), and monitor intake as well
- Concerned about development of 40 oil and gas leases off of SLO County
- What can the sanctuary do that existing agencies don't already do
- Need local CINMS presence
- Need to maintain sustainable fisheries
- Would boundary redefinition change the focus/mission of CINMS
- Concerned about status of resources on Santa Lucia Bank. Marine living resources don't know boundaries - are found in between sanctuaries, they need protection in all areas
- Need to create new sanctuary for: 1) local presence and control, 2) Point Conception to Point Blanca, 3) local needs/concerns need to be presented, 4) different environment, need different sanctuary, 5) might want higher standard (stricter regulations) for this area
- Need connection between CINMS and MBNMS
- Pinnipeds are overpopulated is the sanctuary going to do anything
- Ban personal watercraft
- Sanctuary status gives one more level of protection
- Focus on issues and threats protection of resources is paramount
- Oil out - concern about impacts on environment, must extend far enough to include federal leases
- Allow compatible uses of resources, eliminate incompatible uses
- Concerned that without prohibiting oil, it will still be allowed
- Existing plots should be researched before being allowed to be developed
- Concerned about rigs-to-reefs
- Citizen action is critical
- Trust relations with governments, what has both MBNMS and CINMS done since regulation to protect resources
- Local sanctuary needed to meet and address this community's need
- Need to define process for local sanctuary

- Implement and support research projects
- Slow down oil lease/platform development process
- Education should be about the resources
- General concern for health of the ocean; sanctuaries offer an opportunity to protect; need for comprehensive protection - ecosystem management
- If boundary expanded or new one designated, need local office
- Need community representation
- Concern that decision making would not occur locally
- Concern over regulation of kelp beds, concerned the MBNMS regulation of kelp beds could affect CINMS
- Concern that public will be shut out of regulatory process
- International designation of biosphere reserve could increase regulation/authority affecting the state's/county's resources
- Concern about impacts from commercial and sport fishing
- Confusion over resource protection, what specifically does the Sanctuary do
- Concern over fishery management and potential for sanctuaries to become involved in this
- Would the establishment of a sanctuary stop existing oil and gas leases, new leases
- Concern over the development of 40 undeveloped offshore leases, is there something that can be done
- Concern about water quality and non-point source pollution
- Support for sanctuary designation to address non-point source pollution
- Need for specific language to address sediment loads and specific sources of pollution, near shore resources have been impacted
- Need for summarizing of research that decision makers and the public can understand
- Concerned about harbor maintenance activities being further regulated
- Concern that fishery regulations might be put in place at a later time
- Concerned about dredging regulations that would impact fisheries
- Concerned that vessel traffic regulations may affect fisherman
- Concern that prohibitions of new structures would affect fisherman

- Too many stakeholders - not all needs can be met
- Concern that a local office needs to be established to represent local people
- Concern that reauthorization is a blank check to make changes in the program that would detrimentally affect fisherman
- Does not believe there are the same water qualities as the east coast
- Does not support expansion of the CINMS boundaries
- Support for expansion of CINMS to SLO - sanctuary would offer opportunity to preserve resources
- Need for comprehensive representation
- Concern about no take zones in other sanctuaries
- Concerned about mistakes made by resource managers
- Sanctuary program would bring in more democracy – increase public involvement in management issues
- How would new boundaries be selected or developed
- If boundaries extend to shoreline, do regulations apply upstream
- How is the public specifically involved in the process to expand CINMS boundaries
- Will CINMS come back to SLO after DEIS to hear comments
- Concern about oil and gas development
- Concern about polluted runoff
- Concern about motorized personal watercraft
- Concern about water quality
- Concerned about commercial fisheries being sustainable
- If it isn't broke, why fix it, many regulations already in place
- Lack of education about resources with policy makers
- Collapse of certain fishery resources in spite of regulations
- Establishment of no take zones - what are effects on commercial fishing
- Define role of National Marine Sanctuary Program

- Will designation change oil leases and discharges
- Watershed issues - establishing protection for these areas
- Residents love coastline, looking for mechanism to protect it
- Concerned about restrictions of commercial fishing in Morro Bay and Avila Beach, want to protect livelihoods
- Need sustainable fishing resources, regulations are important to protect environment and marine inhabitants in general
- Need to be careful of selective protection
- Ecosystem based approach
- Is there a proposed expansion
- We don't have to make 1,000's of miles of oceans of private aquarium
- Consider boundary expansion alternative
- Balance between protection and commercial fishing
- Need local control an input
- Stop industrial assault
- Protection needs to come from existing national marine sanctuary
- Fishing industry concerned with trust, what does sanctuary do
- The following items need action now, not 5 years from now: oil, water quality, unregulated motorized personal watercraft
- Sanctuary provides umbrella
- Education of public is important, what is protection
- Does sanctuary designation improve water quality

Written Comments

- Establish the proposed Central Coast National Marine Sanctuary or expand CINMS to include waters from Pt. Arguello to the southern end of MBNMS
- Need local hearing on management plan in San Luis Obispo County
- Create a marine sanctuary off the coast of San Luis Obispo
- In favor of proposal to create a separate sanctuary for the central coast area

- Report from commercial fisherman in Oxnard: kelp is bouncing back, sea urchins = lots and a lot of legal picking size - the best in years, sea cucumbers- seeing a lot in all sizes, Santa Rosa and Miguel = alot of abalone except where sport divers dive, alot of large sheephead and other fish are larger

- Support for extension of the area managed by CINMS to include, as a minimum, Santa Lucia Bank area in San Luis Obispo County with consideration to include the intertidal zone from Pismo Beach to Avila Beach

- The revised management plan should include a comprehensive, coordinated strategy for protecting resources from water quality impairment (land based pollution), efforts should include in increased public awareness, research and monitoring

- Develop water quality strategy that includes wastes from boats including no-discharge zones

- Include provisions for prohibiting discharge outside of Sanctuary boundaries that may impact Sanctuary resources

- Propose to designate more ecological reserves within the Sanctuary to protect marine biodiversity: maintain key processes in a relatively undisturbed manner, lessen impact of large scale natural disasters, increase understanding of the marine environment, provide research opportunities

- '15 CFR 922.71' (exploring for, developing, and producing hydrocarbons), this section should be clarified so that any of these activities will be prohibited. Should also include prohibiting the exploration for, development, or production of minerals.

- Management plan should stress forming new partnerships with other federal and state agencies, research institutions, local governments, user groups, citizen groups, and others to implement a strategy for restoring and protecting Channel Islands ecosystem

- Expand the boundaries to improve protection of wildlife from pollution, expanding offshore oil drilling, and other potential threats

- Add language to Sanctuary regulations to govern the relationship with Dept. of Defense, regulations should require all military activities to avoid to the Maximum Extent Practicable any adverse impact to Sanctuary's resources or quality

- Urges National Marine Sanctuary Designation for the Central Coast

- A need for a new marine sanctuary covering the central coast area between Monterey Bay National Marine Sanctuary and Channel Islands National Marine Sanctuary

- Fight against the activation of new offshore oil leases

- Develop a fishery management program under the auspices of Sanctuary

- Consider expanding the boundaries of CINMS to include the resources already identified in the draft revision to the site evaluation list or expansion of sanctuary boundaries to be studied as an alternative

- Boundary expansion of CINMS to include the coastal waters of Santa Barbara and San Luis Obispo County

- Need a permanent sanctuary on the Central Coast as protection from drilling (oil and gas)

- No commercial fishing or "taking" of any kind. There must be someplace where nature is truly safe from the wholesale destruction the human race specializes in. . . a place where nature is supreme

- Extend the boundaries northward into San Luis Obispo County, include the Santa Lucian Bank, a nursery for many marine species and San Simeon where the elephant seals nurse their pups.

- Extend the northern boundary to include the Santa Lucia Bank to protect an area critical to the life cycles of so many marine species of concern and preclude the imminent threat of new offshore oil development

- Of utmost importance is the need for the management plan to maximize the recovery of endangered and threatened species

- Consider the possibility of extending the boundaries of CINMS northward to include southern San Luis Obispo County and the Santa Lucia Bank

- NAVAIRWARCENWPNDIV requests the Sea Range operations that continue to utilize the CINMS waters and airspace above be recognized. This continued utilization is consistent with previous management plans and implementation regulations. These activities are conducted in compliance with all environmental and other regulations including stringent safety procedures to ensure operating areas are cleared of all civilian air and ship traffic. Significant increases in the types and tempos of activities in the CINMS are not planned.

- Against all offshore drilling

- Urge consideration of expanding the CINMS northward to the southern boundary of the MBNMS, this expansion to include the Santa Lucia Bank

- Urge consideration of expanding the CINMS northward to the MBNMS, this expansion to include Santa Lucia Bank

- Concerned with nearshore water quality affects the entire region

- Coordinate with other federal and state agencies to improve nearshore water quality and restore critical habitat provided by the region’s rivers and estuaries

- Concerned about current and future military operations within and directly adjacent to the sanctuary. The impact of this technology on marine mammals

- Recommend expansion of the CINMS boundaries to have greater control over regional influences that affect the sensitive marine environment

- Address the impacts of water pollution on the sanctuary and its wildlife

- Establish a network of sea life reserves to promote biodiversity, improve scientific understanding, maintain some areas of the oceans as wilderness

- Evaluate the advantages for the ecosystem by expanding the sanctuary's boundaries
- Improve coordination with federal and state agencies, particularly the Dept. of Defense
- Strengthen protections from expanded offshore oil and gas development and mineral extraction
- Coordinate fisheries research
- Highlight the significant need for increased federal appropriations to support existing and new responsibilities
- A plea to either extend the CINMS north to meet the southern edge of the MBNMS (Santa Rosa Creek at Cambria), or extend both to meet in the middle somewhere
- We request that an expansion of the Sanctuary boundaries be studied as an alternative and that it include development of a management plan that has quantifiable performance objectives
- The Navy objects to any proposed changes in the plan and regulations for the CINMS that would hinder Navy's ability to continue to train for combat readiness or test weapons systems in support of National defense
- The Santa Lucia Bank off of Point Sal causes upwelling of mineral-rich waters that provide nutrients to the CINMS, this would be an important addition to the ecosystem that is presently being managed with long-term sustainability in mind
- Marine sanctuary status would help us preserve this area as a renewal grounds for fisheries and the nearshore ecosystem. Fisherman would benefit from this in the long term
- Perception by fisherman that worldwide and local perceptions and concepts are driving fishery management decisions, not actual scientific information
- Concern about fishing access to the Channel islands area especially regarding the harvest refugia proposal. Constituents want to know whether reserves will be no-take or partial-take such as fishing for pelagic species but not benthic species. They also question how fair it is to keep humans out of no-take zones and not also consider marine mammal impacts.
- The impact of marine mammals (*i.e.*, sea lions, harbor seals, sea otters) on coastal and pelagic species (*i.e.*, northern anchovy, sardine, jack mackerel, Pacific mackerel) and recreational fish is a concern. There is a perception that the protection of marine mammals is having a devastating effect on fisheries on some of NMFS' constituents believe that marine mammals should be managed.
- Regarding the Channel Islands, some members of the public think there are enough marine reserves in California.
- Constituents also want to see economic studies performed on the effects of no-take areas
- Anecdotal information suggests that squid fishing operations working within sanctuary boundaries is altering the behavior of seabird species that roost and breed on the Channel Islands, resulting in increased nest abandonment and predation rates.

- Hazardous material spills resulting from activities within sanctuary boundaries, including leaks from commercial and recreational watercraft and spills from oil exploration or development activity could adversely affect many species and their prey bases. Oil spills are especially harmful to the endangered southern sea otter, as contact with oil decreases the southern sea otter's natural insulation against temperature loss and can result in hypothermia or death.

- The noise and vibrations from the operation of motorized watercraft or other heavy equipment may harass species and impair their ability to feed. This form of disturbance could cause individuals of many species to alter the behavior (*e.g.*, activity periods, space use), resulting in increased risk of predation, reduces access to resources, and reduced breeding success.

- Disturbance from other recreational or commercial activities permitted within sanctuary boundaries, such as fishing, SCUBA diving, or snorkeling, could disturb species and affect their ability to forage or reproduce.

- Support expanding the Channel Islands National Marine Sanctuary to include the San Luis Obispo marine environment

- The status quo is simply too risky as periodic attempts are made to open up our coast to greater economic development.

- Urge you to support the extension of the Channel Islands Marine Sanctuary to our county (SLO).

- Support for the extension northward of the CINMS to include areas around and including the Santa Lucia Bank off the Santa Maria Basin, this is an area of extreme importance to fisheries and should in no case be exposed to risk by oil drilling and extraction operations by the development of existing lease sites

- Hold firm for the protection of the marine resources and let the politicians handle the lease issues

- I am in favor of expanding the CINMS boundary northward and am willing to dedicate my time and energy toward that reality

- Because of the biodiversity, it seems the central coast would be better served by creation of a completely new sanctuary, where a management plan can be developed to meet the unique challenges found here

- Would like to see expansion of the boundaries to Nipomo Dunes and Point Sal

- The purpose of this letter is to voice strong support for extending the CINMS to include the Central Coast islands

- Any material oil spill could have devastating effects and damage to these areas both north and south of the undeveloped leases. We strongly urge your CINMS group to sponsor such a study which would be extremely valuable information in getting marine sanctuary protection in this area. And it would be persuasive information for not allowing these undeveloped leases from being developed.

- I am convinced that it is extremely important to increase protections for the splendid CINMS. First, a revised management plan should clearly address the impact pollution has on the sanctuary's wildlife and water quality. Second, a revised management plan should establish

effective sea life reserves within the sanctuary where human activities are limited and strictly monitored. Finally, it is essential that the new plan will study whether the current boundaries are appropriate to protect marine wildlife of the Channel Islands.

- I hope you will consider extending the boundaries of the CINMS northward to meet the MBNMS and eastward to the mainland. The possibility of future oil exploration and development poses a threat to the CINMS. The seismic survey, oil spills and vessel traffic that will result from such exploration and development can cause damage to the ecosystems and disturb marine life within the Channel Islands

- Support for efforts to increase protections for the spectacular marine life of the CINMS. The new management plan should clearly address the impact pollution has on the Sanctuary's wildlife and water quality. The management plan should establish effective sea life reserves, areas where human activities are limited, within the sanctuary and the new plan should study whether the current boundaries are appropriate to protect the marine life of the Channel Islands.

A.3.1.2 Public Scoping Comments Synthesis - Organized by Issue Category

Many members of the public provided comments on the same topical areas, or issue categories. These included: water quality; education and outreach; research, monitoring and enforcement; boundary redefinition; military activity; oil and gas; marine reserves; sea otters; and other management issues. Please note that Sanctuary staff produced this synthesis of comments based on raw comments extracted from seven public scoping meetings (held from June to August, 1999) along with letters, faxes, and emails received during and after those meetings. The raw comments are provided above in section A.3.1.1.

Water Quality

Communities in which individuals provided scoping comments regarding water quality were: Lompoc, Santa Barbara, Oxnard, Long Beach, Ventura, and Washington, D.C. Comments regarding water quality were also received in written format. Specifics comments included the following:

- Increase public awareness about water quality through education

- A no discharge zone for boats

- Need comprehensive coordinated strategy

- Concern over discharge from fishing vessels

- Make connection between watersheds and ocean systems

- Increase water quality data collection stations

- Sanctuary should partner with coastal watershed and water quality groups

- Impact on kelp from siltation, pollution, runoff

- Look at impacts on sanctuary from outside of boundaries

- Include provisions for prohibiting discharges outside of sanctuary boundaries that may impact sanctuary resources
- Be proactive about terrestrial water quality impacts (including from the Channel Islands)

Education and Outreach

Communities in which individuals provided scoping comments regarding education and outreach were: Lompoc, Santa Barbara, Oxnard, Long Beach, Ventura, and San Luis Obispo. Comments regarding education and outreach were also received in written format. Specifics comments included the following:

- Better education about sanctuary boundaries and resources
- Better recreational diver education
- Maps showing resources, activities and issues
- Enhance outreach efforts to stimulate stewardship
- Should be top priority: more resources and activities, focus on primary schools, and outside of Santa Barbara
- Sanctuary should work to improve marine education in the public schools
- More education needed for yacht clubs

Research, Monitoring, and Enforcement

Communities in which individuals provided scoping comments regarding research, monitoring, and enforcement were: Lompoc, Santa Barbara, Oxnard, Long Beach, and San Luis Obispo. Comments regarding research, monitoring, and enforcement were also received in written format. Specifics comments included the following:

- Increase monitoring and enforcement efforts
- Evaluate effectiveness of enforcement of regulations
- Research should include participation of fisherman
- Understand dynamism and our role in monitoring
- Use CalCOFI data and monitor between stations
- Conduct full inventory of species by habitat type, characterize habitat, assess health, look at natural fluctuations vs. human impacts
- Study impacts of commercial fishing on the resources
- Need to summarize research for decision makers and public

Boundary Redefinition

Communities in which individuals provided scoping comments regarding boundary redefinition were: Santa Barbara, Ventura, Washington, D.C., and San Luis Obispo. Comments regarding boundary redefinition were also received in written format. Specifics comments included the following:

- Expand north to Santa Rosa Creek with goal of protecting biodiversity
- Expansion to include entire Channel and Santa Catalina Island (safety, efficiency, information exchange, protect environment)
- Expand north to protect ecosystem, dynamic province, strong upwelling components, spawning grounds
- Expand to coast to make connection between ocean and land
- New sanctuary between CINMS and MBNMS, concerned about offshore oil and fishing (Central Coast Sanctuary)
- Expand to include waters from Pt. Arguello to MBNMS
- North to include Santa Lucia Bank
- Include coastal waters of Santa Barbara County and San Luis Obispo County
- Boundaries are too arbitrary and don't address threats outside sanctuary
- Question on whether boundary redefinition would change the focus/mission of CINMS
- Need to create new sanctuary from Point Conception to Point Planca
- Does not support expansion of CINMS boundaries
- How would new boundaries be selected or developed
- Support for extending CINMS to include Central Coast islands
- Boundary expansion to Nipomo Dunes and Point Sal

Military Activity

Communities in which individuals provided scoping comments regarding military activity were: Lompoc, Santa Barbara, Oxnard, Long Beach, Ventura, and San Luis Obispo. Comments regarding military activity were also received in written format. Specifics comments included the following:

- Evaluate military activity impacts on environment
- Concerned about expansion plans from Navy Sea Test Range
- Need protection from radar activity
- Military activities to avoid to the Maximum Extent Practicable any adverse impact to Sanctuary resources

- Should take into account and be ready for increase in military activity
- Concern about the impact of this technology on marine mammals
- The Navy objects to any proposed changes in the plan and regulations that would hinder their ability to train for combat readiness or weapon systems in support of national defense

Oil and Gas

Communities in which individuals provided scoping comments regarding oil and gas were: Lompoc, Santa Barbara, Oxnard, Long Beach, Ventura, Washington, D.C., and San Luis Obispo. Comments regarding oil and gas were also received in written format. Specifics comments included the following:

- Evaluate impacts from oil drilling including vessel strikes, pipes, platform blowout, other accidents, potential for increased drilling, impacts on tourism
- Concern about oil/gas leases - include language (to maximize protection of the resources) in the reauthorization of renewal of existing leases
- Opposed to oil and gas development in the Channel
- Concerned about development of 40 oil and gas leases off of SLO County
- Slow down oil lease/platform development process
- Hazardous material spills resulting from activities within sanctuary boundaries, including leaks from commercial and recreational watercraft and spills from exploration or development activity could adversely affect any species and their prey bases

Marine Reserves

Communities in which individuals provided scoping comments regarding marine reserves were: Santa Barbara, Oxnard, Long Beach, Ventura, Washington, D.C., and San Luis Obispo. Comments regarding marine reserves were also received in written format. Specifics comments included the following:

- Increase and/or establish no take zones to protect biodiversity
- Evaluate the impacts on the resources from commercial fisheries and consider no take zones as a management tool
- Marine reserves needed for the protection of sea otters/macroinvertebrates
- No take zones with limited access demonize certain activities, no take zones should be absolute, don't let anyone in except for navigation
- Need a comprehensive and complete management plan with research area - no take zones as ground truth areas for sampling
- Marine reserves issue needs to fundamentally be part of the management plan

- Propose to designate more ecological reserves within the sanctuary to protect marine biodiversity: maintain key processes in a relatively undisturbed manner, lessen impact of large scale disasters, increase understanding of marine environment, provide research opportunities

- Establish network of sea life reserves to promote biodiversity, improve scientific understanding, maintain areas of ocean as wilderness

- There are enough marine reserves in California

Sea Otters

Communities in which individuals provided scoping comments regarding sea otters were: Lompoc, Santa Barbara, Long Beach, Ventura, Washington, D.C. Comments regarding sea otters were also received in written format. Specifics comments included the following:

- Sanctuary should take a position on the expanding range of the sea otter

- Evaluate accommodation and impacts of sea otters

- Marine reserves for the protection of sea otters

- Concern about protecting sea otters

- Otters will cause more conflicts with people who rely on the resources, CINMS should be prepared

- Need to consider sea otters as functional part of original community in Channel Islands and the role of CINMS in reestablishing populations

- Concern about the impact of marine mammals on coastal and pelagic species

Other Management Issues

Communities in which individuals provided scoping comments regarding other management issues were: Lompoc, Santa Barbara, Long Beach, Ventura, Washington, D.C. Comments regarding other management issues were also received in written format. Specifics comments included the following:

- Adopt ecosystem management policies that allow for the evaluation of sanctuary regulations and programs and adaptation to new information

- Clarify the financial resources needed to meet current and future management needs

- Sanctuary should focus on habitat needs including preservation and restoration

- Should work better with other regulatory agencies in managing the resources

- Any restrictions should be easy and logical for the public

- Keep access to the sanctuary open to the public, make it smart and protect the resources for future generations

- Incorporate performance standards
- Refocus on resource protection rather than use
- Resource management should be based on a thorough understanding of ecosystem vs. species by species management
- Should be mooring systems for boaters who visit islands
- Improve coordination with federal and state agencies, and establish new partnerships and better collaboration between agencies across state/federal jurisdictions
- Need to address habitat enhancement for endangered species, should be a priority over human use
- Need to address the threat non-native species pose to endangered species
- Need to recruit stewards of the sanctuary
- Concern about tanker traffic
- First priority for management plan should be emphasis on activities within current boundaries
- Concern about public being shut out of regulatory process
- Too many stakeholders, not all needs can be met
- Concern about personalized watercraft

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APPENDIX B

PUBLIC COMMENTS AND RESPONSES

This appendix contains NOAA's responses to the substantive comments received on the Draft Environmental Impact Statement and associated Supplemental Draft Environmental Impact Statement. NOAA has summarized the comments according to the content of the statement or question put forward in the letters, emails, and written and oral testimony at the public hearings on this action. Many commenters submitted similar enough questions or statements that they could be addressed by one response. NOAA also made a number of changes in the Final Management Plan (FMP) and FEIS in response to public comments, not summarized in this Appendix, which were recommended technical updates or corrections to the documents.

The list of substantive comments and responses is preceded by the table below, which identifies each commenter and the NOAA response associated with the comment. The numbers listed in the far right column of the table correspond with the list of comments and responses following the table, and organized alphabetically by theme. In several cases, because an individual made multiple comments in a single letter or testimony, there are multiple responses from NOAA.

Table B-1. List of commenters and associated NOAA responses

Last Name, First Name	Representing	Comment Date	Comment / Response Number(s)
Andrews, Jimbeau	Mobile Media Now, Inc. and Aloha Films Group, Inc.	7/11/2006	197, 201, 206, 218, 219
Bacon, Capt. David	Recreational Fishing Seat Member, Sanctuary Advisory Council	5/17/2006	20, 57, 126, 170, 218, 265, 277
Bacon, Capt. David	Chair, Recreational Fishing Working Group, Sanctuary Advisory Council	7/21/2006	54
Bauer, John C.		7/15/2006	197, 198, 218
Belew, Keith		7/12/2006	197, 207, 219, 206
Berge, John	Vice President, Pacific Merchant Shipping Association	5/28/2008	72, 73
Black, Dianne M.	Chair, Sanctuary Advisory Council	5/30/2008	41, 68, 87, 280
Blackburn, Joseph		7/12/2006	197, 201, 219, 218
Blazej, Nova	Manager, Environmental Review Office, U.S. Environmental Protection Agency Region IX	4/30/2008	68
Bratcher, Voni		7/24/2006	197, 219
Briggs, Roger W.	Executive Officer, Central Coast Region, California Regional Water Quality Control Board	7/21/2006	287, 288
Broddrick, L. Ryan	Director, California Department of Fish and Game	7/10/2006	1, 66, 130, 171, 273
Cabugos, Paulette	Chumash Community Member, Sanctuary Advisory Council	7/21/2006	42, 44, 45, 46

Last Name, First Name	Representing	Comment Date	Comment / Response Number(s)
Capps, Lois	U.S. House of Representatives, 23rd District (CA)	7/21/2006	13, 63, 130, 236, 262, 263, 282, 287
Chrisman, Mike	Secretary for Resources, State of California Resources Agency	7/19/2006	67, 130, 201, 220
Chumash Community Working Group	Sanctuary Advisory Council		[Please see "Cabugos, Paulette."]
Cisneros, Art	Chumash	6/29/2006	32, 52
Coleman, WD		4/25/2008	68, 281
Conservation Working Group	Sanctuary Advisory Council		[Please see "Krop, Linda."]
Cordero, Roberta	Chumash Community	6/29/2006	32, 33, 34, 35, 36, 37, 38, 39, 42, 43, 44, 47, 48, 49, 52
Curland, Jim	Marine Program Associate, Defenders of Wildlife	7/21/2006	130, 135, 136, 266, 267, 268, 269, 289
Curtis, Taylor		7/16/2006	197, 218, 219
Donaldson, John	Personal Watercraft Industry Association	6/27/2006	195, 196, 200, 201, 202, 208, 210, 216, 217, 219
Downie, Jerrald		7/19/2006	53, 54, 77, 121, 133, 134, 165
Dry, Rick		7/21/2006	197, 199, 201
Dye, Steve	American Watercraft Association	6/30/2006	195, 197, 201, 202, 203, 219
Franklin, Stephan		7/20/2006	53, 54, 77, 121, 133, 134, 165

Last Name, First Name	Representing	Comment Date	Comment / Response Number(s)
Gabriel, Chris		4/8/2008	68, 71
Gaffney, Kaitilin	Pacific Ecosystem Protection Director, Ocean Conservancy		Comments submitted jointly with John Kaltenstein. Please see "Kaltenstein, John."
Galipeau, Jr., Russell E.	Superintendent, Channel Islands National Park, National Park Service, United States Department of the Interior	7/21/2006	77, 78, 130, 137, 220, 221
Gibbs, Michelle		6/29/2006	132, 139
Grifman, Phyllis	Public At-Large Alternate, Sanctuary Advisory Council	7/21/2006	118, 136, 172, 257, 261, 304
Gwinn, Beth		6/29/2006	4, 5, 9, 11, 78, 115, 192
Kaltenstein, John	Clean Vessels Campaign Manager, Friends of the Earth	5/30/2008	68, 69, 70, 118, 120
Kaye-Carr, Josh and Staci		5/30/2008	68
Healey, Maureen	Executive Director, Personal Watercraft Industry Association	7/21/2006	195, 196, 200, 203, 210, 219
Hedger, Ray	President, Tri-State Personal Watercraft Club	7/20/2006	197, 201, 207, 209
Helms, Gregory	The Ocean Conservancy	6/29/2006	88, 92, 161, 169, 276
Helms, Gregory	Program Manager, Channel Islands, The Ocean Conservancy	7/20/2006	55, 60, 108, 136, 139, 222, 233
Hoeflinger, Chris	Commercial Fishing Member, Sanctuary Advisory Council	7/20/2006	1, 3, 134, 140, 141, 173, 274
Huglin, Greg		7/20/2006	197, 219

Last Name, First Name	Representing	Comment Date	Comment / Response Number(s)
James, Duane	Manager, Environmental Review Office, Communities and Ecosystems Division, U.S. Environmental Protection Agency	7/6/2006	130, 221, 283
Jenkin, Paul		6/27/2006	204, 278
Kasaback, Lance		7/13/2006	219
Kenney, Joe		7/11/2006	197
King, Jon		7/20/2006	142
Knowlton, Jim	Associate Producer, Jean-Michel Cousteau's Ocean Futures Society	7/20/2006	4, 9, 130, 198, 220
Krop, Linda	Chair, Conservation Working Group, Sanctuary Advisory Council	7/7/2006	4, 6, 13, 14, 15, 16, 18, 21, 23, 24, 25, 58, 61, 63, 65, 67, 78, 79, 80, 92, 93, 94, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 122, 124, 130, 143, 162, 176, 178, 180, 182, 183, 184, 189, 190, 191, 204, 220, 221, 222, 226, 228, 229, 230, 237, 239, 241, 245, 259, 262, 270, 279, 284, 286, 287, 290, 291, 292, 296, 297, 298, 299, 300, 304, 307
Krop, Linda	Environmental Defense Center	7/20/2006	4, 7, 8, 9, 10, 11, 78, 118, 130, 136, 162, 176, 221, 260, 262, 275, 295
Krop, Linda	Environmental Defense Center	5/29/2008	68, 86, 89, 285
Laine, Randy		7/11/2006	197, 206, 219
Lopez, Marcus	Barbareno Chumash Council	6/29/2006	35, 36, 37, 38, 39, 42, 43, 47, 48, 49

Last Name, First Name	Representing	Comment Date	Comment / Response Number(s)
Manson, Lawrence	Surfrider Foundation	6/27/2006	210, 220
Marzolla, Michael		7/22/2006	95, 96, 97, 98, 99, 144
McCaffery, Jeff		7/11/2006	218
McCrea, Merit	Recreational Fishing Alternate, Sanctuary Advisory Council	7/20/2006	3, 26, 53, 54, 77, 90, 91, 99, 121, 133, 134, 145, 146, 163, 164, 165, 166, 167, 174, 175, 199, 205, 217
McGee, Lindsay		4/12/2008	68, 281
McIsaac, Donald O.	Executive Director, Pacific Fishery Management Council	6/29/2006	1, 27, 57, 169, 176, 194, 211, 223, 227, 270, 272
Meester, Dianne L.	Chair, Sanctuary Advisory Council	7/21/2006	3, 13, 15, 16, 23, 34, 39, 40, 43, 44, 52, 54, 55, 57, 59, 77, 78, 81, 82, 90, 91, 93, 105, 106, 107, 109, 110, 118, 120, 145, 163, 164, 165, 167, 170, 175, 176, 190, 193, 199, 204, 217, 220, 221, 222, 233, 234, 238, 239, 240, 273, 274, 284, 286, 297, 300, 301, 305, 306
Miller, Chris	Vice President, California Lobster and Trap Fisherman's Association	7/20/2006	54, 125, 127, 128, 147, 148, 149, 165, 168, 231, 238, 258
Miyabara-McCaskey, Michael		7/9/2006	197, 219
Murray, Peter		7/11/2006	197
Olbricht, Arno		7/11/2006	197, 219
OPENPRO (email username)		7/12/2006	215

Last Name, First Name	Representing	Comment Date	Comment / Response Number(s)
Ovetz, Robert	Executive Director, Seaflow		Comments submitted jointly with John Kaltenstein. Please see "Kaltenstein, John."
Pearson, Dan H.	Pt. Mugu Wildlife Center	6/27/2006	83, 100, 134, 150, 220, 271, 293
Peña, Oscar	General Manager, Ventura Port District	6/27/2006	129, 131, 151
Peralta, Lonnie	FXF Productions, Inc.	7/11/2006	197
Polefka, Shiva	Environmental Defense Center	6/29/2006	110, 112, 116, 132, 152, 303
Polefka, Shiva	Environmental Defense Center		Comments submitted jointly with Linda Krop. Please see "Krop, Linda" datad 5/29/2008.
Polhemus, Darrin	Chief, Division of Water Quality, State Water Resources Control Board	7/21/2006	61, 67, 221, 176
Polhemus, Darrin	Deputy Director, Division of Water Quality, State Water Resources Control Board	5/30/2008	68
Purdon, Sandy	Chairman, California Boating and Waterways Commission	7/13/2006	195, 196, 202, 210, 212, 213, 217, 219
Redmond, Kira	Executive Director, Santa Barbara Channelkeeper	5/29/2008	68, 86, 118, 120, 122, 123
Research Activities Panel	Sanctuary Advisory Council		[Please see "Warner, Robert."]
Robertson, Gordon C.	Vice President, American Sportfishing Association	6/20/2006	125, 185, 186, 187, 188
Sachau, Barb		5/30/2008	85
Sanctuary Advisory Council & Working Groups	Channel Islands National Marine Sanctuary		[Please see "Meester, Dianne," "Cabugos, Paulette," "Krop, Linda," and "Warner, Robert"]

Last Name, First Name	Representing	Comment Date	Comment / Response Number(s)
Sanders, Alan	Los Padres Chapter, Sierra Club	6/27/2006	16, 28, 152, 153, 178, 204, 224
Sazama, Terry		7/11/2006	197, 218
Schmidt, Kira	Executive Director, Santa Barbara Channelkeeper	6/29/2006	58, 61, 65, 79, 120, 122, 176, 220, 221, 284, 303, 307
Schmidt, Kira	Executive Director, Santa Barbara Channelkeeper	7/14/2006	58, 61, 65, 79, 118, 120, 122, 176, 220, 221, 284, 287, 295, 307
Schroeder, Donna	Executive Director, Channel Islands Marine Sanctuary Foundation	7/21/2006	101, 102, 154, 172, 181, 238, 245, 247, 248, 250, 251, 252, 264, 302
Selvin, Bob		7/19/2006	53, 54, 77, 121, 133, 134, 165
Shore, Teri	Clean Vessels Campaign Director, Bluewater Network	7/5/2006	56, 64, 78, 81, 84, 86, 136, 204, 220
Shore, Teri	Program Director, Turtle Island Restoration Network		Comments submitted jointly with John Kaltenstein. Please see "Kaltenstein, John."
Stenberg, Ken R.		5/28/2008	85
Sullivan, Frank		7/19/2006	121, 165
Swanhuyser, Jesse		6/27/2006	9, 61, 132, 155, 204, 225
Taylor, Willie R.	Director, Office of Environmental Policy and Compliance, Office of the Secretary, United States Department of the Interior	7/24/2006	17, 22, 29, 30, 62, 179, 235, 285, 294
Teufel, Cassidy	Federal Consistency and Energy & Ocean Resources Units, California Coastal Commission, State of California - The Resources Agency	7/21/2006	5, 9, 11, 12, 19, 67, 105, 156, 157, 158, 159, 176, 220, 239, 286, 305, 306

Last Name, First Name	Representing	Comment Date	Comment / Response Number(s)
Thompson, Ted	Sr. Vice President, Technical and Regulatory Affairs, Cruise Lines International Association	5/30/2008	2, 62, 74, 75, 76
Treece, Andrea A.	Staff Attorney, Center for Biological Diversity		Comments submitted jointly with John Kaltenstein. Please see "Kaltenstein, John."
Tsuneyoshi, Raynor	Director, California Department of Boating and Waterways	6/27/2006	177, 195, 197, 212, 213, 216, 219
Tsuneyoshi, Raynor	Director, California Department of Boating and Waterways	6/29/2006	201, 207, 214
Tsuneyoshi, Raynor	Director, California Department of Boating and Waterways	7/7/2006	195, 196, 202, 212, 217, 219
Ward, Ray	Barbareno Chumash Council	6/29/2006	50, 51, 52
Warner, Robert	Chair, Research Activities Panel, Sanctuary Advisory Council	7/19/2006	25, 31, 61, 103, 104, 109, 110, 130, 160, 232, 240, 242, 243, 244, 246, 249, 253, 254, 255, 256, 286
Watson, Dave		7/9/2006	197, 201, 218, 219
Williams, Douglas		5/28/2008	68

WHERE TO FIND RESPONSES TO COMMENTS – LISTED ALPHABETICAL BY THEME

ABANDONING MATTER

ABANDONING MATTER – FISHING GEAR

1. Comment: The proposed prohibition on abandoning is too broad and may cause an unnecessary burden on existing lawful fishing activities by appearing to render illegal the inadvertent loss of fishing gear. The proposed regulation should clarify the specific materials and situations prohibited, or exempt fishing gear lost during lawful fishing operations – if the owner or operator attempts to recover the gear with the equipment available to them at the time of the loss.

Response: In the proposed rule's summary of regulatory amendments, NOAA has stated that "abandoning" refers to "leaving without intent to remove." NOAA is not providing an exception for lost fishing gear. However, NOAA would consider the efforts made by fishermen to retrieve any deployed fishing gear in determining whether the loss of fishing gear constituted the abandonment of matter on or in the submerged lands of the Sanctuary.

ABANDONING MATERIAL – GENERAL

2. Comment: The abandoning prohibition is overly broad and could be a detriment to safety of life at sea in that the threat of penalty may cause a master to delay abandonment of his sinking vessel beyond what is prudent and which could result in unnecessary loss of life. This section of the regulations should be much more narrowly drafted to allow for a master's judgment in extremis.

Response: CINMS's new regulation (by this we mean the FEIS preferred alternative) would include an exception for "an activity necessary to respond to an emergency threatening life, property, or the environment."

ABANDONING MATTER – ABANDONED VESSELS VS. HISTORICAL RESOURCES

3. Comment: The proposed abandoning prohibition eliminates continuation of a historic record by making it illegal to leave historic vessels in the Sanctuary after they have sunk. NOAA should establish guidelines delineating the difference between an abandoned vessel and an historical or archaeological resource.

Response: NOAA does not automatically consider newly sunken vessels as historical resources to be protected. The extent to which removal of a sunken vessel would be required is based on several factors, including guidelines set by National Historic Preservation Act (NHPA) criteria (16 USC 470 *et seq.*) for determining historical significance.

ACOUSTIC IMPACTS

ACOUSTIC IMPACTS – GENERAL ACTION RECOMMENDATIONS

4. Comment: The FMP's Resource Protection Action Plan should include an acoustics strategy that identifies underwater noise as an issue, explains potential sources of noise (*e.g.*, seismic testing and sonar) and their effects on marine life, and explains NOAA's plans for noise evaluation and response in the Sanctuary.

Response: The FMP's Resource Protection Action Plan identifies human-induced acoustic impacts as a resource protection issue, explains potential sources of noise and their potential effects on marine life, and explains how NOAA is evaluating and responding to this issue in the Sanctuary.

5. Comment: Given increasing shipping traffic and its associated noise in the CINMS region, the FMP's Conservation Science Action Plan should provide strategies for tracking and/or quantifying vessel traffic through the Sanctuary and, if needed, mitigating or minimizing ship noise.

Response: NOAA has added to the FMP's Conservation Science Action Plan a new Strategy CS.8 on Automated Identification System (AIS) Vessel Tracking. This strategy explains NOAA's long-term plan for large vessel tracking within and around the Sanctuary. See also FMP Strategy CS.3 for related information on acoustic monitoring in the Sanctuary, and the FMP's Resource Protection Action Plan (Description of the Issues) for related information on addressing human-induced acoustic impacts.

6. Comment: CINMS should formally consider energetic discharges from human activities as pollutants in the same manner in which organic and chemical discharges are considered. Several precedents for this already exist, including California state law (the California Thermal Plan), federal law (the Clean Water Act), and international law (UN Convention on the Law of the Sea).

Response: While NOAA does not consider noise discharge as a "pollutant," any impacts resulting from noise on marine mammals and other endangered species are regulated under the Marine Mammal Protection Act and the Endangered Species Act. At this time, NOAA believes these measures are sufficient to address the threat of human-induced sound on these sensitive species.

7. Comment: NOAA should establish a voluntary "speed limit" for commercial ship traffic passing through or near the Sanctuary during blue and fin whale inhabitation to reduce the noise impacts on these species.

Response: Since 2007, NOAA and the U.S. Coast Guard have issued Local Notices to Mariners containing a request that large vessels transiting the Santa Barbara Channel voluntarily reduce their speed to ten knots or less when aggregations of large cetaceans are present. NOAA and the U.S. Coast Guard may issue future notices as conditions warrant them. Although the rationale for these notices is to help reduce the risk of ship strikes on whales, ancillary benefits of reduced ship speeds generally include reduced vessel noise.

8. Comment: NOAA should consult with the Minerals Management Service (MMS) on future proposed seismic survey activities in the Channel and with the Navy to ascertain the likelihood of any active sonar exercises in range of the CINMS to ensure they cause minimal disruption to the migration or reproduction of Sanctuary species.

Response: Section 304(d) of the NMSA requires any federal agency to consult with the NMSP on activities that are likely to destroy, cause the loss of, or injure any Sanctuary resource (whether or not those activities are conducted within a national marine sanctuary). This would of course apply to both seismic and sonar activities. Furthermore, regarding seismic activities within the Sanctuary, CINMS regulations prohibit exploring for, developing, or producing hydrocarbons.

ACOUSTIC IMPACTS – REGULATIONS

9. Comment: NOAA should create CINMS noise regulations and/or ban sonar testing to help protect Sanctuary wildlife, and/or make the enter-injure clause of the discharge regulation applicable to noise pollution.

Response: NOAA and its partners are researching underwater noise in the Sanctuary. Currently, the available site-specific acoustic data is insufficient to justify the need for more stringent regulations on underwater noise than those promulgated by NOAA Fisheries pursuant to the Marine Mammal Protection Act (MMPA). Except in a small grandfathered lease area, CINMS regulations preclude seismic exploration for hydrocarbons within the Sanctuary, as they prohibit exploring for, developing, or producing hydrocarbons within the Sanctuary. Any activities that may exceed a certain noise threshold are subject to rigorous review under NOAA Fisheries' MMPA permit authority, which includes mitigation measures when deemed necessary.

While NOAA is not pursuing special noise regulations for CINMS at this time, NOAA will continue to use its authority under section 304(d) of the NMSA (16 U.S.C. 1434(d)) to help protect marine mammals from the impacts of noise. Section 304(d) of the NMSA requires any federal agency to consult with the NMSP on activities that are likely to destroy, cause the loss of, or injure any Sanctuary resource. This consultation requirement requires NOAA to provide recommendations to these agencies to protect Sanctuary resources, including marine mammals. If an agency fails to follow a recommendation and its action results in injury to a Sanctuary resource, the agency must restore or replace the Sanctuary resource. In addition, if a noise-producing project in not authorized by NOAA Fisheries under its MMPA authority and harms marine mammals within the Sanctuary, the CINMS's new regulation prohibiting the take of marine mammals, seabirds, and sea turtles would apply.

10. Comment: NOAA staff should advocate for domestic and international attention to and action on the current gaps in understanding and regulation of underwater noise.

Response: As a federal agency, under federal law NOAA staff may not advocate for legislative action. However, research and monitoring on underwater noise in the Sanctuary is shared within NOAA and as such can influence Executive Branch actions and decision-making related to this issue. NOAA staff also help raise international attention to noise impacts by participating in and sharing knowledge at conferences on this issue. For example, NOAA sponsored a symposium with the shipping industry on the topic of ship-quieting technology in 2004, and again in May 2007.

ACOUSTIC IMPACTS – RESEARCH AND MONITORING

11. Comment: The FMP should explain NOAA's plans for noise research and monitoring in the Sanctuary, which should include: promoting research on anthropogenic noise impacts on Sanctuary resources; documenting and improving understanding of Sanctuary baseline and new acoustic conditions; identifying significant sources and levels of noise within the Sanctuary; and promoting dialogue and collaboration between the Sanctuary, the shipping industry, and other relevant regional and national agencies.

Response: Increasing research efforts, such as those recommended within the National Academies' National Research Council's recent reports on the impacts of noise on marine mammals, will assist NOAA in continuing to evaluate the agency's management responses to this issue. NOAA has revised the FMP's Conservation Science Action Plan to include details on current and potential future acoustic research and monitoring plans in the CINMS. In addition, NOAA has addressed promoting dialogue and collaboration between relevant agencies and the shipping industry in the Resource Protection Action Plan (see the Description of the Issues section on Human-induced Acoustic Impacts). NOAA's Acoustics Program, based at the NOAA Headquarters Office, is investigating all aspects of marine animal acoustic communication, hearing, and the effects of sound on behavior and hearing in protected marine species. For additional information, see http://www.nmfs.noaa.gov/pr/acoustics/.

12. Comment: The FMP's Conservation Science Action Plan should include a "stranding strategy" for addressing potential noise induced marine mammal stranding events. It should address: funding, monitoring, data reporting (including from stranding, necropsies, and noise events), and public involvement.

Response: NOAA has not added a stranding strategy to the Conservation Science Action Plan. However, the Resource Protection Action Plan (Description of the Issues section on Marine Mammal Strikes) describes CINMS's role in responding to and reducing the risk of future stranding events (*e.g.*, those caused by ship strikes) in the Sanctuary. The Action Plan reflects that in 2008, CINMS, NOAA Fisheries, and the U.S. Coast Guard, with input from the Sanctuary Advisory Council, developed a Prevention and Emergency Response Plan for Reducing Ship Strikes on Blue Whales and Other Large Cetaceans in the CINMS and Santa Barbara Channel. This prevention and response plan helps NOAA and the U.S. Coast Guard respond to stranding events and helps the agencies coordinate with partners authorized to assist including the Santa Barbara Museum of Natural History, and the Santa Barbara Marine Mammal Center. NOAA Fisheries manages marine mammal stranding events and administers the Marine Mammal Stranding Network program. This program addresses funding for stranding teams, monitoring marine mammal stranding events, reporting on stranding causes (including those from acoustics), and managing public involvement in necropsies. In addition, NOAA Fisheries administers the Marine Mammal Protection Act and Endangered Species Act, and would be responsible for acquiring information on all possible causes of stranding events. With regard to monitoring for stranding events, the Sanctuary's Aerial Monitoring and Spatial Analysis Program (SAMSAP) provides an important stranding detection capability that provides for an improved ability to estimate time, location, and possible cause of mortality.

13. Comment: NOAA should incorporate into the Conservation Science Action Plan the Advisory Council acoustic report's research and monitoring recommendations

Response: NOAA has incorporated the report by referencing it and a summary of its findings in the FMP Resource Protection Action Plan's Description of the Issues section. Additionally, a description of acoustic monitoring, which was recommended in the report, has been added to the Conservation Science Action Plan's list of monitoring activities CINMS intends to support (Strategy CS.3). NOAA has also referred to specific research and monitoring recommendations within relevant activities in strategies CS. 3, and CS.8.

AERIAL MONITORING

14. Comment: The Sanctuary Aerial Monitoring and Spatial Analysis Program (SAMSAP) program should be explicitly linked to the Conservation Science Program so that SAMSAP's capabilities can be analyzed with respect to more specific science and monitoring needs. For example, SAMSAP could provide a current spatial dataset depicting marine mammal and bird hotspots, and areas of concentrated use of large vessels, personal watercraft, squid boat lighting, sources of major acoustic emanations, etc.

Response: In the past, due to limited resources, SAMSAP has been predominantly a data collection program with only limited analyses taking place on an as-needed and time allowed basis. Since the draft management plan was released, NOAA has devoted more resources to SAMSAP and in depth analyses are taking place with both recently collected data and the full SAMSAP historical database. For example, NOAA analyzed SAMSAP vessel traffic data used in socioeconomic impact studies related to marine zoning. NOAA is also analyzing changes in visitor use patterns, and in partnership with the Scripps Institute of Oceanography is combining data from SAMSAP, acoustic monitoring, and the regional Automated Identification System (which tracks vessel traffic) to study the impacts of vessel traffic noise on large cetaceans. Given available funding and resources, SAMSAP will continue to be increasingly

used as a tool to assist in implementation of the strategies in the FMP's Conservation Science Action Plan.

AIRCRAFT

15. Comment: NOAA should remove the language regarding disturbing seabirds or marine mammals from the prohibition on disturbing seabirds or marine mammals via operating aircraft below 1000 ft within one nmi of the Islands, thereby prohibiting the activity itself without the enforcement challenge of proving disturbance.

Response: NOAA is currently consulting with the Federal Aviation Administration, the primary agency of the U.S. Government with authority to regulate safe and efficient use of U.S. airspace, to determine the best approach to regulating impacts of aircraft on Sanctuary resources. If removing the language in the referenced prohibition is determined to be appropriate, NOAA will revise its regulations accordingly.

16. Comment: NOAA should justify the one nmi limitation for the overflight disturbance regulation based on information about the location and seabird and marine mammal concentrated use areas within the Sanctuary (such as emergent rocks). If one of the purposes of limiting overflights is to protect seabirds and marine mammals, it would seem that they will be impacted beyond one nmi of the Islands and the regulation should apply to the entire Sanctuary.

Response: Some small offshore rocks beyond one nmi from San Miguel Island and Santa Rosa Island are emergent during lower periods of the tidal cycle. However, the presence of these rocks is ephemeral because most are submerged during the remainder of the tidal cycle, some are consistently awash from wave action, and others may be completely submerged during neap tide cycles when tides are relatively weak. Hence, the role of such rocks as nesting, breeding, or permanent haul out habitat is limited. Low aircraft overflights (below 1000 feet) within these more remote offshore areas is limited, and NOAA does not at this time regard these areas as needing the specific protection provided by this regulation. However, all aircraft flight is also subject to the prohibition on unauthorized take of marine mammals, seabirds and sea turtles (Prohibition 7), which applies throughout the entire Sanctuary.

ALTERNATIVE ENERGY

17. Comment: NOAA should include in the FEIS a description of the Energy Policy Act of 2005.

Response: NOAA has added information about the Energy Policy Act of 2005 to the FEIS cumulative effects section, and to the FEIS discussion of federal law pertaining to offshore energy sources and mineral exploration and development.

AQUACULTURE

18. Comment: The FMP must provide clear, specific, strategic guidelines to CINMS staff to carry out resource protection responsibilities with regard to open finfish aquaculture, including consulting with prospective fish farm operators and permitting agencies, and maintaining adequate enforcement effort to ensure that offshore aquaculture activities, even if located outside Sanctuary boundaries, do not violate CINMS regulations such as the discharge prohibition's "enter-and-injure" clause, and the prohibition on introduction of species.

Response: The FMP does not contain guidelines dedicated to aquaculture. However, a number of management tools already in place, such as the permit process and consultation requirements, provide

CINMS staff with a robust means of addressing any potential issues regarding open ocean finfish aquaculture in the Sanctuary. In addition, CINMS existing regulations prohibit, for example, discharges in the Sanctuary, and the proposed regulations would prohibit introducing introduced species into the Sanctuary. If offshore aquaculture activities are proposed in the Sanctuary region, NOAA's ONMS and NOAA Fisheries would work closely with the California Coastal Commission, California Department of Fish and Game, and other relevant regulatory agencies on analyzing the associated potential impacts and their effects on the Sanctuary. NOAA will also use the Sanctuary Advisory Council's 2007 report and recommendations on open ocean aquaculture, in support of any future management decisions on this issue in the Sanctuary. Regarding maintaining enforcement effort, see the responses to comments 118 and 120.

19. Comment: NOAA should develop management strategies for addressing and mitigating potential impacts from aquaculture on the Sanctuary's marine resources. NOAA should also analyze the adverse impacts to marine resources and water quality from finfish aquaculture farms, including genetic pollution from escaped fish, the introduction and propagation of fish diseases and parasites, the discharge of nutrients, antibiotics and other chemicals, the use of anti-predation devices and the potential for space conflicts with existing commercial and recreational activities.

Response: NOAA will continue to track the wide range of research projects (and their associated results) currently underway along the west coast of the United States and elsewhere analyzing the impacts of aquaculture. NOAA would apply the results from these research efforts, as necessary and appropriate, in decisions it may make regarding any future aquaculture activities in the Sanctuary. Regarding management strategies for addressing potential impacts from aquaculture, see the response to comment 18.

ARTIFICIAL REEFS

20. Comment: The prohibition on altering the seafloor may conflict with existing artificial reef programs if the Sanctuary is extended to the mainland coast.

Response: NOAA is not proposing any changes to the CINMS boundary at this time. The prohibition on altering submerged lands of the Sanctuary precludes installation of an artificial reef without a CINMS permit. Proposals to construct artificial reefs in CINMS will be considered, as before, in accordance with the "Policy Statement of the National Marine Sanctuary Program: Artificial Reef Permitting Guidelines." CINMS permit regulations would require an NMSP determination that any proposed artificial reef: a) furthers the understanding of Sanctuary resources and qualities; b) furthers the educational value of the Sanctuary; c) furthers salvage or recovery operations in or near the Sanctuary in connection with a recent air or marine casualty; d) assists in the management of the Sanctuary; or e) furthers salvage or recovery operations in connection with an abandoned shipwreck in the Sanctuary. For more information on the procedures and issuance criteria for Sanctuary permits, see 15 CFR part 922.

21. Comment: NOAA should prohibit rigs-to-reefs projects within Sanctuary waters, and should consult with project applicants and permitting agencies before such projects are allowed outside Sanctuary boundaries if they have any potential to negatively affect Sanctuary resources.

Response: Because there are both a national policy guiding the consideration of artificial reefs and other CINMS regulations relevant to artificial reefs in the Sanctuary (see the response to comment 20), NOAA is not specifically addressing rigs-to-reefs projects in the CINMS regulations. In addition, there are currently no oil platforms in the Sanctuary. If in the future an applicant proposes a rigs-to-reefs project outside the Sanctuary, CINMS staff would consult with all relevant permitting agencies as part of the process to best understand any potential impacts to the Sanctuary from such a proposal. Federal agency actions, including private activities authorized by licenses, leases, or permits, that are likely to destroy,

cause the loss of, or injure a Sanctuary resource are subject to consultation with NOAA per section 304(d) of the NMSA.

22. Comment: NOAA should provide an exception to the abandoning prohibition for materials intended to be used for artificial reefs, especially if subsequent Sanctuary boundary changes cause an existing platform(s) on the Pacific OCS to be included within the Sanctuary.

Response: As explained in the response to comment 20, NOAA has developed Artificial Reef Permitting Guidelines. At this time, NOAA is not adding a reef materials exception to the regulation on abandoning matter in the Sanctuary because NOAA prefers to evaluate the efficacy of artificial reef proposals on a case-by-case basis rather than to provide a blanket exception that would allow any artificial reef project anywhere within the Sanctuary.

BOUNDARY EVALUATION

23. Comment: The FMP/FEIS should be updated to note that the Biogeographic Assessment has been completed, and should also explain that the assessment ranked boundary concept 1 first for ecological significance, and boundary concept 2 second.

Response: Text on the completion of the Sanctuary's biogeographic assessment has been added to the FMP's Boundary Evaluation Action Plan, the FMP's Appendix D, and the Introduction of the FEIS. For details about the findings of the assessment, including details about the various boundary concepts and their rankings, see http://ccma.nos.noaa.gov/products/biogeography/cinms/.

24. Comment: Boundary Concept 1 best meets the goals and objectives of the National Marine Sanctuaries Act and the CINMS, is the only one that truly meets the ecosystem protection goals of the Act, provides clear and effective management, facilitates increased public participation and support for the Sanctuary, provides more meaningful education and research about marine resources and habitats, ensures greater protection from harmful impacts, provides a coastal interface that is part of the Channel Islands ecosystem, provides additional protection from offshore oil and gas development, and will result in partnerships that will increase marine resource and water quality protection.

Response: As stated in the FMP's Appendix D ("Supporting Information on Boundary Evaluation'), NOAA is not considering any changes to the CINMS boundary as part of this management plan review. However, NOAA will further analyze the boundary concepts in a separate process sometime in the future. This process will include public review and comment in accordance with legal requirements.

25. Comment: NOAA should begin the environmental review process for boundary change alternatives now or as soon as the management plan process is finalized.

Response: As indicated in the FMP's Boundary Evaluation Action Plan, NOAA will further analyze the boundary concepts in a future environmental review process.

26. Comment: NOAA might garner a lot more support for Sanctuary boundary expansion by proposing to limit oil and gas activities while supporting pre-existing, sustainable, commercial and recreational uses, as opposed to re-allocating the natural resources within the Sanctuary.

Response: When NOAA considers Sanctuary boundary expansion, it will evaluate a wide variety of potential threats to and uses of Sanctuary resources, as well as various management measures that best address these issues. When designating new or expanding existing sanctuaries, NOAA will evaluate oil and gas development, as well as other commercial and recreational uses. NOAA will consider the

impacts of these uses on Sanctuary resources, as well as the impacts of CINMS management measures on users.

27. Comment: During the future consideration of CINMS boundary expansion, NOAA should allow for enough public review of this action to encompass two meetings of the Pacific Fishery Management Council (PFMC) and allow for full PFMC deliberation and comment development.

Response: NOAA is aware of the PFMC decision-making process and will consider providing a public review period that encompasses two PFMC meetings.

28. Comment: NOAA should address the fact that industrialized uses could have the prospect of limiting boundary expansion.

Response: NOAA believes it is premature to include in the FMP and FEIS conclusive statements about how CINMS boundary alternatives and industrialized uses may relate to one another. NOAA will analyze the relationship between industrialized uses and Sanctuary boundary alternatives in a future environmental review process.

29. Comment: NOAA should indicate the number of comments received that were not in favor of boundary expansion.

Response: NOAA has revised text in the FMP to indicate the number of scoping comments received that did not support an expanded Sanctuary boundary.

30. Comment: The NCCOS Biogeographic study should not be described as providing any new information about marine species because it using existing information.

Response: Although new data was not collected for the NCCOS biogeographic study, it integrated data sets from various sources and provided new statistical and spatial analyses that characterize biological and oceanographic patterns of the Channel Islands marine region.

31. Comment: If incorporation of biodiversity and protection of entire ecosystems is a goal in boundary reformulation, then the boundaries should be extended because they do not correspond well to existing marine ecosystem extents.

Response: Once NOAA determines that an evaluation of the CINMS boundary is appropriate, several factors will be incorporated into the associated environmental analysis, including the spatial extent of regional ecosystems and areas of complex biodiversity.

CHUMASH

CHUMASH – GENERAL

32. Comment: NOAA should add to the management plan information about the spirituality and spiritual energy of the Channel Islands, and the Chumash connection to surrounding waters.

Response: NOAA has added text to the FMP Human Setting section, the FMP Maritime Heritage Resources Action Plan, and the FEIS Affected Environment/Maritime Heritage Resources section to emphasize the spiritual significance of the Channel Islands to Chumash people.

33. Comment: Members of the Chumash community, not NOAA, should initiate any joint paddling excursions directly with the Makah Nation.

Response: NOAA has revised the FMP's Maritime Heritage Action Plan to clarify that NOAA's intent is not to initiate paddling excursions, but rather to support such excursions initiated by Chumash and other partners.

34. Comment: Information about submerged Chumash cultural resources should be referenced to and provided by Chumash scholars and Chumash people.

Response: In the FMP and FEIS, NOAA has upheld the standard of using the best available scientific information, including the best available anthropological and archeological information regarding submerged Chumash cultural resources. CINMS staff consulted with a Chumash community member and expert to improve referencing and ensure accuracy.

35. Comment: It is important that DMP p. 28 states that, "Archaeologists suggest the Sanctuary may have once been the site of Chumash villages...," because there are sites now submerged due to changing sea level.

Response: Comment noted.

36. Comment: The management plan should explain how Chumash people are involved in monitoring artifacts, and what federal, state and local regulations pertain to Chumash monitoring of artifacts.

Response: NOAA has added an activity to FMP Strategy MH.4 that describes how the NOAA 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 practices regarding protection and handling of Chumash artifacts.

37. Comment: NOAA should increase funding and planned efforts for Strategy MHR.6 on Promoting Public Education of Chumash Native American History.

Response: NOAA will continue to contribute staff time and vessel support toward the implementation of this Strategy (now referred to as MH.6), and will continue to support the Sanctuary Advisory Council's Chumash Community Working Group. NOAA will allocate additional resources as funding allows.

38. Comment: NOAA should hire Chumash staff to properly implement the Maritime Heritage Resources Action Plan.

Response: Should NOAA add any new staff positions at CINMS, such positions must be open to all qualified individuals. In addition, NOAA encourages individuals from all local communities to participate in the Sanctuary's Maritime Heritage Resources Volunteer Program (see strategy MH.2).

39. Comment: NOAA should establish an internship for Chumash high school and/or college students.

Response: NOAA initiated a Chumash internship at the Sanctuary in 2008. NOAA values this internship for improving coordination and partnership building between CINMS and the Chumash community, and as a means to introduce Chumash students to marine conservation education and resource protection professions. NOAA looks forward to continuing the internship as resources allow.

40. Comment: NOAA should separate shipwreck information from Chumash cultural information in the Maritime Heritage Resources Action Plan.

Response: The majority of the strategies contained in this action plan bear relevance to researching, protecting, and conducting outreach and education not only on shipwrecks, but also on Chumash cultural sites and artifacts. However, given that NOAA regards Chumash culture, past and present, as a special part of the Sanctuary's maritime heritage, the FMP's planned activities to support education about Chumash heritage are contained in a separate strategy.

41. Comment: A cave in Oregon has been recently determined to house the oldest human remains found in North America; therefore the reference to Santa Rosa Island as such should be revised.

Response: NOAA has revised FMP and FEIS text accordingly.

CHUMASH – INCLUSION ACROSS TRIBAL, POLITICAL, AND SOCIAL GROUPINGS

42. Comment: The documents should reflect that there are many Chumash tribal, political and social groupings. The Chumash Maritime Association should not be the only Chumash group considered in DMP Strategy MHR.6 activities on Promoting Public Education of Chumash Native American History.

Response: NOAA has added information about various Chumash bands, tribal, political, and social groupings to the FMP Human Setting section, and elsewhere within the FMP/FEIS documents. NOAA has listed the Sanctuary Advisory Council's Chumash Community Working Group as the Chumash community partner in Strategy MH.6 activities. The Chumash Community Working Group is open to membership from the entire Chumash community, and its purpose is to advise the Sanctuary Advisory Council, and in turn the Sanctuary, regarding matters related to the Chumash community. NOAA has also replaced the detailed activity and program ideas within MH.6 with a new activity that outlines a plan to work with the Chumash community (via the Chumash Community Working Group) to identify mutual objectives for supporting public education about Chumash heritage.

43. Comment: NOAA should explore a government to government relationship with the Chumash.

Response: As the Santa Ynez Band of Chumash Indians is a federally recognized tribe, any interaction between the Santa Ynez Band and NOAA occurs in the context of a relationship between two government entities, and within the limits of the Santa Ynez Band's and the Sanctuary's respective jurisdictions and authorities.

CHUMASH – LANGUAGE REVISIONS

44. Comment: Portions of the Draft Management Plan should be rewritten, especially under the Maritime Heritage Resources Action Plan, because the text contains many examples of "word and meaning biases and conflicts." NOAA should work collaboratively with the Chumash before developing the final versions of the documents.

Response: Although the Sanctuary Advisory Council's Chumash Community Working Group was not available for meetings during the time the final text was being prepared, CINMS staff consulted with a Chumash community member and expert and have worked to fully respond to the Chumash community comments received. NOAA looks forward to continuing to partner with the Chumash community on implementation of activities described within the FMP.

45. Comment: The Draft Management Plan contains several examples of culturally biased language creating the perception of diminished Native Chumash history, presence, participation and responsibility, and some of the language conveys a patriarchal nature of the relationship between the NOAA and the wider Chumash community. It brings an otherwise unaware reader to the conclusion that the Sanctuary is in the role of a necessary savior of native Chumash traditions and teachings.

Response: Text in the DMP was crafted to indicate that NOAA's role will be one of assisting, supporting, and helping in Chumash efforts aimed at cultural revitalization that also align with the mission of the CINMS. NOAA staff have consulted with a Chumash community member and expert and have worked to fully respond to the Chumash community comments received, including by clarifying CINMS's intended role as a supporter of Chumash initiated efforts in supporting public awareness and understanding of Chumash heritage. NOAA looks forward to continuing to partner with the Chumash community on implementation of activities described within the FMP.

46. Comment: A reference to educating Chumash community members on such topics as respectful gathering skills reflects a sense of arrogance and difference in worldview. No matter who NOAA partners with, it cannot teach me to be respectful.

Response: Text in the DMP (strategy MHR.6, activity 3) indicated that the CINMS role in this activity would be to help the Chumash Maritime Association and Chumash Community Working Group provide education and outreach opportunities for the larger regional community regarding Chumash and environmental issues. The text also indicated that this program would be designed primarily for Chumash people to educate their fellow Chumash and others about Chumash heritage. However, in an effort to ensure broader Chumash community input NOAA has replaced this specific activity in FMP strategy MH.6 with activities that now describe a process for working together to identify mutual education and outreach objectives.

47. Comment: NOAA should revise text that refers to "descendents of" Chumash, since such people identify themselves as Chumash, not descendents.

Response: NOAA has replaced references to "descendants of Chumash" with "Chumash."

48. Comment: The DMP's description (at Part II-C, The Human Setting) of the importance of the Channel Islands and surrounding waters to humans for thousands of years is confusing and unclear.

Response: NOAA has revised this text within the FMP's section II-C. See also the response to comment 44 for information on NOAA's efforts to develop Chumash related text.

49. Comment: NOAA should add information about the forced relocation of Island Chumash people.

Response: NOAA has added information to the FMP Human Setting section, the Maritime Heritage Resources Action Plan's Description of the Issues section, and the FEIS Affected Environment/Maritime Heritage Resources section about forced relocation of island Chumash to the mainland. See also the response to comment 44 for information on NOAA's efforts to develop Chumash related text.

50. Comment: The MHR Action Plan refers to "Native American Artifacts," but the artifacts are specific to the Chumash people.

Response: NOAA has changed the text referring specifically to Native American artifacts found in the Channel Islands to refer to such artifacts as Chumash Native American artifacts.

51. Comment: Text about Juan Rodriguez Cabrillo's voyage of discovery (1542-1543) improperly suggests that Cabrillo "discovered" the already inhabited Channel Islands.

Response: Although the text did not state that Cabrillo discovered the Channel Islands, NOAA recognizes that the reference to Cabrillo's "voyage of discovery" could be construed to mean this, and as such NOAA has revised the text accordingly.

52. Comment: NOAA should revise text that refers to Chumash people in the past tense, because there has been no discontinuation of the Chumash people. NOAA should also revise Strategy MHR.6 title, "Promoting Public Education of Chumash Native American History," by removing the word "history."

Response: NOAA made a directed effort to refer to contemporary Chumash in the DMP and DEIS, and to ensure that there are no improper references to Chumash people in the past tense within the FMP and FEIS. See also the response to comment 44 for information on NOAA's efforts to develop Chumash related text. Regarding the title of Strategy MH.6, NOAA has changed the strategy title and text, which now describe the Sanctuary's efforts to support public education of Chumash Native American maritime heritage.

CIVIL PENALTIES

53. Comment: The NMSP is positioning itself for growth in any way that it can, including by gaining the ability to assess new civil penalties. Current law prohibiting certain activities does not provide the potential of financial benefit for the CINMS.

Response: NOAA has maintained the authority to assess civil penalties for violations of CINMS regulations since those regulations took effect in the early 1980s. Congress defines the parameters of civil penalties during the authorization and subsequent reauthorization of the NMSA. The actual penalties levied for violations vary in proportion to the severity of the incident and other case-specific factors. NOAA is promulgating new and revised CINMS regulations to provide NOAA enforcement officers and enforcement partners with enhanced regulatory tools designed to improve protection of Sanctuary resources.

DESIGNATION TERMS

54. Comment: NOAA should not make the proposed changes to the Sanctuary's designation document, because they are unnecessary and NOAA has not followed the procedures required for granting CINMS new regulatory authority.

Response: In accordance with section 304(a)(4) of the NMSA (16 U.S.C. 1434(a)(4)), the terms of designation of a sanctuary include: 1) the geographic area proposed to be included within the sanctuary; 2) the characteristics of the area that give it conservation, recreational, ecological, historical, research, educational, or esthetic value; and 3) the types of activities that will be subject to regulation by the Secretary to protect those characteristics. Under the National Marine Sanctuaries Act, a sanctuary's terms of designation may only be modified by following the same procedures by which the sanctuary was designated. NOAA has followed this process to modify the CINMS terms of designation, including the publication of a draft environmental impact statement, proposed regulations, and draft terms of designation. NOAA also explained why the proposed changes are necessary and analyzed each change thoroughly in the EIS.

55. Comment: NOAA's ability to protect Sanctuary resources is overly limited by the CINMS Designation Document. Identifying and proposing regulations to protect Sanctuary resources, including

by extending the CINMS scope of authority is required to fulfill the duty Congress assigned to the National Marine Sanctuary Program.

Response: National marine sanctuary terms of designation typically express the types of activities subject to sanctuary regulation in general terms. Recognizing that environmental conditions in a sanctuary change over time, this is necessary to allow NOAA to make appropriate modifications to existing regulations or to regulate additional activities that are impacting or may impact sanctuary resources (*i.e.,* to allow for adaptive management). NOAA is revising the CINMS terms of designation as necessary to provide the authority to implement its revised proposed regulations.

DISCHARGE

DISCHARGE – BILGE WATER

56. Comment: NOAA should include an explicit ban on dumping oily bilge water (treated or not).

Response: Although NOAA provides certain exceptions to the CINMS discharge regulation, the discharge of oily bilge water is prohibited by existing regulations and would also be prohibited under the new regulations. See the FEIS for additional information on and revisions to the discharge regulation.

DISCHARGE – CHUMMING

57. Comment: NOAA should clarify that the discharge regulation allows for the common practice of filleting fish during the trip back to port.

Response: NOAA considers tossing scraps overboard from filleting fish caught in the Sanctuary during the trip back to port to be part of the exception for fish, fish parts, or chumming materials (bait).

58. Comment: Several commenters expressed support for the proposed exception for fish, fish parts, or chumming materials (bait) to the CINMS discharge regulation.

Response: Comment noted.

59. Comment: Commenter is concerned about compliance with the discharge regulation (*e.g.*, feeding wildlife food scraps).

Response: In an effort to increase compliance with CINMS regulations, NOAA will use an educational approach to raise awareness of the regulation and the problems associated with feeding wildlife. An educational approach to the issue can also be implemented through the Public Awareness and Understanding Action Plan strategy AU.3 (Team OCEAN) activities, including those pertaining to ocean etiquette. See also the response to comment 120 for an explanation of how Sanctuary regulations are enforced.

60. Comment: The exception to the enter-and-injure regulation as it relates to discharge of fish and fish parts and chumming materials is unnecessary, and could potentially undermine the effect, perception, and credibility of this otherwise sound and necessary measure.

Response: NOAA is not considering removing the exception to the CINMS discharge regulation for fish, fish parts, or chumming material (bait) used in or resulting from lawful fishing activity beyond the boundary of the Sanctuary. NOAA believes that such activities do not currently pose a threat to

Sanctuary resources; if in the future such activities were to harm Sanctuary resources, then NOAA would re-evaluate the scope of this exception.

DISCHARGE – ENTER/INJURE

61. Comment: A number of commenters expressed support for the proposed prohibition on discharging or depositing from beyond the boundary of the Sanctuary any material or other matter that subsequently enters the Sanctuary and injures a Sanctuary resource or quality.

Response: Comments noted.

62. Comment: The proposed prohibition on discharging or depositing from beyond the boundary of the Sanctuary is problematic because it enables the Sanctuary to regulate activities outside its jurisdiction; is an unwarranted and improper extension of the Sanctuary boundaries;" the term 'injury' is not defined, thus inviting numerous interpretations and the potential for litigation; and the process by which injury would be determined is not described.

Response: In order for a violation to occur of the regulation prohibiting discharge or deposit from beyond the Sanctuary, the matter that is discharged or deposited from beyond the Sanctuary must also injure a Sanctuary resource or quality, except for the exceptions listed in the regulations. Thus, operations and activities taking place beyond the Sanctuary are only subject to this regulation if the discharge or deposit of the matter is shown to injure a Sanctuary resource or quality within the Sanctuary, and this regulation is not an extension of the Sanctuary's boundary.

Injure, as defined at 15 CFR 922.3, means to change adversely, either in the short or long term, a chemical, biological or physical attribute of, or the viability of. This includes, but is not limited to, to cause the loss of or destroy.

DISCHARGE – GENERAL

63. Comment: NOAA should apply heightened restrictions on polluting vessels, including large vessels, watercraft and cruise ships, in the Santa Barbara Channel, or tighten the exceptions to the discharge and deposit prohibition with the goal of better protecting Sanctuary waters from pollution.

Response: NOAA's revised sanctuary regulations would strengthen protections against pollution from vessels by clarifying that discharges allowed from marine sanitation devices apply only to Type I and Type II marine sanitation devices, and by limiting graywater and treated sewage exceptions to apply only to vessels less than 300 gross registered tons (GRT), and oceangoing ships (not including cruise ships) without sufficient holding tank capacity to hold graywater or sewage while within the CINMS.

64. Comment: To best protect Sanctuary resources, the new CINMS regulations should ban dumping hazardous waste into the Sanctuary.

Response: CINMS regulations prohibit discharging or depositing from within or into the Sanctuary any material or other matter, with a list of exceptions. Discharging or depositing any material or other matter that is not included in the list of exceptions, including hazardous waste, is prohibited.

DISCHARGE – MEALS

65. Comment: Several commenters expressed support for NOAA's proposal to prohibit discharging or depositing from within or into the Sanctuary meals on board vessels.

Response: Comments noted.

DISCHARGE – SEWAGE/GRAYWATER

66. Comment: The discharge and deposit regulation requires that vessel operators must lock all marine sanitation devices in a manner that prevents discharge of untreated sewage, without defining what is meant by "lock."

Response: Locking means securing the device such that removal of a locking mechanism (*e.g.*, padlock, combination lock, or cable tie) is required to enable the system to discharge raw sewage overboard. In the case of a Y valve that toggles toilet bowl discharge between a treatment system/holding tank and an overboard outlet, the valve handle would need to be in the closed position for overboard discharge and locked to prevent inadvertent and unopposed opening of the valve.

67. Comment: A number of commenters indicated that the proposed discharge and deposit regulation does not provide the same level of protection as California Clean Coast Act.

Response: NOAA revised the proposed CINMS discharge/deposit regulation to prohibit the discharge of sewage from all vessels 300 GRT or more, and the discharge of graywater from vessels 300 GRT or more, except for oceangoing ships without sufficient holding tank capacity for graywater. This is consistent with the Clean Coast Act. These regulatory changes were analyzed in a Supplemental EIS (March 2008).

68. Comment: A number of commenters, including the U.S. EPA and the California State Water Resources Control Board, expressed support for the revised proposed discharge regulation as analyzed in the SDEIS.

Response: Comment noted.

69. Comment: One commenter supported CINMS for not providing a sewage discharge exemption for ships greater than 300 GRT, as has been proposed by the Northern California sanctuaries, but objected to the revised proposed discharge regulation exceptions for graywater and treated sewage from vessels less than 300 GRT, and graywater from oceangoing ships without sufficient holding tank capacity to hold graywater within the Sanctuary.

Response: NOAA acknowledges support for the revised proposed discharge/deposit regulation as analyzed in the SDEIS; however, NOAA has concluded that an exception for treated sewage discharge/deposit from oceangoing ships without sufficient holding tank capacity (excluding cruise ships) is warranted at this time. See the response to comment 72 for more information. CINMS is maintaining the treated sewage exception for vessels less than 300 GRT. The rationale for the treated sewage exceptions is provided in the response to comment 70. The exception for oceangoing ships without sufficient holding tank capacity to hold graywater while within the Sanctuary is proposed because, unlike cruise ships and newer oceangoing ships, some older oceangoing ships are designed without the ability to retain graywater, and, as such, must discharge graywater directly as it is produced. As explained in FEIS section 4, graywater discharge from small vessels, and from oceangoing ships without sufficient holding tank capacity to hold graywater while within the Sanctuary, is anticipated to have a less than significant adverse impact on the Sanctuary's physical, biological, and esthetic resources.

70. Comment: NOAA should phase-in a total wastewater discharge ban for all ocean-going vessels in CINMS.

Response: NOAA is not planning to phase in a total wastewater discharge ban for all oceangoing vessels in the Sanctuary at this time because available data do not suggest that the excepted sewage and graywater discharges within the Sanctuary pose an unacceptable risk to Sanctuary resources and qualities. Should information to the contrary become available, NOAA may consider further regulation.

71. Comment: Regulations applying to large vessels should also apply to vessels servicing those larger vessels (*e.g.,* barges that may be used to transfer sewage from an anchored vessel to outside of the 3-mile limit).

Response: The regulations would prohibit discharging from within or into the Sanctuary sewage (treated and untreated) and graywater from vessels 300 GRT or more (unless the vessel is an oceangoing ship without sufficient holding tank capacity – this does not apply to cruise ships). NOAA interprets this regulation to prohibit the discharge of such sewage or graywater even if the sewage or graywater were transferred to a second vessel, regardless of the second vessel's size. Furthermore, transferring sewage from an anchored large vessel seems implausible since vessels 300 GRT or more are not known to anchor within the Sanctuary.

72. Comment: The proposed revisions of the Sanctuary's discharge prohibition should be consistent with the California Clean Coast Act and include the exception for ocean going vessels without sufficient holding tank capacity to hold treated blackwater (sewage) while within the Sanctuary.

Response: To be consistent with the California Clean Coast Act, as well as with regulations proposed by the Monterey Bay, Cordell Bank, and Gulf of the Farallones national marine sanctuaries, NOAA is providing an exception for treated sewage discharges from oceangoing ships that do not have sufficient holding tank capacity while within the CINMS.

73. Comment: Adequate education on the proposed discharge restrictions will ensure that oceangoing ships retain all discharges to the greatest extent possible within the Sanctuary.

Response: Outreach and education to the shipping industry about the Sanctuary's revised regulations is important, and NOAA will apply educational resources toward that purpose, including outreach to the Pacific Merchant Shipping Association.

74. Comment: The management plan fails to recognize or provide an incentive for the use and further development of advanced wastewater treatment systems currently installed on cruise ships, and instead, encourages ships to construct and utilize large holding tanks and discharge elsewhere. The targeting of cruise ships and ban on discharges promotes older, cheaper, less advanced technology and the use of holding tanks. The proposed discharge regulations amount to a wholesale ban on discharges creating a disincentive to further research, development and installation of systems that produce clean and scientifically acceptable effluent. If discharges are harmful, transferring them to another location would simply be transferring the problem.

Response: The management plan recognizes the use of advanced wastewater treatment systems by cruise ships. The SDEIS and FEIS both acknowledge the use of these systems and their ability to dramatically improve the quality of effluent discharged in Alaska. Currently, however, advanced wastewater treatment systems on cruise ships do not always function properly and even when they do, they do not always effectively remove all contaminants. NOAA encourages the development of new technologies to address these issues.

Similarly, the management plan does not encourage or promote retrenchment to older, cheaper, less advanced technology. The regulations would prohibit cruise ships from discharging sewage and

graywater from within or into a particular area afforded special protection due to its nationally significant resources. NOAA believes that transferring discharges outside of the Sanctuary is an appropriate resource protection measure.

75. Comment: There is no credible reason to ban cruise ship discharges from Type II MSDs and advanced wastewater treatment systems, and such discharges should be allowed in general, or when discharged while the vessel is moving at or above six knots. Cruise ship Type II MSDs meet or exceed U.S. Coast Guard standards and pose little or no threat to the environment. The revised proposed discharge regulation assumes that any sewage and gray water discharges, no matter the quality, are likely to have adverse environmental impacts on the receiving water and ambient air based on their sheer volume. NOAA should consult with the EPA and Alaska Department of Environmental Conservation since they have done an exceptional amount of work regarding cruise ship effluent discharges.

Response: NOAA is not aware of any EPA or other reports showing that treated sewage discharges from cruise ships would not pose any discernable effect within the Sanctuary. As discussed in the SDEIS (p. 22), it is important to note that many dilution studies only consider effluent from properly functioning MSDs, which is not necessarily the condition of MSDs on all or most vessels. The revised regulation addresses NOAA's concerns about failure of conventional MSDs on large vessels to adequately treat sewage waste streams, and lack of monitoring of those waste streams.

Regarding use of Coast Guard approved Type II MSDs, Coast Guard standards for MSDs pertain to the design and construction of MSDs, and procedures for certifying MSDs prior to sale, introduction or delivery into interstate commerce, or import into the United States for sale or resale. The Coast Guard does not test the effluent from certified MSDs once installed onboard a vessel (except in Alaska). Simply having a Coast Guard approved MSD on board a ship does not guarantee that a ship's sewage discharges meet EPA discharge requirements, as demonstrated by cruise ship sampling data in Alaska prior to institution of more stringent discharge standards, monitoring, inspection, and reporting requirements there.

The SDEIS and FEIS analysis of the potential impacts of cruise ship discharges is based on both the quality and volume of sewage and graywater discharges. Even when sewage and graywater discharges meet MSD Type II standards for fecal coliform and total suspended solids, there are other qualities of sewage and graywater discharges that may be harmful, such as chemicals used to treat sewage and graywater, and high nutrient levels, especially when discharged in large volumes. As noted in the SDEIS and FEIS, results of cruise ship graywater sampling in Alaska indicate that in the absence of water quality standards and monitoring, graywater is similar to sewage in terms of fecal coliform and total suspended solids. The SDEIS and FEIS do not analyze cruise ship sewage and graywater discharge impacts on ambient air.

Regarding cruise ships that transit Alaska, and that use advanced wastewater treatment systems, see the response to comment 76.

76. Comment: Rather than a ban, NOAA should consider drafting regulations that mirror requirements in other jurisdictions, such as Alaska, which permit sewage and gray water discharges at levels scientifically acceptable through discharge criteria.

Response: As stated in the SDEIS and FEIS, the results of cruise ship blackwater samples taken in Alaska indicate that blackwater from vessels without advanced treatment systems (and not subject to mandatory monitoring, inspection, and reporting) may contain levels of fecal coliform and total suspended solids that exceed federal standards for MSDs, as well as a variety of other pollutants. Unlike Alaska, NOAA is not planning on instituting a CINMS cruise ship sewage and graywater discharge

monitoring, inspection, and reporting program. Effluent monitoring would be cost prohibitive and infeasible, particularly for vessels underway (large vessels do not customarily stop in the Sanctuary). Additionally, ship discharge audits often reveal that a discharge occurred but do not contain information on contaminant levels. Currently, advanced waste water treatment systems on cruise ships do not always function properly and even when they do, they do not always effectively remove all contaminants. Therefore NOAA believes that prohibiting cruise ship sewage and graywater discharges is the most effective and enforceable regulation.

The SDEIS and FEIS both acknowledge the use of advanced wastewater treatment systems and their ability to improve the quality of effluent discharged in Alaska. However, the program adopted in Alaska is a complex arrangement requiring issuance of a permit, prior demonstration that the ships can meet water quality standards based on independent contractor evaluation, environmental compliance fees, wastewater sampling and testing protocols, record keeping and reporting protocols, on-board observers, and a tax per passenger to fund the administration of the program. Such a program is inherently difficult to monitor and enforce and the NMSP has no mechanism in place for recouping the necessary funds needed to administer it. Also, the EPA studies indicate that although advanced wastewater treatment systems remove most of the priority pollutants of concern they do not adequately reduce discharge of ammonia and metals. For these reasons, the CINMS regulations would prohibit discharges from advanced wastewater treatment systems. Cruise ships have sufficient holding tank capacity to hold their discharges as they transit the Sanctuary.

77. Comment: CINMS should not implement new sewage discharge regulations for small vessels because 1) existing laws prohibit the discharge of untreated sewage from small vessels within three nautical miles of shore; 2) existing requirements should be better enforced instead of adding new requirements; 3) no significant water quality issues have been noted for discharges by vessels under 150 GRT with certified MSDs Type I, II, or III; 4) requiring untreated sewage to be discharged further offshore would turn "good guys" into "bad guys"; 5) using the Coast Guard regulations as the standard for sewage discharges from vessels less than 300 GRT would facilitate Channel Islands National Park operations (*i.e.*, kelp forest monitoring, submerged cultural resources monitoring)"; 6) Coast Guard regulations are easier to enforce since most boaters are familiar with them; 7) prohibiting untreated sewage discharge within the entire Sanctuary would present a trade-off between having untreated sewage discharged further from shore and environmental impacts such as pollution costs (including from fuel production and transportation) and energy waste from the fuel burned to get there; and 8) a requirement to discharge untreated sewage further offshore presents time and fuel costs to boaters.

Response: NOAA recognizes that other federal regulations prohibit the discharge of untreated sewage within three nmi from shore; however, CINMS regulations have prohibited the discharge of untreated sewage within the entire Sanctuary since 1981 (the FEIS clarifies this existing regulation). NOAA is concerned about the pathogens, nutrients, and esthetic impacts that untreated sewage could introduce if discharged within the Sanctuary. To date, untreated sewage discharges have not been definitively linked to significant water quality problems in the Sanctuary; however, the final regulations will ensure that such problems do not occur in the future.

CINMS partners closely with Channel Islands National Park (CINP) on marine operations including research, monitoring, and enforcement. Based on NOAA's analysis of Park and CINMS vessel operations, NOAA does not expect the clarifications to the sewage discharge regulation to significantly impede Park operations.

Enforcement of regulations, including discharge regulations, is important to ensure their effectiveness. NOAA intends to consider enforcement needs during the development of the Sanctuary's water quality protection program (see FMP strategy WQ.2). Additional outreach and education regarding Sanctuary

discharge regulations is warranted, and NOAA intends to work with the Coast Guard, CINP, and other key agencies to develop effective outreach tools.

NOAA believes all boaters can reasonably adapt to comply with this regulation and practice clean boating within the Sanctuary, as was the case when similar or more stringent regulations were adopted in other large areas of U.S. waters (*e.g.*, the Great Lakes, state marine waters in the Florida Keys, and Chesapeake Bay). With proper trip planning, necessary equipment and maintenance, and attention to sewage holding capacity and needs, NOAA expects that boaters can take steps to avoid special trips beyond the Sanctuary's six nmi boundary solely to discharge sewage (after which they would continue boating within the Sanctuary). For example, there are compact commode and portable sewage storage systems widely available on the market.

78. Comment: NOAA should prohibit sewage sludge from large vessels because it is produced in large quantities by cruise ships and included in the California Clean Coast Act's prohibitions.

Response: Sewage sludge discharges/deposits are prohibited throughout the Sanctuary.

79. Comment: CINMS should revise the discharge regulation to mirror existing law pertaining to vessel sewage and graywater discharges and fully prohibit graywater, sewage (untreated and treated) and sewage sludge discharges from cruise ships and other large oceangoing vessels throughout the Sanctuary.

Response: Regarding mirroring existing laws on vessel sewage and graywater discharges, see the response to comment 67. The revised discharge and deposit regulation now prohibits graywater discharges from vessels 300 GRT or more (except oceangoing ships without sufficient holding tank capacity to hold graywater while within the Sanctuary); it also prohibits treated sewage discharges from all vessels 300 GRT or more throughout the Sanctuary (except oceangoing ships without sufficient holding tank capacity to hold sewage while within the Sanctuary), and prohibits untreated sewage from all vessels within the Sanctuary. The Sanctuary's discharge regulation does not provide an exception for sewage sludge discharges.

80. Comment: The Sanctuary should not exempt military vessels from the discharge and deposit prohibition, as they are included in the California Clean Coast Act's sewage and sewage sludge prohibitions.

Response: Although military discharges would be exempted from the Sanctuary's discharge and deposit prohibition, NOAA believes the military discharge requirements under CWA section 312(n) are sufficient to protect Sanctuary resources.

81. Comment: NOAA should delete the discharge regulation's graywater exception.

Response: NOAA believes there is no need to prohibit graywater discharges from vessels less than 300 GRT within the Sanctuary at this time. However, Sanctuary regulations would now prohibit graywater discharges from vessels 300 GRT or more, except from oceangoing ships without sufficient holding tank capacity to hold graywater while within the Sanctuary.

82. Comment: NOAA's discharge regulation should reflect the California Coastal Commission's recommendation to prohibit vessels of 300 GRT or more from discharging sewage or graywater into the waters of the Sanctuary.

Response: NOAA has revised the CINMS discharge regulation to reflect the California Coastal Commission's recommendation and prohibit the discharge of sewage from all vessels 300 GRT or more,

as well as the discharge of graywater from vessels 300 GRT or more. Exceptions would be consistent with the California Clean Coast Act, allowing graywater and treated sewage from oceangoing ships without sufficient holding tank capacity to hold these discharges while within the Sanctuary).

83. Comment: Due to the volume of their discharges, cruise ships should be directed around the Sanctuary.

Response: Rather than direct cruise ships around the Sanctuary, NOAA is excluding cruise ships from the CINMS sewage and graywater exceptions, thereby prohibiting their discharge within the Sanctuary.

84. Comment: Unless NOAA is able to institute a rigorous monitoring and sampling program for sewage effluent from ships as Alaska has done, it is prudent to adopt a no-discharge policy that mirrors the state of California's laws.

Response: Although NOAA may implement some discharge monitoring in partnership with other agencies, NOAA is not currently planning to institute a comprehensive sewage effluent monitoring and sampling program in the Sanctuary similar to Alaska's program (see also the response to comment 75. Regarding adopting a policy that mirrors California's law, see the response to comment 67.

85. Comment: All vessels, ships, or large vessels should hold either all waste or sewage until they can discharge it into pump out stations for disposal or treatment on land.

Response: The revised CINMS discharge regulation would prohibit discharging untreated sewage within the Sanctuary from vessels less than 300 GRT, and prohibit discharging sewage (whether treated or untreated) within the Sanctuary from vessels 300 GRT or more, except for oceangoing ships that do not have sufficient holding tank capacity to hold sewage while within the Sanctuary.

86. Comment: NOAA should either include sewage sludge in the definition of "sewage" or explicitly prohibit sewage sludge in the discharge regulation.

Response: Existing CINMS regulations do not provide an exception for sewage sludge discharge/deposit; as such, these discharges/deposits are prohibited.

87. Comment: The prohibition of sewage sludge should be incorporated in outreach documents.

Response: CINMS staff will consider this comment when developing outreach products about the revised Sanctuary regulations.

88. Comment: Commenter supports the marine sanitation device clarification in the revised proposed discharge regulation.

Response: Comment noted.

89. Comment: Commenter supports the proposed definitions of "graywater," "oceangoing ship," and "cruise ship," as well as the Sanctuary's effort to provide greater regulatory consistency and clarity by establishing formal definitions for important concepts relevant to CINMS resource conservation and management.

Response: Comment noted.

ECOSYSTEM BASED MANAGEMENT

90. Comment: The Management Plan refers to Ecosystem Based Management, but there is no mention of Ecosystem Based Management in the NMSA.

Response: The Management Plan Introduction section refers to ecosystem-based management and the NMSA, and it specifies the sections of the NMSA that NOAA believes support the use of ecosystem-based management. As stated therein, NOAA believes that ecosystem-based management is in keeping with the NMSA's primary objective of resource protection. Section 301(b) of the NMSA, which provides the purposes and policies of the national marine sanctuary system, provides CINMS and the other national marine sanctuaries with a solid framework for ecosystem-based management. Section 301 provides that it is the purpose of the NMSA to, among other things: a) maintain the natural biological communities of the national marine sanctuaries, and to protect, and where appropriate, restore and enhance natural habitats, populations, and ecological processes; b) 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 the sanctuaries; and c) to create models of, and incentives for, ways to conserve and manage these areas, including the application of innovative management techniques. Maintaining biological communities, and protecting, restoring, and enhancing habitats, populations, and ecological processes (see clause a above), along with addressing the health and resiliency of national marine sanctuaries (see clause b above), are endeavors best suited to an ecosystem-based approach. Such an approach is consistent with applying innovative management techniques (see clause c above).

91. Comment: NOAA should replace the management plan's Grumbine (1994) definition of Ecosystem Based Management with the definition from the Scientific Consensus Statement on Marine Ecosystem Based Management released in March 2005 (by authors including Jenn Casselle, Jennie Dugan, Ben Halpern, Jeremy Jackson, Satie Airame, and Hunter Lenihan).

Response: Text in the FMP has been revised to reflect the definition of marine ecosystem-based management from NOAA's New Priorities for the 21st Century (NOAA's strategic plan for 2006-2011), rather than the definition provided by Grumbine (1994). NOAA's definition of an ecosystem approach to management is consistent with the 2005 Scientific Consensus Statement on Marine Ecosystem-Based Management, which is available on line at http://www.compassonline.org/marinescience/solutions_ecosystem.asp.

EDUCATION AND OUTREACH

92. Comment: Commenters indicated support for the management plan's education and outreach goals and objectives and the Public Awareness and Understanding Action Plan.

Response: Comment noted.

93. Comment: Through the Public Awareness and Understanding Action Plan NOAA should ensure that all employees and crew of Channel Islands National Park concessionaires who bring visitors to the Sanctuary are aware of and understand CINMS regulations and resource conservation issues. Anecdotal evidence suggests that even major concessionaires are not aware of CINMS regulations on matters such as vessel sewage and wastewater discharge. NOAA should also provide an incentive for concessionaires to participate in an education program.

Response: CINMS staff work directly with Channel Islands National Park staff responsible for educating concessionaires through the strategic plan mentioned in the FMP Public Awareness & Understanding Action Plan (Strategy AU.2 activity 3). As part of the Ocean Etiquette Outreach program (AU.3, activity 4), which promotes communication and coordination between California ocean users and Federal and state agencies, CINMS staff plan to engage concessionaires and other boaters in Ocean Etiquette workshops. As the Park reviews and awards concessionaire licenses to various operators, CINMS staff will continue to communicate with the Park on interests and concerns regarding concessionaire compliance with Sanctuary regulations, such as those pertaining to clean boating practices, as well as possible compliance incentives.

94. Comment: NOAA should work with the City of Santa Barbara to increase opportunities for effective signage and publicity.

Response: NOAA worked with the City of Santa Barbara (City) in the mid-1990s on several CINMS interpretive signs that are located in Santa Barbara's Shoreline Park. NOAA also works with the City each year by participating in the annual Harbor and Seafood Festival, and serving alongside the City, U.S. Forest Service, National Park Service and Santa Barbara Maritime Museum as a partner in the Outdoors Santa Barbara Visitor Center in the Santa Barbara Harbor (see the Public Awareness and Understanding Action Plan strategy AU.7 – Visitor Center Support & Development for more information).

NOAA is currently working with the City Waterfront Department to place signs at the Santa Barbara Harbor fuel dock and along the Santa Barbara Harbor Fish Walk. These signs focus on CINMS, CINP, and marine zoning, and are part of a larger NMSP sponsored initiative called the California Signage Plan. Sanctuary interactive kiosks, like signs, are also an important outreach tool that can help provide CINMS publicity at various locations, such as at the City Waterfront Department office. For information about interactive kiosks, see Public Awareness and Understanding strategy AU.7.

95. Comment: The management plan did not indicate how NOAA would assess the effectiveness of strategies AU.1 through AU.8.

Response: NOAA understands the importance of evaluating the effectiveness of its programs. FMP Strategy EV.1 (Measuring Sanctuary Performance Over Time) details how each education program or product will be evaluated, and FMP Table 16 shows specific strategies, objectives, performance measures and metrics for measuring effectiveness of the Public Awareness and Understanding Action Plan. Also, NOAA is working at CINMS to meet the NMSP's system-wide performance measure related to education, which states that *"By 2010 all education programs implemented in national marine sanctuaries will be assessed for effectiveness against stated program goals and objectives and appropriate National and State education standards."*

96. Comment: NOAA should clarify for each program whether there are plans to assure that strategies AU.1, and AU.3-AU.9 are reaching a diverse audience.

Response: NOAA strives to reach diverse audiences with its CINMS education and outreach programs and materials. FMP Strategy AU.9 describes how CINMS will build multicultural elements into existing education programs and materials, and activity 5 describes in detail the implementation of a comprehensive multicultural education strategic plan for Santa Barbara and Ventura Counties.

97. Comment: NOAA should consider best education practices in the development of Strategy AU.1.

Response: NOAA education staff at CINMS use best practices when developing educational programming. CINMS educators 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.

98. Comment: Given the changing make-up of our population, NOAA should create strategies to create a diverse pool of interns and volunteers, and should create career paths for interns from ethnic groups under-represented in resource sciences. The latter would help create a pool of qualified future resource scientists, technicians, managers and leaders.

Response: As mentioned in Strategy AU.9 of the FMP's Public Awareness & Understanding Action Plan, CINMS implements the MERITO Hispanic Students Internship Program. Text in FMP Strategy AU.2 has been changed to reflect these CINMS internship strategies for under-represented youth as defined in Strategy AU.9.

99. Comment: The management plan refers to the Los Marineros education program, without explaining that this program is now defunct.

Response: NOAA and the Santa Barbara Museum of Natural History (Museum) started the Los Marineros Program in 1987. The Museum took over administration of the program in the mid 1990's. The Museum decided not to continue the program after 2005, which is now reflected in the FMP. NOAA is now working to build Sanctuary stewardship and increase understanding of ocean related threats within the Hispanic community of Santa Barbara and Ventura counties through strategy AU.9, Multicultural Education. A component of this strategy is the MERITO Academy which targets 5^{th}-8^{th} grade teachers and students and provides a meaningful watershed experience through field trips to the beach and Sanctuary.

100. Comment: NOAA should mention a shift to a philosophy of sustainability in its CINMS education programs.

Response: Since its designation in 1980, CINMS staff has been educating the community about human impacts on the ocean environment and working to foster a sense of personal ownership and responsibility for care of sanctuary resources.

101. Comment: NOAA should incorporate into education and outreach action plans some specific programs directly facilitating compatible use, such as brochures with simple charts indicating best places to scuba dive, fish, kayak, view wildlife, and so forth.

Response: NOAA's "Protecting Your Channel Islands" brochure shows popular anchorages, diving spots and wildlife areas (for pinnipeds and seabirds), and provides tips for watching wildlife and a synopsis of sanctuary and park regulations. Members of the boating and fishing communities participated in the development of this brochure through the Sanctuary Advisory Council and the Sanctuary Education Team. NOAA will continue to work with boaters, fishers, and other interested community members to develop useful brochures and other education materials regarding responsible ways to enjoy sanctuary resources.

102. Comment: NOAA should support or sponsor contests or festivals that celebrate use of the Sanctuary, such as photo contests, harbor seafood festivals, sailing regattas, and whale festivals.

Response: As indicated in FMP Public Awareness & Understanding Action Plan Strategy AU.6, CINMS staff participation in outreach events is identified as a tool to provide Sanctuary information to a widely diverse audience. CINMS staff and volunteers participate in over 30 regional outreach events annually, spanning from Santa Barbara County to Los Angeles County, serving a diverse number of constituents.

Events include whale festivals, harbor festivals, boat shows, fishing conventions, and dive industry events.

103. Comment: NOAA education staff at CINMS should establish closer contact with researchers whose work forms the information base used by Sanctuary education programs.

Response: NOAA education and research program staff at CINMS work closely together on many different Sanctuary management issues. One example is the ongoing "From Shore to Sea" lecture series sponsored by CINMS and CINP, which brings scientists studying the Channel Islands to venues in Santa Barbara and Ventura one night per month for a public presentation about their research. CINMS research and education staff also collaborate on other programs and products including interpreting research data for presentation on the CINMS web site, annual research summaries, and the CINMS Teacher at Sea program.

104. Comment: The management plan should mention the 'Follow That Fish!' curriculum and aquarium exhibit, which is a program that highlights the results of fish movement studies in the Sanctuary conducted by the Pfleger Institute of Environmental Research (PIER) using an acoustic received array.

Response: In 2006, PIER removed its acoustic receivers and discontinued its fish movement study project. Consequently, NOAA is not highlighting this project in the FMP's description of educational activities.

EMERGENCY RESPONSE

105. Comment: NOAA should develop a means for more timely response to oil spills within the Sanctuary by: 1) identifying vessels (*e.g.*, local or Sanctuary vessels) capable of boom deployment and skimming systems, 2) investigating the feasibility of the sanctuary becoming a Clean Seas client, and 3) providing spill cleanup/response equipment cached at various locations in the Channel Islands.

Response: NOAA staff take an active role in spill response preparation by representing CINMS on the Area Contingency Plan (ACP) committee for US Coast Guard Region IX. CINMS staff are also instrumental in helping to revise the ACP to create more effective response to spills, specifically in the area of resource protection. The ACP is a "cookbook" for oil spill response that includes contact information for responders, agencies, cleanup contractors, and vessel and equipment resources. This information is constantly updated. Clean Seas LLC has response vessels in place that can quickly respond to spills within the sanctuary. Another regional organization with vessels and trained crew capable of responding to spills is the Ventura County Commercial Fishermen's Association's Fishermen's Oil Response Team, or FORT. Equipment caches kept on the islands would need to be authorized by the National Park Service. Obtaining and placing any spill equipment would be best done through an agency / responder partnership with those organizations, such as the USCG and Clean Seas LLC, that have dedicated staff with expertise in spill response and all associated equipment and assets. For more information about how CINMS is involved in and addresses emergencies such as oil spills, see FMP Strategy EE.1.

106. Comment: NOAA should look into whether oil facilities can store cleanup equipment, inventory equipment already there, and consider whether it can develop an agreement between oil companies and sanctuaries to use that equipment.

Response: Currently oil platforms in the Santa Barbara Channel store various quantities of booming and skimming equipment and dispersants. Full inventory lists are kept and supplied to various Federal, State, and local agencies involved in oil spill response, and these lists are accessible by CINMS staff as needed.

Equipment use requires specialized training, and oil companies work with spill response co-ops such as Clean Seas LLC, to provide equipment and personnel for cleanup. Additionally, agencies such as the U.S. Coast Guard can "federalize" (place a spill under the jurisdiction of the Federal government if the responsible party is not responding appropriately) an oil spill and then call in authorized, trained contractors to help respond to the spill.

107. Comment: NOAA should look towards the future of emergency response and find funding for Clean Seas. Currently oil spill response is paid for by oil companies, so if oil and gas facilities are decommissioned then Clean Seas is not likely to be here.

Response: Although CINMS staff could contribute to planning ideas for maintaining oil spill response capabilities provided by Clean Seas, such an effort would most likely be spearheaded by other NOAA offices (such as NOAA HAZMAT) as well as Federal, State, and local agencies whose primary mission is oil spill response.

EMERGING ISSUES

108. Comment: Commenter expressed support for the management plan review addressing emerging issues.

Response: Comment noted.

109. Comment: The management plan should provide a stronger link between the Emerging Issues and Conservation Science action plans by directing research towards evaluating emerging issues.

Response: Research coordination and integration are very important to the evaluation of emerging issues. Within the Conservation Science Action Plan, NOAA has added details about the link between emerging issues and conservation science within the Conservation Science Action Plan Overview and Strategy CS.3, as well as in Strategy RP.1. As explained in RP.1, input from the Advisory Council, the science community, and the public informs CINMS efforts at identifying and assessing current and emerging issues at all stages, including identification of issues, assessment of threats, and tracking and responding to issues.

110. Comment: The management plan should clarify whether each emerging issue is: a) forecasted to, but not presently harming Sanctuary resources; or b) already causing harm to Sanctuary resources. NOAA should also develop criteria to determine when an issue is emerging vs. when it has emerged.

Response: The FMP includes a Resource Protection Action Plan in which NOAA has clarified and augmented information on the status of each issue previously listed as an "emerging issue." The Resource Protection Action Plan also articulates how CINMS addresses current issues and how it will address emerging issues. Since NOAA has outlined how it plans to identify, assess, prioritize, and address both current and emerging resource protection issues, it is not necessary to develop criteria for determining when an issue has "emerged." Rather, it is NOAA's intent that CINMS track, assess, prioritize, and determine how best to respond to all issues relevant to protecting Sanctuary resources.

111. Comment: Strategy EI.1 could be sufficient for "emerging issues" - issues that have yet to cause significant harm to Sanctuary resources.

Response: NOAA will implement Strategies RP.1 and RP.2 in identifying, assessing, and responding to all current and emerging issues.

112. Comment: NOAA should dedicate funding to emerging issues so as not to depend on volunteers to research such issues, and should specify who is responsible for implementing Strategy EI.1.

Response: The NMSP dedicates and funds policy analysts, an advisory council coordinator, a team of research and monitoring staff, a boat crew, and education and outreach staff to identify, assess, and respond to emerging issues. The implementation of the Resource Protection Action Plan relies on this existing staff structure, as noted in the implementation section of Strategy RP.1. When an emerging issue requires community input and/or is beyond CINMS's capabilities either technically or fiscally, staff rely on the expertise and knowledge of the Sanctuary Advisory Council and agency partners. For complex emerging issues that require a CINMS response, staff have in the past and can in the future reallocate staff time and budget, as well as leverage other agency resources to adequately address an issue.

113. Comment: The Track Emerging Issues activity of strategy EI.1 should require that CINMS staff relay the findings of their issue tracking activities to the Advisory Council, with whom they collaboratively identified and prioritized the issues.

Response: CINMS staff have provided and will continue to provide regular updates to the Advisory Council on emerging issues.

114. Comment: NOAA should define how it will "track" emerging issues.

Response: The Resource Protection Action Plan identifies the ways in which CINMS will identify and track emerging issues in the Sanctuary.

115. Comment: NOAA should include marine bioprospecting, offshore energy projects (*e.g.*, wind and wave energy), global greenhouse gas emissions, global warming, and squid boat lights in its list of emerging issues.

Response: NOAA has included marine bioprospecting, offshore energy projects, climate change, and wildlife disturbance caused by artificial lighting as emerging issues in the FMP's Resource Protection Action Plan.

116. Comment: The DMP's Emerging Issues Action Plan defers Sanctuary resource protection to a bureaucratic process with no allocated funding, and offers minimal specificity as to when or how management effort will be deployed to mitigate or eliminate impacts from emerging issues.

Response: All CINMS activities ultimately contribute to resource protection, which is the primary purpose of the National Marine Sanctuaries Act. The FMP's Resource Protection Action Plan outlines processes for tracking, assessing, prioritizing, and determining how to respond to current and emerging resource protection issues (processes previously contained in an Emerging Issues Action Plan). These processes are essential to determining how to respond to a given issue at a given point in time, based on the best available information, and depending on available funding and the level of risk or priority for a given issue. Unfortunately, NOAA cannot predict when an issue will become a high priority and what the appropriate response at that time might be. Should, for example, NOAA determine that a given issues warrants development of a new action plan strategy, or perhaps even a new action plan, NOAA's plan for action would be articulated in those documents.

Regarding funding, while the Resource Protection Action Plan's estimated cost table does not reflect potential future investments in CINMS resource protection issues, CINMS does request additional funds to address high priority resource protection issues in a given year as part of its annual budget planning process. Further, the budget table does not show base budget funding (*e.g.*, staff salaries) which is critical

to tracking, assessing, prioritizing, and determining how to respond to current and emerging resource protection issues.

117. Comment: DMP Strategy EI.2 includes several constructive options for addressing resource protection issues, which if implemented could reduce impacts to Sanctuary resources from resource protection issues.

Response: Comment noted.

ENFORCEMENT

118. Comment: NOAA should ensure that sufficient funds/resources are available for enforcement and increase available funding for enforcement.

Response: NOAA recognizes resource limitations and necessary program and partner developments may limit implementation of all of the activities in the management plan. NOAA will continue to work with the Department of Commerce, Office of Management and Budget, and Congress in developing supporting justifications when preparing budget submissions. NOAA allocates funds provided by Congress through annual appropriations for national marine sanctuaries and from other sources of funding (*e.g.*, settlement funds) to enforcement of the NMSA and implementing regulations. In doing so, however, NOAA must balance the need for increased enforcement with other management needs (*e.g.*, science and monitoring, education). NOAA uses these funds to leverage additional investments in enforcement by partner agencies (CDFG, NPS, USCG) to have an effective on-the-water presence in the Sanctuary. NOAA's Office for Law Enforcement, which is funded separately from the Sanctuary budget, also assigns a law enforcement agent to the Sanctuary region.

119. Comment: Team OCEAN should be deleted from the Expanding Enforcement Efforts section, Strategy EE.2 and included in the Public Awareness and Understanding Action Plan.

Response: In addition to traditional enforcement, NOAA employs interpretive enforcement through Team OCEAN, a program that reaches out to boaters to help them understand and comply with CINMS regulations. Team OCEAN will not be administered as a substitute for law enforcement, but can complement those efforts. Team OCEAN will remain in the Emergency Response and Enforcement Action Plan because it is an important tool for both emergency response and enforcement. While Team Ocean is mentioned briefly as an activity within strategy EE.2, it is explained in detail in the Public Awareness and Understanding Action Plan (Strategy AU.3).

120. Comment: NOAA must ensure the regulations for CINMS are legally binding and enforceable, must have a dedicated/exclusive enforcement program for the CINMS, and/or must establish formal partnerships with as many enforcement agencies as possible.

Response: Primary law enforcement responsibilities for NOAA regulations are carried out by the NOAA Office for Law Enforcement (OLE). An enforcement officer stationed in Long Beach conducts investigations into violations of the National Marine Sanctuaries Act and regulatory prohibitions in coordination with State, local and other Federal law enforcement counterparts. In addition, NOAA signed agreements with the State of California, the National Park Service, and the U.S. Coast Guard that provide authorization for local enforcement personnel from these agencies to enforce Sanctuary regulations. They work with NOAA to conduct patrols and investigate potential violations. For example, the U.S. Coast Guard conducts air and sea surveillance within the sanctuary and has broad Federal enforcement authority. NOAA OLE also works with the U.S. Fish and Wildlife Service, the U.S. Environmental Protection Agency, and the Federal Bureau of Investigations (FBI) to investigate violations of

environmental laws within national marine sanctuaries. More information about enforcement of NOAA regulations can be found at http://www.nmfs.noaa.gov/ole/index.html.

The CINMS regulations are legally binding and enforceable. They were drafted with extensive input from NOAA's Office of General Counsel, NOAA Office of Law Enforcement, and our enforcement partners – CDFG, NPS and USCG. NOAA's Office of General Counsel for Enforcement and Litigation also establishes a penalty schedule that outlines recommended penalties for violations under the NMSA. This penalty schedule provides notice to the public and provides guidance to the prosecutors as to a general range of penalties for specific violations. The penalty schedule reflects sanctions that NOAA believes will encourage compliance and deter violations; however, in every case, NOAA retains the ability to assess a penalty up to the statutory maximum of $130,000. The NMSA penalty schedule is publicly available and can be accessed through this link: http://www.gc.noaa.gov/schedules/58-NMSA%20Penalty%20Schedule%209-06.pdf.

121. Comment: NOAA should not issue the new regulations for CINMS and should instead rely on existing regulations and authorities for additional protection.

Response: NOAA carefully examined existing CINMS and other relevant regulations as part of the management plan review, and determined that in some cases strengthening of Sanctuary regulations was warranted, as described in section 2 of the FEIS. NOAA often relies on other agencies' regulations to help protect sanctuary resources. However, sometimes the scope of these regulations is not broad enough to protect sanctuary resources, or may need to be reinforced with parallel sanctuary regulations, which allow for additional enforcement options. NOAA always works very closely with other agencies to minimize potential management conflicts and to promote compliance with sanctuary regulations and the regulations of other agencies.

122. Comment: NOAA should increase, rather than maintain at current levels, vessel and aircraft surveillance operations.

Response: NOAA will pursue opportunities to expand vessel and aircraft based surveillance, but will first focus efforts on maintaining access to existing opportunities and platforms for this activity. To better reflect this NOAA has changed the activity title to "Maintain Effective Vessel and Aircraft Surveillance Operations."

123. Comment: To ensure that CINMS discharge regulations are being complied with, NOAA should conduct snapshot water quality monitoring, perhaps immediately following cruise ship transits through the CINMS, as well as at other key times of high vessel traffic.

Response: CINMS will consider snapshot water quality monitoring during implementation of FMP Strategy WQ.2 - Water Quality Protection Planning.

124. Comment: Commenter strongly supports additional efforts by CINMS to expand enforcement efforts in order to ensure compliance with new and existing Sanctuary regulations, as well as other federal and state laws and regulations.

Response: Comment noted.

FISHING

125. Comment: Several commenters expressed concern about regulating fishing activities under the CINMS regulations and NMSA, making one or more of the following points:

- There is no connection between the overall management of CINMS as both a Sanctuary under the NMSP and an EFH designation under NMFS.

- NOAA should utilize the Magnuson-Stevens process for fishery management, and the Pacific Fishery Management Council should be the body to adopt fishery regulations within the Sanctuary and to ratify any marine reserves designation.

- NOAA has no functional MOU between the NMSP and NMFS concerning marine zoning, fishery management planning, and ecosystem based adaptive co-management.

- NOAA should revise each of the CINMS prohibitions to provide exemptions for all lawfully conducted state and federal fisheries.

- The CINMS has no need or the resources necessary to be involved in fisheries management.

Response: NOAA considers both the National Marine Sanctuaries Act (NMSA) and the Magnuson-Stevens Fishery Conservation and Management Act (MSA) to be tools that can be used exclusively or in conjunction to regulate fishing activities to meet Sanctuary goals and objectives. NOAA evaluates regulatory options on a case by case basis to determine the most appropriate regulatory approach to meet the stated goals and objectives of a sanctuary. If NOAA determines additional regulations on fishing within CINMS are necessary, NOAA will follow the process for developing such regulations in consultation with the PFMC and State, and as directed under section 304(a)(5) of the NMSA.

For example, the recently designated marine reserves in the CINMS resulted from a coordinated regulatory effort among the Pacific Fishery Management Council, NOAA Fisheries and NMSP. Under the MSA, bottom contact gear is prohibited in these zones. The NMSA was used to create no take zones and complement the bottom contact gear prohibition by prohibiting all other extractive activities, including fishing.

NOAA strives for cooperative and adaptive management among its various offices including NOAA Fisheries and the NMSP, and does not typically establish MOUs for this purpose. The NMSP and NOAA Fisheries regularly collaborate to integrate zoning and fishery management by jointly participating in Sanctuary Advisory Council and Regional Fishery Management Council meetings, information and data exchanges, and cooperative enforcement of zoning and fishery regulations within national marine sanctuaries.

Where NOAA has deemed it appropriate, the CINMS regulations provide exceptions for lawful fishing activities.

NOAA has the expertise to determine the goals and objectives necessary to protect the nationally significant resources of national marine sanctuaries. This responsibility extends beyond fishery resources to conservation, recreational ecological, historical, cultural archeological, scientific, educational and esthetic qualities of national marine sanctuaries. If NOAA, in consultation with advisory councils and other stakeholders, determines that fishing regulations are needed to further sanctuary goals and objectives, section 304(a)(5) of the NMSA requires that the sanctuary provide the appropriate Fishery Management Council the opportunity to prepare draft sanctuary fishing regulations for the Exclusive Economic Zone that will fulfill the sanctuary's goals and objectives.

126. Comment: NOAA should add wording to protect rights to fish and recreate in Sanctuary waters in the emergency regulations.

Response: NOAA is not modifying the emergency regulations section of the terms of designation for the purpose mentioned. In the case of an emergency within the Sanctuary, fishing or recreating may temporarily not be appropriate or possible in certain areas. For example, when Alaska Airlines Flight 261 crashed in the Sanctuary in January 2000, a temporary navigational closure was established around the crash site. These emergency provisions are not used lightly, can only be in place temporarily (as long as necessary to respond to the emergency), and are subject to extensive administrative review. Many federal and state agencies have authority to issue temporary emergency regulations in response to emergency situations, such as natural or man-made disasters.

127. Comment: NOAA has completely ignored its commitment to the fishing community at CINMS from the public awareness goal.

Response: NOAA continues to carry out its education and outreach commitment to the fishing community at CINMS. NOAA has engaged the fishing community in the development and delivery of several outreach tools, for example: regulatory brochures, signage at harbors, and guest speaking opportunities to the Sanctuary Advisory Council and general public.

128. Comment: NOAA should recognize the CINMS fishing community as a cultural resource.

Response: NOAA recognizes the importance of the fishing community and provides opportunities for its involvement in Sanctuary research, education, and resource protection activities, such as in development of outreach tools (see also the response to comment 127, and in advising CINMS through the Commercial Fishing and Recreational Fishing seats on the Sanctuary Advisory Council. Moreover, NOAA believes healthy fisheries within a national marine sanctuary are an indication of a healthy ecosystem protected by that Sanctuary. NOAA has already incorporated, and will continue to incorporate, fishing themes into CINMS education and outreach efforts, such as public lectures and weather kiosks. CINMS staff will also continue to work with the fishing community to develop additional fishing-related programs and products.

129. Comment: Reductions in commercial and recreational fishing vessels can result in economic impacts, including impacts on boat owners, the fuel dock, boatyard, and Port District.

Response: In the FEIS, NOAA has concluded that recreational and commercial fishing should experience no significant adverse impacts from implementation of the revised CINMS regulations. Furthermore, these regulations would not result in a "reduction" in commercial and recreational fishing vessels. A number of the regulations provide specific exceptions to accommodate lawful fishing activities. In addition, the management plan includes a number of programs that support boating in general (*e.g.*, safe boating brochure, the Protecting Your Channel Islands brochure), and that should also be helpful to boaters engaged in fishing.

GENERAL COMMENTS

130. Comment: General support expressed for the changes and updates proposed in the management plan, and the associated background information and environmental analysis.

Response: Comment noted.

131. Comment: Broad support expressed for resource conservation and protection, and acknowledgement that the Sanctuary is "moving in the right direction." NOAA should not, however, over-regulate or adopt regulations that are inconsistent with other agencies.

Response: Comment noted.

132. Comment: General support indicated for DEIS Alternative 1 due to concern about increased use of the Santa Barbara channel by cruise ships, interest in long-term protection of resources and existing Sanctuary uses, and concern about protection against predicted future increases in industrialization of the Santa Barbara Channel area.

Response: Comments noted. For additional context, see the responses to comment 283 regarding support for Alternative 1 as it relates to water quality, comment 78 regarding support for the Alternative 1 discharge regulation, comment 176 regarding support for the Alternative 1 lightering regulation, and comment 221 regarding support for the Alternative 1 nearshore vessel approach regulation.

133. Comment: Support expressed for CINMS to retain its current role focusing on and facilitating public and scientific attention on the Channel Islands area, and prohibiting certain industrial extractive activities within the Sanctuary.

Response: Comments noted.

134. Comment: The DMP and DEIS are so large and burdensome that they prohibit real public input.

Response: NOAA believes that the length of the documents is appropriate and necessary to explain the justification for, and analyze alternatives to, the revisions to the Management Plan and associated regulations, as required by the NMSA, the National Environmental Policy Act (NEPA), and other relevant authorities including the Administrative Procedure Act. NOAA believes the organizational structure should allow readers to find information pertinent to their specific interests.

135. Comment: NOAA must update the current policies and programs at CINMS to develop a plan that will enhance protection of Sanctuary resources for future generations, and succeed in achieving the goals and objectives of the National Marine Sanctuaries Act.

Response: NOAA is implementing the changes that will update current CINMS policies and programs, and enhance protection of Sanctuary resources.

136. Comment: Commenters indicated that they would like to incorporate by reference, and/or support all or a subset of the Sanctuary Advisory Council's Conservation Working Group comments.

Response: Please refer to responses to the Conservation Working Group's comments, listed in the table at the beginning of this appendix under "Krop, Linda" and dated July 7, 2006.

137. Comment: NOAA should invest (fiscally or through dedicated personnel) in the National Park Service's long-term kelp forest monitoring program or other marine-based resource monitoring programs to further knowledge of the ecosystem.

Response: NOAA values the kelp forest monitoring program implemented by the National Park Service, and intends to continue providing vessel and staff support to this important program as resources allow. NOAA strongly supports cooperative management of Sanctuary resources by promoting and coordinating the efforts of outside research groups whose work increases understanding of Channel Islands biological and cultural resources. Enforcement, monitoring, education, and outreach efforts are achieved through partnerships with various state and federal agencies, universities, private institutions and non-profit organizations. CINMS provides its partners with opportunities onboard its research platforms, including the R/V *Shearwater* and, historically, the *Seawolf* aircraft. In 2006, CINMS research vessels were at sea

for more than 200 days conducting projects on seabirds, marine mammals, kelp forests, oceanography, intertidal monitoring, and geology in and around the Sanctuary. Further, a proportion of the CINMS annual budget has been and continues to support partner research, monitoring and enforcement activities.

138. Comment: NOAA should consider and be guided by the special and unique nature of the islands and surrounding waters in crafting the Management Plan, regulations, and programs.

Response: The special and unique characteristics of the Islands and surrounding waters were significant factors in the decision to designate the waters surrounding the Islands as a national marine sanctuary, and remain the overarching reason for revising CINMS regulations and implementing a variety of programs.

139. Comment: NOAA should provide adequate resources and funding levels to implement the management plan, especially given increased requirements from the recently designated Channel Islands MPA Network.

Response: NOAA recognizes that resource limitations as well as the necessary program and partner developments may limit implementation of all of the activities in the various management plans. NOAA will continue to work with the Department of Commerce, Office of Management and Budget, and Congress in developing supporting justifications when preparing budget submissions. The Management Plan articulates the full suite of potential CINMS actions for the next five to ten years. However, CINMS's budget may not allow for a high level of implementation of every planned activity. NOAA has described the planned implementation level of each activity in various future funding scenarios (see the FMP Action Plan Summary Table). Regarding funding and marine protected areas see the response to comment 118.

140. Comment: Language in the management plan is subjective and vague.

Response: NOAA has been as specific and transparent as possible in describing planned actions in the CINMS management plan and EIS. As a federal resource management agency, NOAA must meet federal standards of objectivity and transparency in describing the actions and rationale for planned management actions within national marine sanctuaries.

141. Comment: NOAA does not identify the new threats used to justify regulation changes.

Response: NOAA has described threats to Sanctuary resources and qualities that warrant new and revised CINMS actions in the beginning of each action plan under the header "Description of the Issues," as well as throughout the Sanctuary's EIS and in the proposed rule.

142. Comment: NOAA should focus on practical, precise, and prudent CINMS management actions and enforcement, rather than expanding Sanctuary authority beyond its means. Additional changes should only be seriously discussed or considered if these efforts indicate further need of beneficial adjustment.

Response: NOAA considered such concepts prior to proposing the CINMS revised management plan, revised authority and regulations. Per the National Marine Sanctuaries Act, NOAA is required to evaluate sanctuary management plans and regulations at regular intervals. During the course of management plan reviews, NOAA solicits public and agency input to help determine the extent to which Sanctuary management plan changes may be warranted, as well as to help determine the nature of any such changes.

143. Comment: Despite a new Sanctuary office building to be built on the campus of UCSB, NOAA should continue to maintain a public CINMS presence at the waterfront, which is heavily used by both residents and visitors. Most members of the public will not be exposed to the offices at UCSB, because they do not travel there regularly, because of high parking fees, and for various other reasons.

Response: NOAA plans to keep a CINMS office in the Santa Barbara Harbor to support operations of the R/V *Shearwater*, and to maintain a public access contact point at the Santa Barbara Harbor through educational signage and a brochure rack (currently part of Santa Barbara Harbor office). NOAA has also installed a Sanctuary interactive kiosk at the Santa Barbara Harbor and plans to continue a partnership with the Harbor's Outdoors Santa Barbara Visitor Center. In partnership with the Santa Barbara Maritime Museum at the Santa Barbara Harbor, NOAA also intends to maintain and develop public education exhibits relating to maritime heritage.

144. Comment: Support expressed for NOAA's development and support of on-going CINMS partnerships with a variety of local institutions, as well as a focus on water quality and teacher training, all of which is a benefit to the community.

Response: Comment noted.

145. Comment: NOAA should explain how a subset of the NMSA purposes and policies were selected and listed in the management plan's Introduction section, as opposed to listing all of the NMSA's purposes and policies.

Response: The list of purposes and policies provided in the FMP is a complete, verbatim list of the purposes and policies of the NMSA. NOAA has revised the text introducing the list to clarify that it is a complete and verbatim list.

146. Comment: Did NOAA review the original management plan, did it work, and why or why not?

Response: Sanctuary staff thoroughly reviewed the 1983 management plan's goals and objectives, and assessed the extent to which they were accomplished, as well as the continuing relevancy of each. Staff then engaged in a similar discussion with the Sanctuary Advisory Council in 1999. In general, NOAA has made progress towards accomplishing the broad goal areas of the original CINMS plan: resource protection, research, interpretation, and visitor use. Through enforcement of regulations and collaboration with other agencies and constituents NOAA has enhanced protection of Sanctuary resources. NOAA 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. NOAA has developed interpretative programs that enhance public awareness and understanding of the significance of the Sanctuary and the need to protect its resources. NOAA 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. Within the Introduction to the FMP, NOAA has added text to describe the review of the 1983 CINMS management plan.

147. Comment: NOAA has used science to support the notion of new threats in CINMS that is so selective it does not meet basic ethical standards for science. NOAA should provide data to support new threats such as: declines in bird populations, evidence that nutrient cycles are disrupted relative to humans visiting, kelp forests being in decline in fished areas, and showing that predator prey relationships govern ecosystem functions and are compromised with any size frequency data on harvested populations.

Response: NOAA must comply with all federal standards, such as the National Environmental Policy Act, the Administrative Procedure Act, and the Data Quality Act, regarding the use of science. NOAA did not make any of the statements mentioned about Sanctuary resources (declines in bird populations, etc.) in the CINMS management plan. Similarly, NOAA has not made statements in the management plan about a new threat from evidence that nutrient cycles are disrupted relative to humans visiting. However, in the EIS NOAA does discuss and provide references for information indicating that sewage and graywater discharges have the potential to disrupt nutrient cycles. Finally, NOAA has not made statements in the management plan indicating that predator prey relationships govern ecosystem functions and are compromised with any size frequency data on harvested populations.

148. Comment: NOAA should develop a Man in the Biosphere program working group.

Response: The Sanctuary Advisory Council is the body that develops working groups to discuss Sanctuary issues. NOAA recommends that the commenter provide this suggestion directly to the Sanctuary Advisory Council.

149. Comment: NOAA should create a budget for an independent community GIS program to foster social justice and oppose NMSP neo-colonialism.

Response: The NMSA does not direct NOAA to develop social justice programs, and such efforts would be outside the scope of actions proposed in the CINMS management plan. NOAA disagrees with the commenter's assertion that the NMSP is engaged in "neocolonialism."

150. Comment: NOAA should not refer to life forms as "resources" in the text of the management plan.

Response: "Resource" is a broadly defined term in the Office of National Marine Sanctuaries' program wide regulations (15 CFR 922.3) to include all components within a sanctuary that contribute to the conservation, recreational, ecological, historical, research, educational, or aesthetic value of the Sanctuary (15 CFR 922.3). The use of this term does not intend to connote that sanctuary components are valued solely on the basis of their potential for human use or exploitation.

151. Comment: Since people go to the islands to enjoy them, NOAA should regulate without excluding the public, such as dive charter vessels, and without restricting where vessels moor.

Response: Consistent with purposes and policies of the NMSA, NOAA facilitates public and private uses of the national marine sanctuaries to the extent that such uses are compatible with the primary goal of resource protection, and not prohibited by other authorities. The revised CINMS regulations would prohibit most vessels 300 GRT or more from approaching within one nmi of island shores. Such vessels would consequently be precluded from mooring at the Islands. Sanctuary users must also comply with all applicable regulations while in the Sanctuary, not only with CINMS regulations. The California Department of Fish and Game and Channel Islands National Park seasonally limit access to certain nearshore areas of the Islands during seabird nesting.

152. Comment: NOAA should use forward thinking and the best environmental protections to protect the Channel Islands from an array of new threats and pressures, especially since new threats may emerge before the next management plan review.

Response: Strong environmental protections are necessary for the Sanctuary, and the management plan should be forward thinking. The NMSA requires NOAA to review national marine sanctuary management plans at regular intervals. Should any threats to Sanctuary resources arise between management plan review cycles, NOAA can take action to address such threats without engaging in a

management plan review process, consistent with applicable authorities (see Resource Protection Action Plan Strategy RP.2).

153. Comment: The CINMS management plan should connect management of coastal resources with the Sanctuary, recognizing that there is connectedness between a lot of pelagic fish species and the Sanctuary. NOAA should not manage the Sanctuary as if it is isolated from these other areas.

Response: NOAA manages CINMS resources with the understanding that the Sanctuary exists in a coastal ocean environment within which administrative boundaries do not provide a barrier between resources inside and outside of the Sanctuary. Pelagic fisheries in the Sanctuary region are managed by NOAA Fisheries (with recommendations from the Pacific Fishery Management Council) under the MSA, as well as by the California Department of Fish and Game. CINMS consults with these and other partner resource agencies regarding any implications for Sanctuary resources that may result from management actions both within and outside of the Sanctuary. In addition, the NMSP West Coast Region works to integrate strategies and programs across west coast national marine sanctuary sites, and also to coordinate efforts with other federal, state, local, and regional ocean management agencies. See also the response to comment 31 for information about marine ecosystem extents and expanding the Sanctuary.

154. Comment: NOAA should demonstrate, through specific CINMS programs, that it encourages compatible use. This is an important component in boosting CINMS's image as being friendly to local interests.

Response: NOAA encourages compatible use through several CINMS program areas. Education and outreach programs, for example, develop and distribute the "Protecting Your Channel Islands," "Boating & Safety," and the "Protecting Our Seabirds" brochures with this purpose in mind (see also the response to comment 101). These brochures provide information and helpful tips about various activities people may enjoy in the Sanctuary, such as diving and fishing, and how to do so in a safe and responsible manner. In addition, several pages on the CINMS web site provide information about how to get to the islands, as well as information about the best times of year to engage in certain activities. The CINMS Maritime Heritage Program provides information to divers about recommended shipwreck dive sites, while Research and Monitoring Program staff work closely with researchers from all over the world to facilitate appropriate research within the Sanctuary. The Sanctuary Advisory Council includes members from diverse user groups, several of which have active working groups.

155. Comment: Frustration expressed that NOAA, at the time the DMP/DEIS was released, was still only at the stage of developing a process for dealing with marine reserves and boundary expansion issues, both of which have received strong public support in the Ventura and Santa Barbara communities.

Response: NOAA believes in ensuring that the best available science is used in national marine sanctuary decision making, and in dedicating sufficient resources to each environmental review project. NOAA values the public support for processes to consider establishing marine reserves within the Sanctuary, and to evaluate the Sanctuary boundary. NOAA has since completed implementation of a network of marine reserves and marine conservation areas within the Sanctuary (72 FR 29208). NOAA determined that the best manner in which to evaluate the CINMS boundary was to first conduct a comprehensive biogeographic assessment of the Sanctuary and surrounding environment. Now that the biogeographic assessment is complete, given sufficient resources, NOAA plans to initiate the environmental review process for boundary evaluation at an appropriate time in the future.

156. Comment: The management plan update process that started in 1999 has been very lengthy and the remaining steps of converting the draft plan to final should be completed as expediently as possible.

Response: NOAA values the efforts of everyone involved in the CINMS management plan review to date. The length of this review is due to many factors, including that the CINMS management plan review was the first comprehensive management plan review the NMSP initiated for the national marine sanctuaries designated prior to 1995. The CINMS management plan review was also lengthened in order to address issues concerning large vessel discharge raised by the California Coastal Commission and others during the public comment period on the DMP/DEIS. NOAA determined that addressing such issues required development of an SDEIS, and providing a supplemental public comment period.

157. Comment: The management plan's action plans should be both well funded and adequately staffed, perhaps with the assistance of the NMSP's West Coast Region, to carry out the Sanctuary's programs and objectives.

Response: As part of the management plan review process, CINMS staff worked to prioritize the strategies and activities in the management plan's action plans (see Appendix A1 of the FMP for a table identifying how each activity will be maintained or implemented in the future). Staff from the West Coast Regional Office (WCRO) work on management issues that are primarily regional in scope; they also work with individual sanctuaries on priority management activities that would benefit from the WCR staffs' expertise.

158. Comment: The management plan should include a Memorandum of Understanding (MOU) between various Federal and State agencies, including the Coastal Commission, to better respond to current water quality issues and conditions. The MOU should reflect the Plan for California's Nonpoint Source Pollution Control Program.

Response: Although NOAA does not envision drafting an MOU among various Federal and State agencies as a direct activity associated with this CINMS management plan review, the agency recognizes the important role of MOUs in better articulating roles and responsibilities among the multitude of management authorities that typically exist within national marine sanctuary regions (see Strategy OP.3 in the FMP for a description of how the NMSP formalizes relationships with other authorities). The NMSP has implemented several MOUs across the sanctuary system (including several at CINMS) and, if appropriate, may do so again in the CINMS region sometime in the future. This could involve MOUs related to water quality protection. NOAA recognizes the importance of state agency partners, and the value of consistency among respective programs to the extent practicable.

159. Comment: The management plan's Action Plan activity "status" descriptions should be explained in more detail to include specific dates, if possible, or at least be revised to include some definition of the phrase "years 1-5."

Response: NOAA has included specific dates, where possible, to describe the status of activities in the FMP. NOAA has added information to explain the meaning of years 1-5, which now appears in the FMP's Action Plan Background section entitled, "How Are Action Plans Organized?"

160. Comment: The DMP's description of the Sanctuary Setting could be augmented by recent information that has been recently made available through the NCCOS Biogeographic Assessment report.

Response: NOAA has revised FMP text to reference the biogeographic assessment (NCCOS 2005).

161. Comment: The islands are special, unique, and Congressionally recognized as a place for extra protections, whereas there are other areas to take large vessels and personal watercraft.

Response: Comment noted.

GLOBAL CLIMATE CHANGE

162. Comment: NOAA should address climate change/global warming and its effects on Sanctuary resources. NOAA should: 1) formally acknowledge the threat of global warming and work to better understand how global warming may affect Sanctuary resources, 2) reduce greenhouse gas emissions associated with CINMS operations, and 3) advocate, through appropriate administrative channels, for the deployment of a national response to global warming to reduce its impacts on the climate, and thus on CINMS resources.

Response: NOAA has added language to the FMP's Resource Protection Action Plan that explains how the NMSP and NOAA are assessing potential climate change impacts on national marine sanctuaries and how such impacts may be mitigated. NOAA has also added a strategy to the FMP's Operations Action Plan that discusses how CINMS is working to green its operations. Finally, NOAA has added information to the FMP's Conservation Science Action Plan strategy CS.3, about pursuing development and future monitoring of a carbon budget for the Sanctuary. NOAA would consider data and findings from this work as part of its collective scientific efforts to inform climate policy.

GOALS

163. Comment: NOAA should explain why the old and new CINMS goals are so different.

Response: In general, goals from the 1983 CINMS management plan are encompassed within the new goals articulated in this FMP. NOAA revised the CINMS management plan to better explain that the original goals are missing several important concepts and nuances encompassed in the National Marine Sanctuaries Act and reflected in the new goals for the Sanctuary (as revised for the FMP).

164. Comment: NOAA should clarify if the CINMS goals presented in the management plan are new, and who decided upon them.

Response: NOAA determined that CINMS goals should directly reflect the overarching mission of the ONMS and be derived from the purposes and policies of the NMSA, as enacted by Congress. All of the seven goals provided in the DMP were paraphrased from section 301 of the NMSA. NOAA has since decided to use language taken directly from NMSA section 301, rather than to paraphrase it. NOAA has also added two goals that contain concepts from NMSA section 301 that were previously missing from the CINMS goals, and additional explanation regarding goal development.

165. Comment: CINMS goal four (*i.e.*, provide comprehensive and coordinated conservation and management of these marine areas, as well as the activities affecting them, in a manner complementing existing regulatory authorities) has yielded new prohibitions that are vague and enabling, duplicate other regulations, and are inconsistent with the CINMS charter. NOAA should rewrite the goal to state "…complementing, but not duplicating…."

Response: The new prohibitions are not inconsistent with the CINMS terms of designation (referred to above as the "charter"). Furthermore, the NMSA provides authority for, among other things, "…comprehensive and coordinated conservation and management of these marine areas, and activities affecting them, in a manner which complements existing regulatory authorities." The CINMS terms of designation acknowledge that the NMSA "authorizes the promulgation of such regulations as are reasonable and necessary to protect the values of the Sanctuary." As evidenced by the analysis in the EIS, the new prohibitions meet this criterion.

While CINMS may have similar regulatory prohibitions as another agency, NOAA has crafted CINMS regulations to be complementary. Further, the NMSA provides a different suite of penalties than available under another regulatory authority.

166. Comment: Ecosystem-based management is adaptive, but given that it has been 25 years since the last management plan, it is not clear whether sanctuary goals are adaptive.

Response: CINMS goals directly reflect the findings and purposes and policies of the NMSA. These findings, purposes and policies are very broad, encompass all of the actions identified in the FMP, and have been adapted several times during reauthorization of the NMSA by congress. In turn, the CINMS goals are broad enough that CINMS can adapt its management actions as necessary.

167. Comment: NOAA should make the CINMS goals more consistent with the NMSA by using the word "facilitate" instead of "allow" in goal six, by encouraging compatible public and private commercial and recreational use, and by adding goals for science and monitoring.

Response: NOAA has revised the CINMS goals to make them more consistent with the NMSA. A new goal three regarding support for science and monitoring has also been included.

168. Comment: CINMS has not honored its commitments to programs and stonewalled basic data management. CINMS goals five, six, and seven are empty promises with no budget.

Response: FMP Strategy CS.2 is dedicated to comprehensive data management. Regarding goal five (now six), NOAA believes the CINMS marine zoning process demonstrates strong models for conserving and managing national marine sanctuaries and applying innovative management techniques. Regarding goal six (now seven), CINMS provides education and outreach materials aimed at facilitating public and private uses of resources that are compatible with resource protection. These materials help Sanctuary users understand and learn about activities they may enjoy within the Sanctuary, and where certain types of activities are prohibited. Regarding goal seven (now eight), CINMS cooperates regularly with national and international programs encouraging conservation of marine resources. CINMS frequently hosts international delegates interested in learning about Sanctuary issues and how CINMS is addressing them. CINMS staff also represent the ONMS and NOAA in exchanges with marine resource management agencies in other countries, and participate in international conferences focused on marine conservation. CINMS staff also often cooperate with national programs encouraging conservation of marine resources (see the FMP for specific examples). The FMP does not describe a budget for each goal. Budgets are developed for action plans, which are designed to meet CINMS goals.

INTRODUCED SPECIES

169. Comment: Commenters support the Sanctuary's new introduced species prohibition, efforts to prevent the release of introduced species in the Sanctuary, and the exemption under this prohibition for striped bass released during catch and release fishing."

Response: Comment noted.

170. Comment: The prohibition on releasing introduced species may conceivably put an angler in a position of non-compliance with regulations from other entities if the angler catches an introduced species that is not legal to catch (per such other entities), but the angler cannot release it due to the CINMS prohibition. The final regulation should leave an angler with a safe and legal course of action.

Response: NOAA is not aware of any state or federal fishing regulations that would require an angler to release an introduced species caught in the Sanctuary. Thus, complying with this regulation on releasing introduced species would not place an angler in a position of non-compliance with regulations from other entities. Furthermore, NOAA encourages recreational anglers to assist in collecting information about introduced species by keeping specimens and sharing them with NOAA and other resource management agencies, such as the California Department of Fish and Game.

171. Comment: The regulation prohibiting the introduction of introduced species should have an exemption for aquaculture or mariculture activities pursuant to a valid lease, permit, license, or other authorization.

Response: Intentionally introducing species or experimenting with new introduced species is not an appropriate activity in national marine sanctuaries because introduced species may threaten the diversity or abundance of native species or the ecological stability of waters in which they occur. They may also threaten commercial or recreational activities dependent on sanctuary waters. 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). Although national marine sanctuaries retain authority to address this threat to Sanctuary resources, the NMSP would work very closely with the State of California regarding any aquaculture proposals that might arise in the Sanctuary area.

172. Comment: NOAA should add a specific action plan in the Education and Outreach area to educate Sanctuary users how to comply with the prohibition on introduced species, such as a "Keep your boat bottom clean!" information brochure.

Response: Education, especially boater education, about introduced species is important. Introduced species in the Sanctuary are an emerging resource protection issue. The FMP action plans are meant to be living documents that incorporate the most current resource issues in the Sanctuary into our plans and programs. NOAA has not added a separate action plan on introduced species; however, CINMS plans to incorporate education about introduced/invasive species into education programs and materials. The Long-term Monitoring and Experiential Training for Students (LiMPETs) program (Strategy AU.1, activity 5) monitors algal and invertebrate species on the Channel Islands and may be a program where invasive species education can be incorporated. CINMS staff also participate in annual efforts sponsored by the Santa Barbara Waterfront Department and California Department of Fish and Game to remove the invasive Japanese kelp, *Undaria*.

FMP Strategy AU.6, activity 1(Boater Safety Tips Brochure) also addresses introduced species by including information related to boating safety, regulations on discharge in the ocean and sanctuary, clean boating practices, and local marine refuse stations. Additionally, as explained in Strategy AU.6, activity 5, CINMS participates in a variety of outreach events each year including whale festivals, harbor festivals, boat shows, and dive industry events. These events include boater outreach where education about a variety of CINMS regulations and issues, including aquatic nuisance/invasive species, is shared with the public and boaters. Any tool or product mentioned under Strategy AU.6 will be updated to reflect any changes to CINMS regulations.

173. Comment: NOAA should explain how Sanctuary research vessels are going to comply with the new prohibition on introduced species, especially given that they are docked in a port containing invasive species.

Response: CINMS regularly inspects and cleans its vessels and equipment in order to minimize the risk of our activities being a vector for introduction of invasive species. CINMS is also working with the

Santa Barbara Waterfront Department to assess and mitigate the threat of invasive Japanese kelp in Santa Barbara Harbor.

174. Comment: Given that the proposed Sanctuary prohibition on introduced species is largely redundant of State regulation, the Sanctuary should support the existing, spatially comprehensive authorities that are addressing the invasive species problem, especially where the Sanctuary is at risk.

Response: NOAA supports existing regulatory authorities on introduced species. However, the CINMS regulation for introduced species differs from similar laws and regulations in that it: 1) would provide place-based protections specifically for CINMS; 2) would prohibit transgenic species introductions in both state and federal waters of the Sanctuary; and 3) would prohibit introducing or otherwise releasing species beyond the one nmi offshore Channel Islands National Park boundary. Furthermore, the introduced species regulation would establish a deterrent against intentional and unintentional introductions or other releases of introduced species into the Sanctuary through civil penalty (up to $130,000 per incident, per day) under the NMSA. Finally, this regulation would prohibit introductions of species native to California, but not native to the ecosystems of the Sanctuary.

175. Comment: NOAA should clarify the burden of proof for enforcing the prohibition on introducing introduced species by adding an "intent to release" provision.

Response: NOAA enforcement personnel maintain prosecutorial discretion in determining whether or not to prosecute violators of CINMS regulations. NOAA is not incorporating "intent to release" into the language of the prohibition because it does not think there should be a requirement of intent in the regulation.

LIGHTERING

176. Comment: NOAA should adopt the prohibition on lightering included in Alternative 1 to further Sanctuary resource protection, protect against lightering related oil spill impacts, and further protect water quality.

Response: NOAA has decided not to include the lightering prohibition in the CINMS regulations at this time because large scale vessel lightering does not occur in the Sanctuary, and NOAA does not believe it is likely to become a common practice given the Sanctuary's geographic location (*i.e.*, its distance from major ports), the Area to Be Avoided that advises large vessels to avoid the majority of the Sanctuary (excluding the TSS), and the established traffic patterns within the Sanctuary (*e.g.*, large vessels typically transit the Sanctuary through the TSS). Regarding smaller vessels, NOAA understands that the occasional practice of sharing fuel between boats (also a form of lightering) may occur, and that this practice may help prevent other possible problems such as vessel groundings. For now, existing prohibitions against discharges into the Sanctuary will be used to address spills associated with small-boat to small-boat fuel transfers. Should lightering become an issue that NOAA deems necessary to regulate in the future, NOAA may consider proposing a Sanctuary lightering regulation. Although NOAA is not prohibiting lightering activities at this time, all vessels must still comply with the CINMS discharge and deposit regulation.

177. Comment: The lightering prohibition in Alternative 1 should include an exception for emergencies. For example, if a vessel loses power, drifts into and becomes embedded in the islands, it would need to be lightered.

Response: NOAA is not including the lightering prohibition in the CINMS regulations at this time (see the response to comment 176). However, note that the lightering prohibition described in Alternative 1,

as with most Sanctuary regulations, includes an exception for "an activity necessary to respond to an emergency threatening life, property, or the environment."

LIQUEFIED NATURAL GAS

178. Comment: NOAA should prohibit Liquid Natural Gas projects within CINMS boundaries. NOAA should also address impacts from LNG projects outside the Sanctuary boundary through early consultation with project applicants and permitting agencies. If such projects would harm Sanctuary resources, they should not be permitted. NOAA should also maintain adequate enforcement effort so that if LNG projects violate CINMS regulations, such as the discharge regulation's "enter and injure" clause, or the introduced species regulation, the violations are prosecuted and properly mitigated.

Response: CINMS regulations include prohibitions on disturbing the seabed, and discharging or depositing within the Sanctuary in the absence of a sanctuary permit. Installing and operating LNG terminals within CINMS would likely involve such activities. If an LNG project applicant were to seek permits for activities that would otherwise be prohibited by CINMS regulations, it is unlikely that such a project could meet the criteria for issuance of a CINMS permit.

The presence of the Sanctuary is recognized as important in decisions regarding permits for LNG projects in the region, and was recently cited by the Governor of California as part of his rationale for denying the Cabrillo Port LNG proposal. Any LNG project proposed outside the Sanctuary, but in the Sanctuary region, would likely be subject to consultation per section 304(d) of the NMSA, which requires that federal agency actions internal or external to a national marine sanctuary, including private activities authorized by licenses, leases, or permits, that are likely to destroy, cause the loss of, or injure any Sanctuary resource, are subject to consultation with the NMSP. This provision of the NMSA provides NOAA with the opportunity to formally recommend alternative courses of action for the applicant. NEPA, the APA, and the Deepwater Ports Act also provide opportunity for inter-agency consultation. In addition, the Sanctuary prohibition on discharging or depositing from beyond the boundary of the Sanctuary any material or other matter that subsequently enters the Sanctuary and injures a Sanctuary resource or quality would apply to discharges/deposits from LNG projects located outside the Sanctuary.

NOAA law enforcement efforts for CINMS will continue per the cooperative mechanisms currently implemented in the Sanctuary. For more detail on cooperative enforcement efforts, see the response to comment 120.

MARINE BIOPROSPECTING

179. Comment: In the DMP, NOAA inappropriately identified as "marine bioprospecting" a research project that was funded by MMS in conjunction with the University of California at Santa Barbara (UCSB) This term as used in the DMP implies a sustained removal or harvesting of a marine resource. However, the UCSB project was a limited time sampling of marine organisms on oil and gas platforms, the purpose of which was to isolate compounds with anti-cancer and anti-inflammatory potential for further research. Ultimately, the goal of any such successful compounds would be synthesis of the new drugs in laboratories rather than purification of these from collecting.

Response: The referenced project was appropriately identified as marine bioprospecting. As stated in the DMP and in the FMP, marine bioprospecting is the activity of seeking a useful application, process, or product in nature. However, NOAA has added further explanation of the MMS-UCSB research project to the FMP.

MARINE DEBRIS

180. Comment: The FMP's Offshore Water Quality Monitoring Strategy should include systematic monitoring of anthropogenic marine debris, per a recommendation in the Sanctuary Advisory Council's 2005 report: *A Water Quality Needs Assessment for the Channel Islands National Marine Sanctuary*.

Response: NOAA has been working and will continue to work in partnership with the marine debris researchers from the University of California Davis and the Algalita Marine Research Foundation to conduct surveys of and remove marine debris from the Sanctuary. The NOAA Marine Debris Program has supported some of this work, and CINMS staff look forward to pursuing additional opportunities to work with this Program. For more information about CINMS's future plans to address water quality issues, including marine debris, see the response to comment 303.

181. Comment: The impact of marine debris and derelict fishing gear on natural and cultural resources in the CINMS is not well understood and deserves to be investigated.

Response: As mentioned in the FMP's Maritime Heritage Action Plan (Strategy MH.1, Activity 2), during regular monitoring of cultural resource sites, divers will remove marine debris and derelict fishing gear when it is feasible and safe to do so. With regard to understanding impacts on natural resources, NOAA is supporting marine debris removal work within CINMS (see the response to comment 180) that is improving our understanding of the extent and potential impacts of lost fishing gear.

MARINE RESERVES

182. Comment: General support expressed for NOAA's efforts to complete the establishment of the Channel Islands MPA network.

Response: Comment noted.

183. Comment: A crucial data gap exists for marine reserve monitoring in that a spatially explicit data set of commercial and recreational fishing does not exist, or is poor. NOAA should analyze the potential of the Sanctuary's aerial survey program for filling this gap by providing all or part of a spatial depiction of current fishing effort.

Response: NOAA has analyzed the Sanctuary's aerial survey data, in conjunction with other spatially explicit relevant information to depict current fishing effort. NOAA provided this analysis in the FEIS on marine reserves (http://channelislands.noaa.gov/marineres/main.html).

184. Comment: NOAA should aggressively defend the NMSP's jurisdiction over the establishment and management of marine reserves within the existing Sanctuary boundaries.

Response: In 2007, NOAA completed a Final EIS and Final Rule that established a network of marine zones, including marine reserves, in the federal waters of the Sanctuary (three nmi to six nmi) (72 FR 29208).

185. Comment: The management plan indicates a bias toward area closures over other forms of management (see DMP strategies CS.6 and MZ.2). Closures purported to be precautionary are questionable. In addition to area closures, NOAA should consider the effectiveness of methods to attain resource protection goals, improve and recover habitat and fisheries, such as: restricting trawling and other bottom tending gear, restricting fishing during spawning seasons, size/slot limits, bag limits, catch and release, and closure of a particular fishery for a period of time (successful with Atlantic striped bass,

and Gulf of Mexico Red Drum). NOAA should also take a more comprehensive management based approach, which would protect all areas within the Sanctuary. This could include integrating the results of various research components to assist all management strategies, not just marine reserves.

Response: NOAA considered a wide range of management measures in developing the FMP and associated regulations. Marine zoning is an important and effective marine management tool that, when coupled with other management tools, provides the Sanctuary and its resource management partners a wide range of management approaches. The NMSP action related to marine reserves is addressed in a separate NEPA action, see http://channelislands.noaa.gov/marineres/main.html. Full consideration and review was given to existing and traditional fishery management approaches to marine resource management. NOAA determined that existing and traditional fishery management approaches are not sufficient to meet the Sanctuary's goals. The State of California reached a similar conclusion in adopting the state waters portions of the network.

186. Comment: Regarding strategy CS.6 (Marine Reserves Monitoring), the Pacific Fishery Management Council would be a valuable source of information on management measures that have been successful in protection of both habitat and fisheries.

Response: Comment noted. The NMSP has consulted with the PFMC extensively and will continue to engage the PFMC for their fishery management information and expertise. The NMSP also formally consults with the PFMC on matters concerning fishing regulations and Sanctuary resources through NMSA sections 304(d) and 304(a)(5).

187. Comment: Regarding strategy CS.6 (Marine Reserves Monitoring), the intent of the activity entitled, 'Utilize Existing CINMS Research and Monitoring Programs in Support of Marine Reserves,' is unclear. The programs listed in the activity are programs to document the status of all of the sanctuary. It is difficult to see how such activities "support" marine reserves. It also seems to imply that CINMS, prior to completing the marine reserves designation process in federal waters, expects to promote such reserves as a means to address habitat, seabird and kelp preservation.

Response: Marine reserves are expected to have both direct and indirect effects within and outside their borders. Many of the existing CINMS research and monitoring programs were originally designed to broadly measure change and gauge the overall health of Sanctuary resources. However, in some cases they can be adjusted to specifically monitor marine reserve performance as well as the sanctuary as a whole. For example, the Channel Island National Park's and PISCO's kelp forest ecosystem monitoring programs' sampling designs have been modified to increase their ability to measure change over time in marine reserves in comparison to nearby control areas.

188. Comment: DMP Strategy MZ.2 (Consideration of Marine Reserves and Conservation Areas), contains language in the activity that is unclear regarding the purpose of Pacific Fishery Management Council (PFMC) regulations because it seems to suggest that a marine reserve determination has already been made.

Response: Language in the DMP was not intended to suggest that a final determination about federal marine reserves designation within CINMS had been made prior to conclusion of the consultative process with the PFMC. In May 2005, NOAA presented the PFMC, per section 304(a)(5) of the NMSA, with an opportunity to prepare draft fishing regulations to meet the goals of the CINMS marine zones. Section 304(a)(5) requires that the relevant Fishery Management Council be given the opportunity to prepare draft fishing regulations within the Exclusive Economic Zone (EEZ) of the sanctuary (the CINMS EEZ is from 3 to 6 nm offshore the northern Channel Islands). The PFMC responded and recommended that fishing regulations for the CINMS marine zones in federal waters be implemented through the existing

authorities of the MSA and the State of California. In November 2005, the PFMC directed its staff to work with NOAA Fisheries to implement fishery closures within the CINMS zones consistent with California law.

In 2006, to mitigate fishing impacts to groundfish essential fish habitat (EFH), the PFMC approved Amendment 19 of the Pacific Coast Groundfish Fishery Management Plan that, in part, recommended designation of the CINMS as EFH and the existing and proposed CINMS marine zones as Habitat Areas of Particular Concern (which have corresponding regulations to prohibit fishing). Based on a review of the existing factual and scientific evidence, NOAA promulgated regulations prohibiting the use of bottom-contact fishing gear in these areas under the MSA.

The NMSA was used to complement the bottom contact gear prohibition and create no take zones that prohibit all other extractive activities, including fishing. The FMP has been updated to reflect the conclusion of the designation process for the Channel Islands MPA Network.

MARINE ZONING

189. Comment: Commenter supports both activities outlined under the DMP's General Marine Zoning Strategy (MZ.1).

Response: Comment noted. This strategy is now RP.3 in the FMP's Resource Protection Action Plan.

190. Comment: The management plan's Marine Zoning Action Plan should provide a spatial representation of all restrictions/zones, and regulations with a spatial feature in the Sanctuary.

Response: NOAA has augmented the discussion of existing zones within the Sanctuary in the FMP's Resource Protection Action Plan (Strategy RP.3 background section). Although NOAA agrees that a spatial database of various marine zones, data, and features is important and useful for Sanctuary management, a map that attempts to show the complex spatial management and regulatory regimes within CINMS would be overwhelming and complicated to display, and may not prove useful for coastal managers or the general public. NOAA has been developing a spatial database of management zones within and adjacent to CINMS, as well as biological and socioeconomic monitoring activities.

191. Comment: NOAA should consider using marine zoning for: derelict/abandoned fishing gear, vessel traffic, light pollution, corals and structure-forming organisms, and bottom-tending fishing gear.

Response: Bottom-tending fishing gear is now prohibited within the marine zones designated as marine reserves and marine conservation areas in the Sanctuary. NOAA is not establishing additional marine zones to address the remainder of the issues mentioned at this time for reasons including insufficient information available to support such action, non-zoning measures already in place, or pre-existing zones. NOAA does, however, regard marine zoning as an important tool for consideration and application where appropriate. As described in the FMP's Resource Protection Action Plan, NOAA will identify, track, and where appropriate, respond to Sanctuary resource protection issues. For some issues, the evaluation process may include consideration of marine zoning, where appropriate.

MILITARY ACTIVITIES

192. Comment: The Department of Defense should not continue to be exempt from CINMS rules because it has a bad record of disturbing, harming, and killing endangered species with underwater sonar, which should not happen in the Sanctuary.

Response: The NMSP works closely with NOAA Fisheries regarding assessment of the potential impacts of DOD activities on Sanctuary resources, and how DOD should address such potential impacts. As the revised CINMS regulations state, in the event of destruction of, loss of, or injury to a Sanctuary resource or quality resulting from an incident, including, but not limited to, discharges, deposits, and groundings, caused by a DOD activity, DOD, in coordination with the Director, must promptly prevent and mitigate further damage and must restore or replace the Sanctuary resource or quality in a manner approved by the Director. Furthermore, all DOD activities must be carried out in a manner that avoids to the maximum extent practicable any adverse impacts on Sanctuary resources and qualities.

193. Comment: NOAA should remove the exception for military vessel discharge of sewage and sewage sludge from the discharge prohibition.

Response: NOAA has determined that the regulation of military vessel discharges by section 312(n) of the FWPCA (Clean Water Act) is sufficient at this time.

MINERAL ACTIVITIES

194. Comment: Commenter supports the proposed prohibition on mining activities within the Sanctuary.

Response: Comment noted.

MOTORIZED PERSONAL WATERCRAFT (MPWC)

MPWC – INAPPROPRIATE USE OF STUDIES

195. Comment: Studies cited and information used to support the proposed MPWC prohibition were outdated, inaccurate, of poor quality, biased, and/or from locations other than the Channel Islands.

Response: NOAA consulted a variety of sources in developing the prohibition on MPWC operation within one nmi of the Channel Islands. The sources comprise available literature on MPWC impacts, as well as existing enforcement data from CINP Rangers and other enforcement agencies. NOAA is not aware of any MPWC impact studies conducted in the Channel Islands. This is not surprising, given that the National Park Service has banned the use of MPWC in the Channel Islands since 2000. Given this lack of site-specific data for MPWC impacts, the data and observations from other locations (including the Monterey Bay National Marine Sanctuary) are relevant to CINMS, especially data on flushing of nesting birds and disturbance of marine mammals. NOAA has received written and oral reports of MPWC users disturbing sea otters, harbor seals, porpoise, dolphin and other wildlife in various areas of the Monterey Bay National Marine Sanctuary since implementation of the regulation in 1993. Sometimes, due to high surf conditions, operators are unaware of their disturbance of wildlife.

196. Comment: In citing information from the Massachusetts Office of Coastal Zone Management Personal Watercraft Management Guide (MOCZM 2002), CINMS irresponsibly selected particular passages that support a PWC ban, from a document that advocates managing PWC use and provides much data to support management tactics short of bans. In addition, the MOCZM document was published in 2002 and could not, at that time, include the most up to date technological innovations. CINMS should seek the most current, accurate and peer reviewed data.

Response: Regarding the MOCZM document advocating managing MPWC use, this document proposes a variety of different management techniques regarding MPWCs, including an outright ban for particularly sensitive or difficult enforcement areas. CINMS fits both of these criteria, with many rare,

endangered or sensitive species and a remote environment which makes behavior-based enforcement impossible without extensive enforcement resources. Moreover, CINMS is not banning MPWC throughout the Sanctuary, but only in the sensitive nearshore zone from zero to one nmi offshore. The amount of scientific research conducted on the topic of MPWCs and wildlife disturbance has not increased significantly since 2002. However, additional information on MPWC use has been added to the FEIS Affected Environment, Human Uses, Nonconsumptive Recreation and Tourism section on Motorized Personal Watercraft for revisions.

MPWC – AGAINST BAN

197. Comment: NOAA should not prohibit MPWC from operating within one nautical mile of the Channel Islands.

Response: As explained in the response to comment 200 NOAA believes that the Sanctuary prohibition on MPWC's within one nautical mile of the Channel Islands will assist in achieving the NMSP's primary mandate of resource protection. Because the NPS already prohibited MPWC operation within one nautical mile of the islands in 2000, the Sanctuary MPWC prohibition would not result in adverse socioeconomic impacts. NOAA does not prohibit any individuals from visiting the Sanctuary or the Islands, and this prohibition is not designed to keep some members of the public from doing so.

198. Comment: NOAA should not ban MPWC use beyond one nmi in the Sanctuary because this would prohibit MPWC use at a known tow-in surfing location.

Response: NOAA is not prohibiting MPWC use beyond one nmi. NOAA is aware of tow-in surfing activities off San Miguel Island; however, the tow-in surfing location is beyond one nmi and as such would not be affected by the Sanctuary prohibition.

MPWC – BEHAVIOR

199. Comment: NOAA should address/prohibit unacceptable MPWC operator behavior, and/or wildlife disturbance (except for fishing) rather than prohibit MPWC use.

Response: NOAA is not considering the ideas suggested as an alternative to the prohibition on MPWC use within one nmi of the Channel Islands because the use of MPWC in this zone has already been prohibited by the NPS since 2000.

MPWC – DUPLICATIVE REGULATION

200. Comment: NOAA should not duplicate the existing NPS regulation that prohibits MPWC operation within one nmi of the Channel Islands.

Response: The use of MPWC within one nmi of the Channel Islands has been prohibited by the NPS since 2000. NOAA is mirroring the existing MPWC prohibition to provide an added deterrent to illegal MPWC use within the nearshore areas of the CINMS and CINP (the CINMS regulation carries a maximum civil penalty of $130,000 per incident, per day). The CINMS MPWC prohibition provides an additional legal authority through which to prosecute violators of the MPWC prohibition.

MPWC – ENVIRONMENTAL IMPACTS

201. Comment: NOAA's characterization of MPWCs as producing high emissions, being noisy, and/or being hazardous to the ocean and environment is incorrect. New MPWC designs are clean and quiet.

Response: The MPWC industry has reduced noise and emissions with 4-stroke engines, and NOAA has revised the description of MPWC in the DEIS. See the updated FEIS Affected Environment, Human Uses, Nonconsumptive Recreation and Tourism section on Motorized Personal Watercraft for revisions. However, NOAA is not aware of studies that have demonstrated the extent to which these improvements have reduced wildlife disturbance. NOAA's prohibition on the operation of MPWC within one mile of the islands is due primarily to the potential for wildlife disturbance rather than concerns about emissions. While emissions and noise from MPWC have been reduced, it is not clear that they are now insignificant. NOAA is still concerned about the effects of oscillating sound caused by persistent throttling of the engine during repeated acceleration/deceleration within the surf zone, which is often necessary to avoid capsizing and rolling. Research and observations have shown that this frequent oscillating sound pattern is particularly disruptive to wildlife. Finally, NOAA is unaware of information indicating the immediate breakdown of oil from MPWCs.

202. Comment: MPWCs have less of an impact on kelp and aquatic vegetation than do other vessel types, as discussed in the Massachusetts Office of Coastal Zone Management Personal Watercraft Management Guide (MOCZM 2002).

Response: The potential for damage to aquatic vegetation is reduced in MPWCs as compared with that for propeller driven vessels. However, the referenced document (MOCZM 2002) also makes the following statement about PWC operation: "However, PWC are frequently operated in ways that enhance their capacity to damage seagrass communities. For example, PWC are often used in shallow water areas, where their jet wash is more likely to kick up sediments. PWC also tend to kick up more sediment when operators are performing acrobatic maneuvers, traveling at slower speeds or rapidly accelerating. These activities tilt PWC back into the water column and direct their jet wash downward into underlying sediments and seagrass beds. PWC-related seagrass damage may also be exacerbated if PWC operation is spatially and/or temporally concentrated. Multiple PWC circling about in that same vicinity may have a greater impact than a single PWC traveling through the same area." With respect to MPWC impacts on kelp beds, the enclosed propulsion system of MPWC will not cut through kelp as will vessels with conventional outboard motors. The EIS text referring to impacts on kelp has been revised to reflect this information.

203. Comment: The National Park Service EIS's on personal watercraft use found that these craft cause no adverse or lasting impact. NOAA's EIS did not discuss the National Park Service's findings.

Response: There are 21 units in the national park system (generally national recreation areas or national sea/lakeshores) where the legislative purpose of the unit may permit use of MPWCs. In those units which have considered authorization of MPWC use, impacts were identified and requirements identified to mitigate the impacts to acceptable levels for those units. These findings were site-specific and generally included substantial limits on the operation of MPWCs.

However, the NPS, via regulation, has determined that MPWC use is generally inappropriate in units of the National Park system due to likely ecological or visitor impacts. Under NPS regulations finalized in 2000 and revised in March 2007 (36 CFR sec. 3.9(a)), Channel Islands National Park is closed to MPWC use.

MPWC – EXTEND BAN BEYOND 1 NMI OFFSHORE

204. Comment: NOAA should extend the prohibition beyond one nmi to include the entirety of CINMS waters (*i.e.*, six nmi from the Islands), consider prohibiting MPWC use in certain sensitive areas outside the one nmi limit, such as near emergent rocks or other resource-attracting features, or consider a temporal ban on MPWC outside of one nmi to protect pinnipeds and birds.

Response: NOAA is not extending the prohibition on MPWC beyond one nmi of the Islands (defined in the CINMS terms of designation as San Miguel Island, Santa Cruz Island, Santa Rosa Island, Anacapa Island, Santa Barbara Island, Richardson Rock, and Castle Rock) at this time, and believes that the one nmi ban provides the appropriate level of compatible use consistent with the protection of Sanctuary resources. The new prohibition on taking a marine mammal, sea turtle or seabird allows sufficient enforcement flexibility for activities occurring outside the one nmi MPWC ban area. Additionally, overlaying the existing CINP ban provides important benefits for cooperative enforcement. NOAA, in conjunction with the CDFG and other partners, will continue to monitor the use of MPWC within other areas of the Sanctuary. If this monitoring indicates adverse impacts to wildlife or other Sanctuary resources, NOAA could consider additional management actions as part of an adaptive approach to managing the Sanctuary. Any future regulatory actions taken by NOAA would be subject to the appropriate environmental analysis under the National Environmental Policy Act (NEPA) and public review and comment per the requirement of the Administrative Procedure Act.

MPWC – OTHER

205. Comment: NOAA is focusing too much on the semantics of the definition of a Motorized Personal Watercraft.

Response: As explained in the EIS, the CINMS regulations provide a definition of MPWC that is the same as that used by the NPS. This is important so that the CINMS regulation is consistent with the NPS ban on MPWC use in effect in the Channel Islands.

206. Comment: The process leading to the creation of the MPWC prohibition did not allow for public input, and/or NOAA should consult with more state officials, emissions experts, manufacturers, and actual users, before committing to such a ban.

Response: Per requirements of the National Marine Sanctuaries Act, the National Environmental Policy Act, and the Administrative Procedure Act, NOAA has followed federal requirements for notifying, and soliciting input from, the public, along with relevant state and federal agencies about the MPWC prohibition and all other actions that are part of the CINMS management plan review. Public input on the management plan has been extensive through the Sanctuary Advisory Council, public hearings, and the public comment period.

207. Comment: MPWC owners are cautious, use good judgment, and are considerate of the environment, and/or the demographics of MPWC owners have shifted to "a little older, more affluent and more responsible person."

Response: Despite the changes in MPWC user demographics described by the commenters, NOAA believes that the prohibition will assist CINMS in achieving its primary mandate of resource protection. Furthermore, the use of MPWC within one nmi of the Channel Islands has been prohibited by the NPS since 2000.

208. Comment: The plan does not mention that as of 2004 the California Air Resource Board (CARB) has prohibited the sale of two-stroke marine engines. There are no two-stroke engines being sold of any kind for marine use.

Response: NOAA is not aware of any CARB regulation banning the sale of two-stroke engines. CARB did restrict the type of two-stroke engine to only direct injection as of 2001. In addition there are many pre-2001 two-stroke powered MPWC in operation and there are no prohibitions on the use, replacement, or resale of the older carbureted or non-direct injected two-stroke engines in these craft.

209. Comment: NOAA should explain why it is prohibiting Personal Watercraft, when the agency seems to realize the benefits of these type of boats for emergency response and law enforcement.

Response: NOAA notes a distinction between recreational use and emergency response/enforcement. There is a tradeoff between potential environmental impacts and the benefit of emergency response and enforcement. The prohibition on MPWC use would not apply to 1) an activity necessary to respond to an emergency threatening life, property, or the environment; and 2) an activity necessary for valid law enforcement purposes in the Sanctuary. For a response to commenters who indicated that they opposed to the Sanctuary's MPWC regulation, see the response to comment 197.

210. Comment: NOAA should have reasonable boating regulations such as the generally applicable access restrictions, closures and boating rules set forth in existing Sanctuary regulations, and/or regulations that require an age limit, educational program, and a licensing system for MPWC use; or NOAA should establish best management practices to resolve problems with MPWC use.

Response: Given that the use of MPWC within one nmi of the Channel Islands has been prohibited by the NPS since 2000. NOAA is not considering the ideas suggested as an alternative to the prohibition on MPWC use in this zone. Regarding rider age limits and licensing systems, these are boating safety and registration issues more appropriately managed by State and Federal boat licensing agencies.

211. Comment: Based on the definition of personal watercraft in the DEIS, it appears that the intent of the MPWC prohibition is not to regulate fishing. If this is correct, the prohibition does not directly affect fishing, fishing vessels, fish stocks, or fish habitat.

Response: While the intent of this regulation is not to regulate fishing per se, it would prohibit the use of MPWC within one nmi of the islands, even if the MPWC were being used to conduct an otherwise lawful fishing activity.

212. Comment: NOAA should implement boater education programs to reduce MPWC accidents and injuries, which would render the ban on MPWC unnecessary.

Response: Education and safety regulations can increase MPWC safety. However, the intent of the one nmi prohibition is primarily to protect wildlife, and the existing NPS ban eliminates the utility of an educational program for MPWC operators in that zone. NOAA would consider partnering with another agency or organization for the purposes of developing educational programs to address MPWC use from one nmi to six nmi offshore in the sanctuary, should circumstances warrant it. NOAA welcomes input from the California Department of Boating and Waterways and the California Boating and Waterways Commission on education and outreach for MPWC users and all boaters regarding the Sanctuary.

213. Comment: NOAA should explain how the one mile limit for the MPWC prohibition was determined.

Response: NOAA believes that the one nmi limit is reasonable for preventing wildlife disturbance from MPWC in the sensitive nearshore area of the Sanctuary, especially considering the number of emergent rocks within the one nmi offshore zone of the islands. Additionally, this zone directly overlays the existing National Park Service ban on MPWC within Channel Islands National Park, facilitating cooperative enforcement of both the NPS and NOAA MPWC regulations.

214. Comment: The California Department of Boating and Waterways (CDBW) commented that they would be happy to help CINMS staff in delivering a message to the boaters that they come into contact with.

Response: NOAA looks forward to working with the CDBW on boater and MPWC education and outreach and has benefitted from partnering with the CDBW and others involved in the California Ocean Communicators Alliance "Thank You Ocean" campaign. The CDBW featured this campaign in an article in its April 2007 *Changing Tide* newsletter, including campaign advertisements and logos on the front and back cover of the issue. In recognition that 8,200 copies of this newsletter are circulated to marinas, yacht clubs, boat supply stores, boat repair facilities, other state agencies, clean boating network members, boat shows and events, NOAA greatly appreciates opportunities to partner with CDBW to conduct outreach to boaters. NOAA also appreciates the CDBW assistance with distribution of a CINMS boater safety brochure to registered boat owners throughout Ventura County, and looks forward to partnering on future boater outreach.

215. Comment: NOAA should keep the waterways open for responsible public use.

Response: NOAA's proposed action keeps the Sanctuary open for all public uses compatible with the CINMS's primary objective of resource protection, and not prohibited pursuant to other authorities.

MPWC – OTHER AGENCIES REGULATE BOATING

216. Comment: The CDBW was not consulted or asked to participate during the planning process. NOAA should have also consulted with the U.S. Coast Guard because they have the authority to promulgate regulations regarding recreational boats in federal waters.

Response: NOAA provided scoping and noticing of this action in accordance with NEPA, APA, and NMSA requirements. The U.S. Coast Guard and the California Resources Agency (the parent agency of the CDBW) each hold seats on the CINMS Sanctuary Advisory Council, and as such have been aware of and involved in this management plan development since its inception. In addition, prior to release of the DMP and DEIS, the NMSP's West Coast Region informed the California Boating and Waterways Commission of plans to consider an MPWC regulation at CINMS. NOAA remains open to working with the CDBW in the Channel Islands on topics of mutual interest in the future. Regarding consultation with the U.S. Coast Guard and enforcement, in addition to its involvement throughout the management plan review as an agency member of the Advisory Council, the USCG is also a Sanctuary cooperative enforcement partner. NOAA believes that the USCG is well suited to help enforce CINMS regulations, including the prohibition on MPWC, and as such CINMS coordinates enforcement with the USCG and other enforcement agencies.

217. Comment: The California Department of Boating and Waterways and the U.S. Coast Guard have the authority to regulate boating. Any federal regulations related to recreational boating (*i.e.*, MPWC use) proposed in the management plan should be adopted, if needed, by the U.S. Coast Guard, the federal agency with historical boating expertise and appropriate enforcement responsibilities.

Response: Although boating regulations could be developed by another agency, such as the USCG, NOAA thinks that in this case using Sanctuary authority would be the most efficient and logical means of achieving enhanced Sanctuary protection. Additionally, this regulation is an overlay of an existing National Park Service ban. NOAA works cooperatively with the NPS, USCG, and CDFG to enforce Sanctuary regulations, including regulations pertaining to recreational boaters that have been in effect for over twenty-five years. NOAA is interested in exploring opportunities for CDBW to assist with marine enforcement within the state waters portion of the Sanctuary.

MPWC – PENALTY

218. Comment: The maximum penalty of $130,000 for violation of the Sanctuary's MPWC prohibition is too high. Given this high fine, NOAA should mark the one nmi boundary with buoys and signs about the prohibition.

Response: The penalty of $130,000 is a maximum penalty for any violation as decided upon by Congress during the authorization and subsequent reauthorizations of the National Marine Sanctuaries Act. The actual penalties levied for NMSA violations vary in proportion to the severity of the incident and other case-specific factors. NOAA's Office of General Counsel for Enforcement and Litigation establishes a penalty schedule that outlines recommended penalties for violations under the NMSA. This penalty schedule provides notice to the public and provides guidance to the prosecutors as to a general range of penalties for specific violations. The penalty schedule reflects sanctions that NOAA believes will encourage compliance and deter violations; however, in every case, NOAA retains the ability to assess a penalty up to the statutory maximum of $130,000. The NMSA penalty schedule is publicly available and can be accessed through this link: http://www.gc.noaa.gov/schedules/58-NMSA%20Penalty%20Schedule%209-06.pdf.

It is the responsibility of Sanctuary users to know where they are within the Sanctuary, and what laws and regulations apply in a given area. CINMS education and outreach materials are designed to help users understand regulations. Physical signs can enhance awareness and compliance, but it is neither logistically nor financially feasible for NOAA to install a system of signs along the one nmi boundary warning of the MPWC ban.

MPWC – RELATION TO OTHER BOATS

219. Comment: The MPWC prohibition unfairly singles out and/or discriminates against MPWC, especially in terms of described environmental impacts, and/or access rights or regulations.

Response: NOAA has already established a precedent for regulating some users, such as large vessels and aircraft, differently than others in the one nmi offshore zone due to concerns about their potential impacts. NOAA acknowledges that MPWC are not alone in their potential for wildlife disturbance. However, scientific research and studies across the United States (*e.g.* California, New Jersey, Florida) have produced strong evidence that MPWC present a significant and unique disturbance to marine mammals and birds different from other watercraft. Though some other studies have found few differences between MPWC and small motor-powered boats, they have not presented evidence to invalidate the studies detecting significant impacts. In 1994, NOAA commissioned a review of recreational boating activity in the Monterey Bay NMS. The review provided statistics on MPWC use and operating patterns in the Sanctuary at the time and identified issues of debate from the research community regarding MPWC impacts on wildlife, but it made no formal conclusion or recommendation. At this time, NOAA has determined that the unique properties and operating characteristics of MPWC (which allow for high speed, repetitive nearshore operations, and are further described in the EIS) make them prone to present a significantly higher risk of wildlife disturbance than other vessel types. As such, NOAA thinks that MPWC are incompatible with resource protection within the one nmi offshore zone of the Sanctuary. Operation of MPWC in the CINMS is still allowed outside of the one nmi offshore area.

Regarding comments asserting that MPWC should be regulated in the same manner as other boats, NOAA believes that for other types of boaters, and for MPWC operating beyond the one nmi offshore zone, enforcement of the restrictions presented in Prohibition 9 (Taking a Marine Mammal, Sea Turtle or Seabird) provide for sufficient resource protection at this time. However, NOAA could in the future propose additional restrictions on other Sanctuary users, with public input and review, should protecting

Sanctuary resources warrant such action. With regard to MPWC rights to access, please note that the MPWC regulation would overlay an existing NPS ban on MPWC use within one nmi of the islands that has been in place since 2000. Neither the NPS nor CINMS regulations ban MPWCs for a six mile area surrounding the park. Rather, both ban MPWC use only in the one nmi offshore zone. Concerning emissions and water quality issues among MPWC and other boats, NOAA's objection to the operation of MPWC within one mile of the islands is due more to their potential for wildlife disturbance than concerns about emissions (see also the response to comment 201). In terms of whether or not there are differences in engine types between MPWC and other craft, the justification for the prohibition is not related to the engine type, but rather to the craft's unique capabilities and use patterns.

For information about NOAA's use of the best available information as it relates to the rationale for this prohibition, see response to comment 195.

MPWC – SUPPORT BAN

220. Comment: NOAA should prohibit the use of MPWC within one nmi from the islands, as proposed in the preferred alternative.

Response: NOAA is planning to implement the preferred alternative MPWC regulation.

NEARSHORE VESSEL APPROACH

221. Comment: NOAA should adopt the nearshore vessel approach prohibition in Alternative 1in order to: reduce the risk of grounding and collision accidents; to provide additional protection for sensitive near-shore areas; exclude a greater number of potentially harmful large vessels (those 150 GRT or more) than the Proposed Action (those 300 GRT or more); and reduce the likelihood of discharges and other impacts from relatively large vessels, including cruise ships. Additionally, NOAA should provide an exception allowing large vessels to operate in the shipping lanes.

Response: Like Alternative 1, the Proposed Action directly addresses the NOAA's concern that, with limited exceptions, large vessels should not approach and put at risk sensitive nearshore areas of the Sanctuary. NOAA is not aware of more than a few vessels between 150 to 299 GRT that occasionally visit the Sanctuary area within one nmi of the Islands. Using Automated Identification System (AIS) data, which will soon be available for the entire Sanctuary, NOAA plans to enhance vessel traffic monitoring in the nearshore area. If the number of vessels between 150 to 299 GRT increases significantly, and/or the incident of vessel accidents increases, NOAA can revisit this regulatory issue. Cruise ships are typically much larger than 300 GRT, and industry trends show increasing vessel sizes. The shipping lanes do not come within one nmi of Island shores, and thus an exception allowing large vessels to operate in the shipping lanes is not necessary.

222. Comment: NOAA should remove the fishing vessel exception to the nearshore vessel approach regulation under both the Proposed Action and Alternative 1. Additionally, NOAA should assess the costs and benefits of removing the exception for fishing vessels of these sizes, including the regulatory burden of gaining a permit for such activity, and the rationale for the exception.

Response: NOAA is not removing the nearshore vessel approach regulation's exception for fishing vessels at this time. NOAA is not aware of fishing vessels greater than 150 GRT using Sanctuary waters, including within one nmi of the Islands, nor aware of any emerging fisheries trends suggesting that vessels of this size are planning to use Sanctuary waters. Using AIS data, which will soon be available for the entire Sanctuary, NOAA will enhance vessel monitoring in the nearshore area. NOAA also

monitors vessel use of the Sanctuary via aerial surveys. Should fishing vessels 150 GRT begin to use the Sanctuary, NOAA can revisit the associated risks and determine how to address them.

NOAA does not believe that the requirements for obtaining a permit are burdensome. Sanctuary staff regularly process a variety of permits and work to maintain an efficient and streamlined process. Furthermore, few vessels that routinely visit the Channel Islands nearshore area are 300 GRT or more.

223. Comment: Support is expressed for the Proposed Action alternative's modification of the nearshore vessel approach regulation to prevent large (300 GRT or more) non-fishing vessels from traveling within one nmi of island shores in the Sanctuary.

Response: Comment noted.

224. Comment: NOAA should not limit the large vessel nearshore approach prohibition to one nautical mile from island shores, but instead should expand it to the Sanctuary's outer boundary.

Response: The International Maritime Organization has already designated the majority of the Sanctuary, excluding the portion that overlaps the TSS, as an Area To Be Avoided (ATBA). NOAA seldom observes large vessels within the ATBA, and as such NOAA has not deemed it necessary at this time to prohibit large vessel use beyond one nmi from the Islands.

225. Comment: NOAA should completely ban cruise ships inside the Sanctuary's six nautical mile boundary because of poor dumping practices.

Response: CINMS regulations would prohibit cruise ships 300 GRT or more (cruise ships are typically much larger than 300 GRT) from approaching within one nmi of the Islands, and prohibit them from discharging sewage and graywater in the Sanctuary. Based upon the best available information, NOAA has determined that it is not necessary to ban cruise ships within the entire Sanctuary at this time.

OIL AND GAS

226. Comment: NOAA should continue to prohibit any oil and gas development within the Sanctuary given the short- and long-term human and environmental impacts from oil spills, and the relatively high probability that they will occur. NOAA should also take necessary measures to protect Sanctuary resources from oil development in the surrounding region.

Response: NOAA is maintaining the prohibition on exploring for, developing, or producing hydrocarbons within the Sanctuary. NOAA also comments on oil and gas related projects in the region that have the potential to affect Sanctuary resources.

227. Comment: Commenter supports the Proposed Action Alternative's prohibition 1 on oil and gas that maintains current prohibitions on oil and gas development while removing outdated exemptions.

Response: Comment noted.

PERFORMANCE EVALUATION

228. Comment: The Conservation Science Action Plan's performance measures should include not only funding levels and quantitative measures of monitoring and research efforts, but metrics of a given activity's completeness, efficiency and quality.

Response: The FMP's Performance Evaluation Action Plan contains performance targets for all eight of the Conservation Science Action Plan's strategies, all of which address at least one of the criteria identified by the commenter (completeness, efficiency, and quality). As CINMS staff implement the management plan, these targets may be updated or modified to more clearly articulate these criteria, and to more closely align the specific CINMS performance targets with those identified for the national program (there are currently 21 program performance measures for the NMSP).

229. Comment: Requirements for specific quantitative performance measures may impede CINMS's ability to implement programmatic and regulatory improvements that may have more qualitative benefits.

Response: CINMS staff have developed both quantitative and qualitative performance targets for the strategies in each of the FMP's action plans. Quantitative performance targets are typically used to track outputs (or products), but may also be used to identify certain qualitative achievements (such as the percentage of increased knowledge within a particular user group). Performance targets are developed in response to, rather than as an impetus for, identification of a management activity. In other words, sanctuary-specific performance targets do not "drive" the development of management activities; rather, they are the means by which a sanctuary tracks it progress towards the achievement of sanctuary-specific and NMSP goals and objectives. As such, NOAA does not believe that quantitative performance targets will impede development of any regulatory or non-regulatory management actions that may have qualitative benefits for CINMS.

230. Comment: The management plan should include a baseline water quality characterization, and its Performance Evaluation Action Plan should include a performance metric that actually measures whether Sanctuary water quality is being improved via physical measurements of pollution levels and environmental health.

Response: Strategy WQ.2 includes an activity to complete a CINMS water quality characterization report. Regarding water quality performance metrics, since revision of the CINMS management plan began, the NMSP has developed a set of program level performance measures that set management targets for the sanctuary system. One of these targets is the "Number of sites in which water quality, based on long-term monitoring data, is being maintained or improved." Criteria for measuring this target have been developed through the NMSP's conservation science program, and a tracking plan for how each sanctuary will meet these criteria has been implemented across the system. CINMS staff are currently working to provide Sanctuary-specific data on these criteria, which will eventually be included in a system-wide report on the status of NMSP performance targets.

231. Comment: Sanctuary goals are lacking an MOU for procedural review of the protection at CINMS that defines data gaps, survey design and data streams connected to budgets that facilitate management decisions. CINMS has no functional management culture that can assess the status of the resources to use as a foundation for working with the fishing community. It is not bound by any peer review protocol or data management performance criteria.

Response: The FMP's Conservation Science Action Plan identifies the myriad ways in which NOAA and its partners have collected, and continue to collect, assess, and apply, information on the status of CINMS resources. Although no general MOU exists between CINMS and its partners on research in the Sanctuary, there are a variety of MOUs planned or in place for specific research and management activities (such as implementation of the marine reserves). In addition, MOUs are often not needed for collaboration on management and monitoring of marine resources with many agencies and organizations—for example, CINMS collaborates extensively with NOAA Fisheries, and existing statutes allow for extensive coordination with the Pacific Fishery Management Council. Identifying data gaps and

survey design are an inherent part of nearly all CINMS research initiatives and decisions to implement any research project are always linked to budgetary considerations. With regard to performance criteria, see the response to comment 230 for an example of how the NMSP is moving forward on this issue.

PERMITS

232. Comment: NOAA has recently dramatically improved the scientific research permitting process. The process is straightforward and reasonably quick, much improved over the past.

Response: Comment noted.

233. Comment: NOAA should provide transparency for the CINMS permit process, including provisions for public notice, review and comment on issuance and monitoring of Sanctuary permits.

Response: NOAA does not currently envision a public notification and review provision for all CINMS permits. Existing NMSP regulations (15 CFR 922.48) identify the permit issuance criteria for all national marine sanctuaries, which provide a rigorous set of parameters under which NOAA can permit an activity that is otherwise prohibited. It should be noted that when receiving a permit application, the CINMS Superintendent may request additional information from the applicant and, if appropriate, may hold a public hearing to obtain more information. If a permit holder acts in violation of the terms and conditions of any permit, NOAA may amend, suspend, or revoke the permit. Projects that would result in the preparation of an environmental impact statement under the National Environmental Policy Act would be subject to public review and comment.

234. Comment: If a permit applicant will be using vessels for hire or soliciting related assistance for his/her proposed project, NOAA should require the applicants to use appropriately licensed vessels and operators.

Response: Individuals or entities conducting activities under a CINMS permit must still comply with all federal, state and local laws and regulations that are applicable to that activity.

235. Comment: In the FMP NOAA should provide an explanation or examples of what types of research would and would not require a permit.

Response: NOAA has updated FMP Strategy OP.2 (Permitting and Activity Tracking) with examples of the types of research and other activities that do and do not require a Sanctuary permit.

RESEARCH AND MONITORING

236. Comment: The Channel Islands National Marine Sanctuary has an admirable scientific research program, primarily in partnership with colleges and universities in the area. This scientific research should be continued and expanded to increase understanding of the unique ecosystem of the Santa Barbara Channel and Channel Islands.

Response: CINMS research staff continue to look for opportunities to build partnerships and collaborate on research. Through research outreach efforts, such as presentations at conferences and workshops, publication of scientific papers, and distribution of reports, staff inform the research community of our efforts and needs. CINMS staff also solicit research projects in the Sanctuary through our request-for-vessel process while continuing to identify funding opportunities through grants and partnerships.

237. Comment: The management plan properly identifies the importance of data management and dissemination to the overall effectiveness of the Conservation Science Action Plan. It also addresses the highly collaborative and partnership-based nature of the biological research process and the need for extensive collaboration with partners at other agencies and entities.

Response: Comment noted.

238. Comment: NOAA should find additional funding for monitoring programs so that the scientific community does not lose its integrity by not being able to fulfill monitoring requirements. The funding amount for Conservation Science Action Plan should be increased at least two-fold, to match the level of funding dedicated to Education and Outreach. NOAA should also fund structural support for the cooperative research program.

Response: NOAA recognizes that resource limitations as well as the necessary program and partner developments may limit implementation of all of the activities in the management plan, including the Conservation Science Action Plan. NOAA will continue to work with the Department of Commerce, Office of Management and Budget, and Congress in developing supporting justifications when preparing budget submissions. Sanctuary staff will continue to look for opportunities for funding through other federal programs, private grants, and partnerships with agencies, universities, and private and non-profit organizations. NOAA supports the cooperative research program and will fund it as the CINMS budget allows, including through the funding opportunities listed above.

Estimated costs shown for the Conservation Science Action Plan and the Public Awareness and Understanding Action Plan are not directly comparable. The Conservation Science Action Plan budget does not include contributions from partners and collaborators, nor does it include the large amount of funding to staff and operate vessels, which is estimated in the FMP's Operations Action Plan. In addition to these contributions, NOAA continues to seek additional funding opportunities as listed above. NOAA has also revised some of the cost estimates for Conservation Science Action Plan strategies.

239. Comment: NOAA should prioritize science relevant to management and apply it to existing and emerging resource protection issues. The Conservation Science Action Plan should include an explicit goal for the application of scientific research to the understanding and mitigation of identified or emerging threats. NOAA should consider how it can best orient its scientific research programs to better translate research results to management decisions.

Response: NOAA recognizes that sanctuaries should ensure that their research and monitoring programs are effectively prioritized to produce scientific information that can be applied to the understanding, mitigation, and management of identified or emerging threats. Through the NMSP's System-Wide Monitoring Program (SWiM) reports, CINMS staff will provide status updates on the condition of Sanctuary resources to local, regional, and national policy makers. The NMSP holds an annual research coordinators' meeting at which research staff discuss research issues and needs across the program. The ONMS West Coast Region coordinates research and monitoring efforts within the region to address regional management and resource protection issues.

The purpose of the research department at CINMS is to support management decision making with conservation science. NOAA has emphasized this point in the FMP's revised Overview to the Conservation Science Action Plan. CINMS research staff regularly collaborate with partners, including other federal and state agencies, universities, private institutions, and non-profit agencies. The Research Activities Panel, a working group of the Sanctuary Advisory Council, provides oversight to the monitoring programs in the Sanctuary. The status of monitoring programs is reported to regional and national offices through internal documents.

240. Comment: Overall research/science coordination and data management are important, necessary, and the greatest conservation science needs within the Sanctuary.

Response: CINMS research staff coordinate conservation science by being in close contact with researchers, tracking and requiring updates on their research activities, and working with joint-jurisdiction agencies. Staff also develop research partnerships to address research gaps, and receive input from the RAP on research and monitoring activities.

CINMS staff continue to strive towards better research coordination and comprehensive data management as funding and staffing allows.

241. Comment: Sanctuary Aerial Monitoring Spatial Analysis Program (SAMSAP) graphical data must be included in the online database architecture proposed in DMP Strategy CS.2, and become publicly available.

Response: SAMSAP data have been, and continue to be, analyzed and used in a wide variety of spatial and statistical projects ranging from marine zoning to emergency response applications. The majority of SAMSAP data are already in a format easily importable into a variety of common database formats. As noted in the revised Strategy CS.2, rather than developing a new online database, CINMS will work with regional partners already running established web-based data warehouses to identify the most appropriate data warehouses to best disseminate particular data types. The end result will make SAMSAP data available and integrated with the publicly-accessible Sanctuary Integrated Monitoring Network (SIMoN, www.sanctuarysimon.org) that will be expanded to CINMS.

242. Comment: Many existing programs (*e.g.*, SAMSAP) could be used to meet a greater variety of research needs. The CINMS Research Coordinator should take an active role in expanding or redirecting internal CINMS research activity and make strategic decisions about the allocation of Sanctuary support among existing external research programs.

Response: CINMS research staff use the Management Plan and other annual research prioritization documents to set priorities and direct and fund CINMS research activities. In recent years SAMSAP data have been analyzed and are now being used, among other things, in socioeconomic impact studies related to marine zoning.

243. Comment: The Conservation Science Action Plan's Comprehensive Data Management strategy does not include enough analysis and synthesis to help formulate a general research plan. Data management must be more than a simple means to provide information to the public and others; it should reveal important gaps and trends, and can be used strategically to guide future research and to answer specific questions mandated by reviewing agencies.

Response: Data management can be used strategically to guide future research and to answer specific questions. The FMP's comprehensive data management strategy is focused on integrating CINMS data into existing regional and national data management programs to facilitate enhanced conservation science-based decision-making. While this strategy focuses on data management, inherent in the Resource Protection Action Plan is a need to analyze data. Complementing the data management strategy, the FMP's Resource Protection Action Plan identifies a variety of current and emerging resource protection issues and it is expected that for each issue a number of science-based questions may emerge. Answers to these questions will guide and drive data analysis activities and research planning in a manner consistent with the comment. Thus, data analysis and synthesis occur as part of management plan implementation, and are also manifested in Sanctuary annual operating plans, as well as through annual research vessel allocation decisions.

244. Comment: Strategy CS.2 (Comprehensive Data Management) should be elevated to a high level of planned implementation as shown in the management plan's Appendix A1. If CINMS could serve as a clearinghouse for data, such as through the Sanctuary Integrated Monitoring Network (SIMoN), interested researchers would be able to assist the Sanctuary even in the absence of a comprehensive research and monitoring plan.

Response: NOAA has elevated the planned implementation level of activities within Strategy CS.2 to high. See revised Strategy CS.2 for updated information on how CINMS staff plans to use existing data management tools, like SIMoN.

245. Comment: Support expressed for the Collaborative Marine Research Program as a highly innovative effort to bring potential resources, knowledge and cost savings to bear on the process of biological marine research and monitoring. The Collaborative Marine Research Program is also: uniquely capable of monitoring species not easily detected by traditional monitoring techniques; an excellent example of applying limited Sanctuary resources to known gaps and limitations that should be routinely assessed; an important outreach and research program.

Response: The Collaborative Marine Research Project is a valuable program. NOAA will continue to support this program as funding allows. For additional information about funding see the response to comment 238.

246. Comment: Support expressed for development of collaborative research programs coupled with socioeconomic monitoring programs, and as part of an integrated research plan, rather than developing in isolation.

Response: Collaborative marine research projects need to be integrated into the overall research and monitoring plan. As noted in the background of Strategy CS.4, efforts will be made to ensure that collaborative marine research does not duplicate existing research efforts, but rather complements them by filling research gaps and building new knowledge to assist resource managers. NOAA believes that the Sanctuary Advisory Council's Research Activities Panel (RAP) is a key player in providing Sanctuary management with advice to help ensure that research programs are integrated.

247. Comment: NOAA should donate R/V *Shearwater* vessel time to support the National Audubon Society's Christmas Bird Count.

Response: Written proposals must be submitted in order for NOAA to consider any vessel undertaking. NOAA will assign priority to those proposals that take place within Sanctuary boundaries and address various management plan priorities. See the response to comment 249 for additional information about the vessel allocation process.

248. Comment: The support of the R/V *Shearwater* to the local research community has been invaluable and CINMS should continue this support.

Response: The R/V *Shearwater* will continue to support those efforts that address various FMP action plan strategies, to the greatest extent allowable given financial and logistical constraints inherent to field operations.

249. Comment: Regarding the management plan's Operations Action Plan, the process by which CINMS research vessel time is allocated remains obscure, and research operations would benefit from an open and transparent set of rules by which allocation decisions are reached.

Response: NOAA has revised text in the FMP's Operations Action Plan, Strategy OP.4 to include clarification of the annual sea-day allocation and scheduling processes that occur each autumn.

250. Comment: NOAA should include a plan for deepwater site characterization and deepwater MPA monitoring in Strategy CS.3 – Support Existing Site Characterization and Monitoring Programs.

Response: NOAA has updated text in Strategy CS. 3 of the FMP to include an activity on deep water monitoring for the CINMS MPA network.

251. Comment: SAMSAP surveys should be expanded (provided increased funding). There is an unmet need to quantify fishing pressure in and around Sanctuary waters. Additionally, SAMSAP surveys would benefit from review by statisticians to optimize their design and usefulness.

Response: NOAA is actively working to increase SAMSAP funding at CINMS. Reduced availability of NOAA aircraft requires CINMS staff to seek alternative aircraft options, such as contract aircraft, which cost much more to fund than NOAA aircraft, and partner agency aircraft. CINMS has been working with socioeconomic statisticians and economists since 2007 to analyze and improve SAMSAP survey methodology and analysis.

252. Comment: NOAA should continue supporting seafloor mapping within the Sanctuary, which has uses for education and outreach, research and monitoring, and historical resources (finding shipwrecks).

Response: Comment noted.

253. Comment: Existing ongoing research activities in the CINMS are described in varying amounts of detail in the Conservation Science Action Plan; many are mentioned in passing or not mentioned at all.

Response: NOAA describes projects in varying amounts of detail and has elected not to describe every research project in great detail. There are some small, short-term projects (for example, graduate student work, or projects that may last three years or less), that while important, NOAA concluded did not warrant detailed descriptions in the plan. Programs that fall within Sanctuary priorities, but are not described, are not necessarily precluded from Sanctuary support. Likewise, the Sanctuary remains open to supporting new projects that may emerge.

254. Comment: The management plan's Conservation Science Action Plan information on marine reserves monitoring does not mention the large acoustic receiver array maintained by the Pfleger Institute of Environmental Research (PIER). PIER's monitoring of fish movement relative to the reserve boundaries is one of very few projects that are specifically designed to investigate questions of reserve efficacy.

Response: NOAA acknowledges important contributions the PIER project has brought to marine reserves research. Although this project ended in 2006, Sanctuary staff look forward to the analysis of existing data and are interested in seeing this project or similar acoustic tagging projects return, should funding allow. As mentioned in the Conservation Science Action Plan at CS.6, specific marine reserves biological monitoring programs are described in the *Channel Islands Marine Protected Area Monitoring Plan*, a multi-agency document developed by the California Department of Fish and Game (California Resources Agency, CDFG 2004).

255. Comment: The CINMS Conservation Science Action Plan should do more than simply track external programs. Importantly, as programs grow and research activity intensifies, a policy of generally supporting all existing programs will not suffice.

Response: The Conservation Science Action Plan is not limited to tracking external programs. The Sanctuary is directly involved in a number of research programs (*e.g.*, SAMSAP, and seabird monitoring), explained in the Conservation Science Action Plan, and for which the Sanctuary provides support in the form of staff, vessel time, and/or funding. NOAA does not have a policy of "supporting all existing programs" at the CINMS. There are limits to the amount of support the Sanctuary can provide, and NOAA uses a strategic approach to planning Sanctuary research and monitoring, allocating resources in accordance with Sanctuary research priorities that are determined on an annual basis.

256. Comment: The Conservation Science Action Plan's performance evaluation criteria are not satisfactory, including the performance targets for the marine reserves monitoring strategy (CS.6). By specifying very narrow performance targets without an integrated research plan, CINMS staff effort is focused too quickly on small steps. NOAA should identify: 1) what the Sanctuary specifically wants to monitor, 2) what the targets for management are, and 3) whether those targets are being met.

Response: NOAA acknowledges that the Conservation Science Action Plan's performance evaluation criteria, while tangible and able to be quantifiably tracked, are not alone fully informative for overall management effectiveness. NOAA understands that a variety of assessment methods will be needed to ensure that the Conservation Science Action Plan is effective. Additional specific performance measures have been developed and are listed in the Description of the Issues section of the Performance Evaluation Action Plan within the FMP. These performance measures establish targets for understanding the status and trends of Sanctuary water quality, habitats and living marine resources, and will help guide prioritization and implementation of strategies and activities within the Conservation Science Action Plan. NOAA will work with the Research Activities Panel and other partners to refine assessment methods during management plan implementation, and will refine these methods over time.

257. Comment: CINMS staff should partner with ongoing research and coordination efforts via California Sea Grant, the Southern California Coastal Ocean Observing System **(**SCCOOS), and the California North Coast Ocean Observing System (CNCOOS).

Response: The NMSP's West Coast Region has been the lead on coordinating ocean observing systems within west coast national marine sanctuaries. With its support, CINMS staff continue to work with the Partnership for Interdisciplinary Studies of Coastal Oceans (PISCO) to help fund their oceanographic buoys.

258. Comment: NOAA should initiate an ecosystem based co-management seat on the research activities panel.

Response: As is the case with all Sanctuary Advisory Council working groups, the Research Activities Panel decides upon its membership, and does not at this time have seats dedicated to specific ideologies or user groups. NOAA recommends that the commenter make this general suggestion directly to the Research Activities Panel.

259. Comment: Success of the Comprehensive Data Management strategy will rely heavily on identifying a highly capable CINMS Research Coordinator.

Response: In 2007, NOAA hired Dr. Steve Katz as the Sanctuary's new Research Coordinator.

260. Comment: NOAA should initiate research on the impacts of increasing CO2 and ocean acidification on Sanctuary resources.

Response: CINMS staff and the Sanctuary Advisory Council have begun to examine increasing CO2, ocean acidification, and related climate change issues. For example, CINMS staff and the Sanctuary Advisory Council are collaborating on a carbon budget and greening project that aims to raise awareness and understanding of the Sanctuary's carbon cycle and carbon inputs from human activity in the Sanctuary and surrounding environment. The NMSP is working with the NOAA Climate Office to pursue funding for detecting climate change impacts in each national marine sanctuary, including the Channel Islands. With regard to ocean acidification and its potential effects on Sanctuary resources, the Advisory Council's Conservation and Commercial Fishing working groups are collaborating on development of a comprehensive report on ocean acidification, and related recommendations for the Sanctuary and NMSP. (See also new information added to the FMP's Resource Protection Action Plan). The results of this work are anticipated in 2008, and will include review and comments from the Advisory Council and its Research Activities Panel.

261. Comment: Commenter concurred with the comments offered by the Research Activities Panel.

Response: Please refer to responses to the Research Activities Panel's comments, listed in the table at the beginning of this appendix under "Warner, Robert."

RESOURCE PROTECTION

262. Comment: NOAA should develop a Resource Protection Action Plan within the management plan, to incorporate but go beyond the Emerging Issues Action Plan. A resource protection action plan should: link resource protection issues with management responses; require funding for staff time dedicated to issue-response measures; and articulate that CINMS may play a leadership role in, rather than relying excessively on other parties for, scientific and resource protection efforts. Resource protection issues could include: LNG, aquaculture, sea otter migration, artificial lighting (*e.g.* from squid boats), ship strikes, introduced and invasive species, artificial reefs, plumes of non-point source pollution from mainland rivers during storm events, and atmospheric deposition of air pollutants into Sanctuary waters.

Response: NOAA has revised several strategies and background information from the DMP to develop a new Resource Protection Action Plan in the FMP. This action plan articulates how NOAA addresses existing CINMS resource protection issues, as well as how emerging issues will be addressed. Each of the issues suggested as resource protection issues are noted in either the FMP's Resource Protection or Water Quality action plans. NOAA has explained the various steps it may take in responding to Sanctuary resource protection issues within Strategy RP.2 ("Responding to Identified Issues"). Due to the complexity and evolving nature of resource protection issues, NOAA maintains that it would be inappropriate to link specific "triggers" with specific "responses" in advance. The CINMS Resource Protection Coordinator and Sanctuary Advisory Council Coordinator are primarily responsible for implementing the activities in this action plan (with assistance from other staff). As permanent, full-time positions, each is allocated specific funding. NOAA also leverages and maximizes resources available through collaborative partnerships.

263. Comment: NOAA should take additional, or in some cases, immediate management measures to address critical resource management issues including: underwater noise, aquaculture, artificial reefs, oil and gas development, wildlife protection, fisheries management, global warming and liquefied natural gas proposals. NOAA should establish a specific process to address these CINMS issues as part of the management plan review.

Response: The CINMS staff work closely with fishery management agencies (NOAA Fisheries and the California Department of Fish and Game) to address Sanctuary concerns about fisheries impacts. The Sanctuary has expanded its discussion of wildlife protection, oil and gas development, and global

warming in the FMP's Resource Protection Action Plan, which also discusses aquaculture and artificial reefs. This action plan describes a process for addressing resource protection issues. Threats from oil and gas development, and activities to address them, are discussed in the FMP's Emergency Response and Enforcement Action Plan, as well as the Water Quality Action Plan (which outlines a process for developing a comprehensive Water Quality Management Program to address all Sanctuary water quality issues).

264. Comment: NOAA should consider placing permanent moorings at popular island anchorages to prevent seafloor damage and protect resources from boaters who possess poor anchoring skills.

Response: NOAA has supported and permitted the installation and maintenance of permanent moorings at Santa Rosa, Santa Cruz and Anacapa islands anchorages, which are used by the NPS and its concessionaire vessels. The Sanctuary Advisory Council has discussed, and NOAA has considered the possible need for and appropriateness of additional moorings; however, at this time, NOAA has not reached a decision on this issue as it is still gathering information. NOAA will continue discussing this with the NPS, the Sanctuary Advisory Council and others. NOAA will use the activities in the Resource Protection Action Plan to track, assess, and determine how to address seafloor damage from anchoring.

SANCTUARY ADVISORY COUNCIL INVOLVEMENT

265. Comment: NOAA's federalism assessment statement within the proposed rule improperly and inaccurately suggested that the current Sanctuary Advisory Council supports the regulatory action.

Response: NOAA's intent was to provide information explaining that NOAA has consulted with various entities, including the Sanctuary Advisory Council, throughout the development of the regulatory action. The Sanctuary Advisory Council was very closely involved from 1999 through 2002, at which point the proposed regulatory action entered NOAA's internal review process. NOAA acknowledges that individuals who joined the Advisory Council since 2002 were not as closely involved in the development of the proposed regulatory action, and as such NOAA has revised the statement accordingly.

SEA OTTERS

266. Comment: The FMP and FEIS should discuss the connection between water quality, sea otter health, nearshore marine ecosystem health, and human health.

Response: Text in FEIS Appendix C now includes discussion about research on the connection between these concerns.

267. Comment: In the FEIS, NOAA should acknowledge and support the reality of future sea otter migration into Sanctuary habitats and not identify this as a potential 'issue,' 'conflict,' or 'problem' to be dealt with. Also, it should be acknowledged in the FEIS that NOAA has taken a position on the expanding range of the sea otter by commenting in support of Alternative 3C in the US Fish and Wildlife Service (2006) DSEIS.

Response: NOAA does consider future sea otter migration into Sanctuary habitats as an "issue" to be addressed. NOAA has not equated issues with problems, but rather issues constitute the range of topics that must be addressed by Sanctuary actions. Because sea otters have not been present in significant numbers within the Sanctuary since its designation, the expansion of their current range to include the Sanctuary is a change in Sanctuary conditions. NOAA believes that this change would warrant Sanctuary attention and may potentially warrant future actions by Sanctuary staff (*e.g.*, in the Resource Protection, Research, and Education programs). NOAA has updated and augmented information on this issue in the

FMP's Resource Protection Action Plan, Description of the Issues, under the sub-header *Termination of the Sea Otter Translocation Program*. The NMSP has taken a position on the expansion of the sea otter range in southern California, and this is a matter of public record.

268. Comment: The documents should not use the phrase "possible future sea otter migration into Sanctuary habitats," since sea otters are currently found within the Sanctuary, albeit not in large numbers (both at San Nicolas Island and in other parts of the Sanctuary) or necessarily as permanent residents. However, at some unknown time, sea otters will probably reoccupy this historic habitat as permanent residents again.

Response: NOAA has updated the management plan text in the FMP's Resource Protection Action Plan with information about the status of sea otters in the Sanctuary and surrounding region, using information from the USFWS 2005 Draft Supplemental Environmental Impact Statement on translocation of southern sea otters. San Nicolas Island is one of the Channel Islands, but is not part of the Sanctuary.

269. Comment: NOAA should consult with researchers at USGS (Brian Hatfield) and FWS (Lilian Carswell) to revise the mention of "rare sightings" of sea otters in the FEIS.

Response: NOAA has revised text in the FEIS based on the USFWS (2005) Draft Supplemental Environmental Impact Statement, which includes current information on the presence of sea otters in Sanctuary waters and the study area. Based on USFWS (2005) information on the abundance and distribution of California sea otters, sea otters are not expected to have any effect on CINMS resources within 10 years, and while there are rare sightings, they have yet to recolonize the CINMS.

SUBMERGED LANDS DISTURBANCE

270. Comment: Commenters indicated their support for the proposed modification of the prohibition on altering submerged lands of the Sanctuary, which extends this protection of the seabed to the entire Sanctuary.

Response: Comment noted.

271. Comment: If bottom trawling occurs in a sanctuary, it should not be called a sanctuary.

Response: The purposes and policies of the NMSA provide for facilitating public and private use of national marine sanctuaries compatible with their primary goal of resource protection. Pursuant to existing federal and state regulations, bottom trawling is highly restricted in existing Sanctuary waters. It is prohibited inside one nmi of the islands, throughout the network of ten marine reserves and two conservation areas, and in several fisheries.

TAKE AND POSSESSION OF MARINE MAMMALS, SEA TURTLES AND SEABIRDS

272. Comment: Support expressed for prohibitions 9 and 10 (taking and possessing, respectively, any marine mammal, sea turtle, or seabird), but recommend that the regulation include or reference language specifically stating that commercial fishing or certain research activities which may involve the occasional take of these species may lawfully operate as such under authorizations granted pursuant to the Marine Mammal Protection Act, Endangered Species Act, or Migratory Bird Treaty Act.

Response: NOAA has not added the specifically requested language to these regulations. These prohibitions already include an exception for authorizations granted by the Marine Mammal Protection

Act, Endangered Species Act, or Migratory Bird Treaty Act. As the DEIS (sections 2.1.10 and 2.1.11, 4.1.9 and 4.1.10) explained, the Sanctuary's proposed regulation would not apply if an activity (including a federally or state-approved fishery) that does or might cause take of marine mammals, seabirds or sea turtles has been authorized to do so under the MMPA, ESA, or MBTA or any implementing regulation promulgated under these acts. NOAA believes it has clearly described and helped the reader understand the nature, extent, applicability and intent of the exception to prohibitions 9 and 10.

273. Comment: Sanctuary prohibitions 9 and 10 (taking and possessing, respectively, any marine mammal, sea turtle, or seabird), are duplicative of existing regulations, unnecessary, confusing as to whether the intent is to track other laws, and could unnecessarily prohibit certain fisheries in the Sanctuary. NOAA should add language specifically acknowledging take exemptions found in other existing authorities, including PFMC Fishery Management Plans.

Response: NOAA has carefully crafted these regulations to be complementary in nature, with an area-specific focus on marine mammals, sea turtles, and seabirds in the Sanctuary, and to provide a different suite of penalties than available under other regulatory agencies' authority. The regulations as written acknowledge take and possession exemptions found in the Marine Mammal Protection Act (MMPA), Endangered Species Act (ESA), Migratory Bird Treaty Act (MBTA) or any regulation promulgated under the MMPA, ESA, or MBTA. NOAA understands that lawful fishing operations that are likely to take a marine mammal, sea turtle, or seabird are typically provided with exemptions for such take, and therefore would be excepted from this Sanctuary regulation. NOAA believes that the NMSA civil penalty schedule provides a valuable deterrent to illegal take and possession of these species. In addition, this regulation is consistent with those in place at the Monterey Bay, Stellwagen Bank, Olympic Coast, and Florida Keys national marine sanctuaries.

274. Comment: Concern expressed about the Sanctuary's prohibition on take of marine mammals, sea turtles, and seabirds, as it might apply to unintentional hooking of these animals while lawfully fishing. The regulation would impede a fisherman's ability to release, remove, unhook, or untangle any marine mammal that is inadvertently caught or snagged during lawful fishing operations in the CINMS. NOAA should revise the regulation to provide an exception for unintentional hooking. NOAA should also consider if USFWS and CDFG regulations have such an exception.

Response: NOAA understands that lawful fishing operations that are likely to take a marine mammal, sea turtle, or seabird are typically provided with exemptions for such take, and therefore would be excepted from this regulation.

275. Comment: NOAA should improve NMSP enforcement of the Marine Mammal Protection Act with respect to emissions of underwater noise, especially now that NOAA is proposing to add a CINMS prohibition on marine mammal 'take' within Sanctuary boundaries.

Response: The NMSP does not have enforcement authority with regard to the Marine Mammal Protection Act. Should NOAA conclude that unauthorized take has occurred within the Sanctuary, NOAA would ensure that appropriate enforcement actions are taken by NOAA's Office for Law Enforcement, the branch of NOAA charged with enforcing both the NMSA and MMPA.

276. Comment: Why is NOAA only now proposing a regulation to prohibit take of a turtle or marine mammal, when that is one of the basic protections that people expect.

Response: Take of these species has always been prohibited in the Sanctuary, and in U.S. waters in general, under the protections afforded by the Marine Mammal Protection Act, and the Endangered

Species Act. At this time NOAA has determined that overlaying these regulations with Sanctuary regulations is warranted to provide an added civil penalty deterrent against such already illegal take.

VESSEL TRAFFIC

277. Comment: NOAA should explain why CINMS Designation Document Article IV indicates that operating a vessel (*i.e.*, watercraft of any description) within the Sanctuary is subject to regulation, including prohibition. At an Advisory Council meeting CINMS staff discussed regulation of MPWCs, but this language makes it possible for the Sanctuary to prohibit all vessels and NOAA should remove it.

Response: NOAA is not removing this language because since its inception, CINMS has had general authority to regulate the navigation of vessels. To date, NOAA has utilized this authority to regulate the operation of cargo vessels and vessels servicing offshore installations within one nmi of the Islands, and now, to regulate motorized personal watercraft within that same area. While a given activity may be within the Sanctuary's scope of regulations, any new Sanctuary action (including regulation) that could significantly affect the environment (including the human environment), would be subject to legal requirements under the National Environmental Policy Act, and Administrative Procedure Act, which ensure an open public review process regardless of the scope of regulations within the CINMS terms of designation.

278. Comment: NOAA should prohibit cruise ships and industrial activities such as LNG and associated traffic within the entire Sanctuary to protect the Sanctuary from noise impacts and discharges.

Response: At this time, NOAA's primary concerns with cruise ships pertain to nearshore approach and waste discharge/deposit in the Sanctuary. The new CINMS regulations would prohibit cruise ships 300 GRT or more (cruise ships are typically much larger than 300 GRT, and industry trends show increasing vessel sizes) from approaching within one nmi of the Islands, and prohibit them from discharging sewage and graywater anywhere in the Sanctuary. Based upon the best available information, NOAA has determined that it is not necessary to ban cruise ships within the entire Sanctuary at this time.

The Sanctuary is already protected from industrial activities through regulations protecting the seabed and water quality, and a prohibition on hydrocarbon activities. The proposed regulation changes would add a prohibition on mineral activities. The International Maritime Organization designated the majority of the Sanctuary, excluding the portion that overlaps the Traffic Separation Scheme, as an Area To Be Avoided (ATBA). NOAA seldom observes large vessels within the ATBA, and as such has not deemed it necessary at this time to prohibit large vessel use beyond one nmi from the Islands. NOAA has been actively involved in commenting on proposed LNG projects adjacent to the Sanctuary. Regarding discharges from industrial traffic, Sanctuary regulations provide strong protections against pollution and discharges. Regarding noise impacts, see the response to comment 9.

279. Comment: DMP Strategy CS.2 - Comprehensive Data Management must include data on commercial shipping dynamics via the Automated Identification System, and CINMS staff must consider taking a leadership role in bringing this system online.

Response: CINMS staff have taken a lead role in working with the Navy, U.S. Coast Guard, and The Marine Exchange of Southern California to install an AIS transceiver station on Santa Cruz Island or Anacapa Island and integrate the data with an AIS transceiver station on San Nicolas Island. Once completed, NOAA will work with partners to facilitate the distribution and management of incoming AIS data. For more information about CINMS AIS activities see FMP Strategy CS.8 (Automated Identification System (AIS) Vessel Tracking).

280. Comment: On SDEIS pages five and seven, 6,980 and 7,000 are both used to present the same information about ship transits, but one number should be used consistently.

Response: NOAA did not use two different numbers to present the same information about ship transits. One number presents a general statement about yearly ship transits through the Santa Barbara Channel being "nearly 7,000," while the other number presents a statistic about Santa Barbara Channel ship transits in 2006 being "an estimated 6,980."

281. Comment: NOAA should incorporate the Santa Barbara Channel into the Sanctuary and reroute commercial ship traffic west of the Channel Islands.

Response: NOAA is not changing the CINMS boundary as part of this management plan review. However, NOAA will further analyze the boundary concepts in a separate environmental review process sometime in the future.

The shipping lanes were designated by the International Maritime Organization (IMO) and any modification of these lanes would be decided by this international body, not unilaterally by the United States or its executive branch agencies such as NOAA. Should the United States determine that the placement of the shipping lanes warrants reconsideration (for example, to reduce the risk of ship strikes on whales), the appropriate federal representatives would bring this information to the IMO.

WATER QUALITY

WATER QUALITY – ENHANCED PROTECTION

282. Comment: The final management plan and sanctuary regulations should make certain that the sanctuary is protected beyond minimum state and Federal pollution requirements.

Response: Both the existing and modified Sanctuary regulations go beyond state and other federal standards for the prohibition of waterborne pollution.

283. Comment: The EPA recommends the selection of NOAA's Alternative 1, which provides additional protections for water quality, including prohibiting the discharge of treated sewage from larger vessels and the at-sea transfer of petroleum-based products, materials or other matter ('lightering') within CINMS.

Response: Certain aspects of Alternative 1 are more protective to CINMS resources and qualities. However, at this time, in order to be consistent with the California Clean Coast Act, as well as with regulations proposed by the Monterey Bay, Cordell Bank, and Gulf of the Farallones national marine sanctuaries, NOAA is providing an exception for treated sewage discharges from oceangoing ships that do not have sufficient holding tank capacity to hold sewage while within the CINMS. See the FEIS for additional text and analysis on large vessel sewage discharge in the Sanctuary.

With regard to the prohibition of lightering, NOAA maintains that such a prohibition is not warranted at this time (see the response to comment 176). Regarding Alternative 1, see the response to comment 132.

WATER QUALITY – FUNDING

284. Comment: $20,000 per year, as indicated in the DMP, will not be commensurate with the workload associated with the Water Quality Protection Planning Strategy.

Response: The estimated costs for this strategy do not include staff time, which will be the principal cost of water quality program development. This strategy is focused on developing a plan for water quality protection, rather that implementation of specific tasks. Furthermore, as explained in the strategy's background text, the NMSP's West Coast Regional Office is playing a significant role in helping to develop a CINMS water quality protection plan (and is not reflected in estimated site costs for implementing this strategy). CINMS will continue to work to leverage partner resources, including funds, as appropriate.

WATER QUALITY – INCORPORATE SAC RECOMMENDATIONS

285. Comment: The management plan should be updated to indicate that the CINMS Advisory Council adopted the water quality needs assessment report in 2005, and that it is thus a product of the full Advisory Council rather than just the Conservation Working Group.

Response: NOAA has updated the FMP to note and describe the Sanctuary Advisory Council's adopted *Water Quality Needs Assessment for the Channel Islands National Marine Sanctuary.*

286. Comment: NOAA should incorporate the Advisory Council's water quality report recommendations into the management plan.

Response: NOAA has updated the FMP's Water Quality Action Plan, which now refers to the Sanctuary Advisory Council's 2005 report *A Water Quality Needs Assessment for the Channel Islands National Marine Sanctuary,* and the recommendations it contains. NOAA will work with the CINMS Advisory Council, its working groups, and other partners to implement the water quality strategy in the management plan, and to develop a detailed Sanctuary water quality protection plan that will describe knowledge and management gaps and how they may be addressed.

WATER QUALITY – OTHER

287. Comment: Comments support: CINMS' continued efforts to address water quality concerns in the Sanctuary; the heightened attention to specific threats to Sanctuary water quality; the management plan placing a high value on monitoring and improving water quality; and the regulations providing needed enhancements to CINMS water quality protection. Support also expressed for evaluating and understanding localized and large-scale spatial and temporal impacts from oceanographic and climatic changes, and coastal and offshore impacts from human population increases.

Response: Comment noted.

288. Comment: The Central Coast Water Board implements programs that address many of the priority sub-issues identified in the DMP and welcomes the opportunity to work cooperatively and proactively with the sanctuary on water quality issues.

Response: NOAA appreciates the Central Coast Water Board's support on Sanctuary water quality issues.

289. Comment: The DMP/DEIS should incorporate a broad-based approach and goals of the Ocean and Coastal Water Quality section of the five-year strategic plan of the California Ocean Protection Council (COPC).

Response: The CINMS Water Quality Action Plan provides the foundation for a broad based approach and outlines the process for developing a Sanctuary water quality protection plan. Sanctuary water

quality goals will be developed as part of this process, and may include some of the goals identified in the OPC's five-year strategic plan.

290. Comment: Water quality conservation is one of the most critical issues facing Sanctuary managers in the coming five years and beyond. While the three activities and updated regulations proposed in Strategy WQ.2 are a good start toward meeting this objective, growing threats to Sanctuary water quality warrant a much more proactive and aggressive approach by CINMS.

Response: Once strategy WQ.2 is implemented and CINMS has a water quality protection plan, NOAA will consider the future actions it will need to take to best implement the activities identified in the plan to address threats to Sanctuary water quality.

291. Comment: CINMS should convene a conference of Santa Barbara Channel-area water quality experts to catalyze the action planning process and facilitate the identification of issues that drive water quality action planning.

Response: As described in the background to Strategy WQ.2 in the FMP, CINMS will consult with area water quality experts as part of the process to develop a water quality protection plan.

292. Comment: The Water Quality Protection Planning strategy should explicitly assign a greater level of responsibility and leadership on initiating short term water quality protection to the Sanctuary managers.

Response: The NMSP and its managers have a responsibility to address Sanctuary water quality. NMSP and CINMS leadership are also accountable to NMSP performance measures, one of which calls for sanctuaries to maintain or improve water quality based on long term monitoring data.

293. Comment: There are way too many people on this coastline, the ocean is affected, and I'm sure it's going to affect the Sanctuary.

Response: Implementing the management plan's Water Quality Action Plan will enable CINMS, by working in close coordination with other area water quality managers, to better identify and address water quality threats to the Sanctuary.

294. Comment: The DMP should include discharges from ship accidents, and natural oil and gas seeps as important possible sources affecting Sanctuary water quality.

Response: NOAA has revised the FMP's Water Quality Action Plan to incorporate natural oil and gas seeps and discharges from vessel accidents in the discussion of possible sources of pollution affecting Sanctuary water quality.

295. Comment: Two commenters indicated that they agreed with or supported the water quality comments submitted by the Sanctuary Advisory Council's Conservation Working Group.

Response: Please refer to responses to the Conservation Working Group's comments, listed in the table at the beginning of this appendix under "Krop, Linda."

WATER QUALITY – RESEARCH AND MONITORING

296. Comment: Commenter encourages continued CINMS support for Plumes and Blooms project and an assessment of its management implications, and continued CINMS support for the Southern California Bight Regional Monitoring surveys.

Response: Comment noted. NOAA plans to continue support for these programs as described in the FMP.

297. Comment: NOAA should process and analyze water quality samples from the Bight '03 survey and the Pac Baroness shipwreck exploration.

Response: ACINMS samples taken during the Bight '03 survey have been lab processed, and the results are publicly available on the web site of the Southern California Coastal Water Research Project. In addition, lab tests on sediment samples taken from the wreck site of the Pac Baroness have been completed and some preliminary analysis work was done in 2007, yielding no striking results.

298. Comment: CINMS research effort should aim to determine the issues that will drive Sanctuary water quality action planning, and this should be included in the water quality monitoring strategy.

Response: CINMS staff will work with water quality experts and researchers, as appropriate, to identify and assess water quality issues during the process of developing a water quality protection program. These assessments will help set priorities for water quality research and monitoring efforts.

299. Comment: Water quality sampling of anchorage areas within the Sanctuary should be continued beyond the current pilot phase in order to provide a more comprehensive picture of potential water quality impacts associated with recreational boating around the Channel Islands. The sampling should be expanded to better assess high-use conditions by sampling more often during weekends and holidays. In addition, the monitoring protocol should be adapted based on results from the pilot phase. The management plan should reflect a commitment to this continued monitoring, and specify the subsequent research and management steps CINMS staff will take based on monitoring results.

Response: Monitoring of select anchorages and other sites within the Sanctuary took place in 2006, with Santa Barbara Channel Keeper performing the work under agreement with CINMS. In 2007, a report was produced by Santa Barbara Channel Keeper detailing the results of this monitoring effort. In the future, CINMS may continue and potentially expand this type of monitoring within the Sanctuary, as resources allow and upon further consideration of the efficacy of this approach. See activity 3 of Strategy WQ.1 for a description of CINMS water quality monitoring initiatives.

300. Comment: The management plan's Water Quality Action Plan Strategy WQ.1 should provide additional specificity to identify or at least propose specific measures CINMS staff can take to physically or institutionally support storm water plume researchers, such as with vessel time, lab space, human resources, etc. As written, the activity is too general with respect to existing information, SAC consensus, CINMS participation, and resource protection needs.

The management plan should also articulate CINMS support for future Bight Surveys by first allocating specific funding to analyze existing samples (and organize that data for public availability), and then by planning funding and human resources for extensive sampling, processing and water quality data management in upcoming Bight Surveys.

Response: Strategy WQ.1 now notes the importance of better understanding stormwater plumes and how they may affect Sanctuary water quality and living resources. Additional details with regard to specific new monitoring measures to be taken have not yet been developed, but are expected to result from implementation of the broader strategy to develop a water quality protection plan (WQ.2). Regarding the Bight '03 survey data, all CINMS samples taken during that project have been lab processed, and the results are publicly available on the web site of the Southern California Coastal Water Research Project. Furthermore, as the Water Quality Action Plan states, CINMS intends to continue support for future Bight Surveys.

301. Comment: NOAA should provide for systematic monitoring of anthropogenic marine debris.

Response: Marine debris is included in the description of water quality issues to be addressed through the Water Quality Action Plan, and NOAA may consider the suggestion of a systematic monitoring program for marine debris during the water quality protection planning process.

302. Comment: The Matilija Dam (Ventura County) is scheduled to removed, potentially impacting CINMS resources through increased sedimentation. Monitoring should be implemented to understand the impact of this dam removal.

Response: The Matilija dam is scheduled to be gradually removed starting in 2012. According to recent environmental assessments of dam removal, short term sediment stabilization will result in approximately 30% increase in coarse (sand and bigger) sediment at the associated beach over 50 years, which will be released gradually over 20-30 years, depending upon climate and hydrology. Fine sediments removed from the reservoir will be slurried downstream and placed within the 100 year floodplain. There is an estimate of potential increase in fine sediment plume from the river, but quantitatively this will be insignificant since the dam currently passes 100% of the fine sediment. At this time, NOAA will rely on the relevant federal and state authorities to monitor and report on increased sedimentation from dam removal, while also continuing to support related water quality, sediment and plume studies (See the response to comment 300).

WATER QUALITY – SPECIFY PLANS IN MORE DETAIL

303. Comment: The management plan needs more specificity regarding corrective actions for managing water quality impacts in the Sanctuary. The Water Quality Action Plan is relying almost entirely on a long-term bureaucratic process subject to Congressional funding, and the success or failure of Staff recruitment at the NMSP's regional level. This is particularly troubling given the array of documented water quality threats facing Channel Islands today, and the suite of relatively low-cost, actionable water quality conservation recommendations delivered from the Advisory Council to the Sanctuary Superintendent in 2005.

Response: The Water Quality Action Plan describes a future process that will build on the best available information, engage stakeholders and experts, identify and prioritize gaps in Sanctuary water quality protection, and propose management actions to address threats. NOAA understands that there are known issues and many specific recommendations that have been put forth by various individuals and the Sanctuary Advisory Council, and intends to build on those ideas. CINMS staff have added recent information to the Water Quality Action Plan, drawing on documents such as the water quality needs assessment endorsed by the Sanctuary Advisory Council. At this time, however, full details of what the water quality protection program would entail have not yet been decided upon, and will be determined through the process described in the Water Quality Action Plan.

WATER QUALITY – STAFFING

304. Comment: NOAA should expeditiously hire a new West Coast Region Water Quality Coordinator.

Response: The hiring of a regional water quality coordinator or other positions related to CINMS water quality protection planning will be considered as appropriate, and as resources allow. NOAA recognizes that resource limitations as well as the necessary program and partner developments may limit implementation of all of the activities in the various action plans. NOAA will continue to work with the Department of Commerce, Office of Management and Budget, and Congress in developing supporting justifications when preparing budget submissions.

305. Comment: NOAA should consider creating a water quality specialist position at CINMS.

Response: As CINMS water quality protection program continues to evolve, NOAA will consider a new staff position. Any new position would, however, be contingent upon the availability of resources and the staffing needs required for addressing identified issues and actions.

WATER QUALITY – WATERSHED APPROACH

306. Comment: Given that land-based activities can have a dramatic effect on water quality, the Sanctuary should take a watershed approach in coordination with other agencies and groups involved in water quality management.

Response: A watershed approach and coordination with other agencies is important when addressing CINMS water quality issues. NOAA will work in close collaboration with area water quality partners in the development of the CINMS water quality protection plan, and will consider the task force suggestion.

WATER QUALITY – WORKING GROUP

307. Comment: The management plan should establish a Water Quality Working Group within the SAC. Any Water Quality Protection Program the working group develops should be similar to that at the Monterey Bay National Marine Sanctuary.

Response: CINMS staff and Advisory Council members have been discussing the potential formation of a Water Quality Working Group for several years. As CINMS implements Strategy WQ.2, staff will revisit this idea with the Advisory Council. Process approaches, such as the possible formation of a Working Group, will be defined at that point. Stakeholder and expert participation is a hallmark of the Sanctuary's management approach, and will be part of the overall process to develop a water quality protection program. As Strategy WQ.2 notes, CINMS will use, to the extent appropriate, the existing Monterey Bay National Marine Sanctuary Water Quality Protection Program as a model.

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APPENDIX C

BIOLOGICAL AND HISTORICAL/CULTURAL RESOURCES OF THE STUDY AREA FOR THE CHANNEL ISLANDS NATIONAL MARINE SANCTUARY MANAGEMENT PLAN UPDATE

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1.0 BIOLOGICAL RESOURCES

As a supplement to FEIS section 3, Affected Environment, this appendix provides additional information on the biological resources within the Study Area for this Environmental Impact Statement (EIS), including the Channel Islands National Marine Sanctuary (CINMS) and surrounding area. This includes additional discussion of habitats and species present, including special-status species, such as rare, threatened, or endangered species. Much of this information was taken directly from the 2002 document *Marine Protected Areas in NOAA's Channel Islands National Marine Sanctuary - Final Environmental Document* (California Department of Fish and Game 2002), available on line at http://www.dfg.ca.gov/mrd/ci_ceqa/index.html, with the cooperation of the California Department of Fish and Game.

1.1 HABITAT TYPES

Important habitats in the CINMS are classified according to a simple, multidimensional habitat classification, using depth, exposure, substrate type, and dominant plant assemblages (Table C-1). The classification was conducted used existing maps and sediment samples taken throughout the CINMS. These included a Shoreline Inventory Database (Minerals Management Service [MMS] 2000) that describes a variety of coastal features in Santa Barbara County, a series of maps of over 5,000 sediment grabs around the Channel Islands (Amuedo and Ivey, Engineers 1967), a database of soft sediment samples in the northern Channel Islands (U.S. Geological Survey [USGS] unpublished data) and substrate maps of the sea floor around Channel Islands (MMS 1984).

These sources were combined using a geographic information system (GIS) to develop a comprehensive substrate map of the CINMS, divided into soft substrate (*e.g.*, mud, sand, gravel) and hard substrate (*e.g.*, rock, boulder, bedrock). A bathymetric map of the Channel Islands (Waltenberger 1995) was used to distinguish habitat types at the following depth intervals: shoreline, euphotic zone (intertidal–30 meters), upper continental shelf (30–100 meters), lower continental shelf (100–200 meter), continental slope (>200 m). Dominant plant species, including giant kelp and seagrasses, form marine habitats used by diverse groups of invertebrates, fish, mammals and seabirds (Anderson *et al.* 1993). The potential distribution of giant kelp around the northern Channel Islands and Santa Barbara Island was determined from aerial photographs of the region between 1980 and 1989 (Ecoscan 1989). Most of the kelp (approximately 17.2 square nautical miles [nmi^2]) is concentrated on the southwestern coasts of San Miguel and Santa Rosa islands.

The habitat types that occur in the Study Area for this EIS, are discussed below, following Table C-1.

Table C-1. Habitat Classification and the Approximate Abundance of Each Criterion in Each of the Biogeographical Regions in the CINMS

Ecological Criteria	Units	Oregonian Bioregion	Transition Zone	Californian Bioregion
Coastline characteristics				
1. Sandy beach	mi of coastline	24.8	13.8	4.7
2. Rocky coast (low exposure)	mi of coastline	28.2	11.6	12.5
3. Rocky coast (high exposure)	mi of coastline	27.4	13.6	1.4
Substrate type and depth				
4. Soft sediment (0–30 m)	square nmi	38.9	29.6	16.4
5. Hard sediment (0–30 m)	square nmi	34.3	7.2	6.6
6. Soft sediment (30–100 m)	square nmi	211.6	63.6	56.2
7. Hard sediment (30–100 m)	square nmi	23.4	10.1	3.9
8. Soft sediment (100–200 m)	square nmi	157	62.9	27.2
9. Hard sediment (100–200 m)	square nmi	-	7.3	1.1
10. Soft sediment (>200 m)	square nmi	226.7	176.9	160.7
11. Hard sediment (>200 m)	square nmi	-	14.6	2.3
Additional features				
12. Emergent rocks (nearshore)	no. <1 nmi/ from shore	216	208	95
13. Emergent rocks (offshore)	no. >1 nmi/ from shore	12	5	1
14. Submerged rocky features (pinnacles, ridges, seamounts)	square nmi	5.9	26.7	4
15. Submarine canyons	square nmi	1	33.7	5
Dominant plant communities				
16. Giant kelp	square nmi	16.1	5.9	1.8
17. Surfgrass	square nmi	13.4	6.7	3.2
18. Eelgrass	square nmi	0.3	0.1	0.2

Source: California Department of Fish and Game 2002.

1.1.1 Intertidal Habitat

The intertidal zone is comprised of a variety of coastal habitats that are 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. The vertical extent of tidal change within the Channel Islands can be as high as 3 meters (+2.4 to -0.6 meters) during full or new moon periods. On surf-swept rocky cliffs, the wave splash can extend the marine influence upward another 5 meters or more. Shores with lesser slopes have broader intertidal surface areas although less splash influence. Low-sloping shores have intertidal regions tens of meters wide.

The intertidal zone is typically divided into four sub-zones defined by tidal exposure (Ricketts and Calvin 1968). The infrequently wetted splash zone includes the area from the highest reach of spray down to the mean high tide line. The high tide zone, exposed more often to air than water, extends from mean high tide level down to the average height of the higher of the two daily low tides. The middle intertidal zone, ranging from mean higher low water to mean lower low water (zero tide level), is typically covered and uncovered twice each day. The low intertidal is normally uncovered only by minus tides. In addition, tidepools, special intertidal features, support pockets of continually submerged life at varying shore levels. Intertidal habitats vary in the type of substrate and degree of exposure to surf. Bottom types in intertidal zones include fine muds, sand, gravel, cobble, boulders, and bedrock. Rock types range from soft sedimentary to hard metamorphic forms. Rocks also vary in the extent of roughness, depressions, cracks, crevices, and vertical relief. Protected embayments and estuaries contain mostly fine particulate substrates while outer coast shores range in composition from sand to various rock types.

The plants and animals inhabiting intertidal shores are subject to periodic immersion in water followed by exposure to air. These intertidal communities must withstand varying degrees of wave shock, dramatic temperature changes, desiccation, and attacks from terrestrial predators. Algae are rare on unconsolidated muddy or sandy shores and much of the invertebrate life, such as worms, crustaceans, snails, and clams dwell under the substrate. Rocky shores support a rich assortment of plants and animals. Numerous green, brown, and red algae are found on rocky shores 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. Fishes are limited to tidepools or passing through the intertidal zone at high tide. Seabirds forage in the intertidal zone at low tide. Some seabirds roost in aggregations on cliffs just above the shore. Seals and sea lions haul out on particular intertidal shores, sometimes in dense aggregations.

The Channel Islands experience varying degrees of exposure to winds, waves, currents, and a range of water temperatures. Lacking major rivers and shallow coastal shelves, island shores are predominantly rocky. Of the five islands, Santa Barbara Island has the most bedrock (74 percent), and Santa Rosa the least (62 percent). Santa Barbara Island also has the greatest expanse of boulder beaches (22 percent) while San Miguel Island has almost none (0.2 percent). San Miguel and Santa Rosa Islands have the greatest extent of sandy beaches (36 percent and 33 percent, respectively). Sandy beaches on the Northern Channel Islands occur primarily on the southern shores, except for San Miguel Island, which has sandy beaches on north and south shores.

1.1.2 Subtidal Habitat

Subtidal habitats include those marine habitats ranging from the lower limit of the intertidal zone down to deepwater offshore. To separate nearshore from offshore environments, nearshore subtidal habitats have been defined as depths of 30 meters because these relatively shallow depths are most influenced by coastal oceanographic processes and light levels diminish rapidly in this zone such that few benthic algae exist at greater depths. Nearshore subtidal habitats include mud, sand, gravel, cobble, and bedrock substrates. Rock types range from soft sedimentary to hard metamorphic forms. Protected embayments and estuaries contain mostly fine particulate substrates, while outer coast shores range in composition from sand to various rock types. Though less variable than the intertidal zone, shallow-water habitats are subject to dynamic physical processes, including wave exposures, along-shore currents, upwelling, temperature/salinity/nutrient differentials, and suspended sediment loads.

Typical shallow subtidal areas contain assemblages of plants dominated by giant kelp, invertebrates, and fishes. However, many shallow reefs overgrazed by sea urchins have little macroalgae and greatly reduced species diversity. Deeper current-swept reefs with lower light levels support suspension-feeding

invertebrates, including sponges, sea anemones, sea fans, plume worms, bryozoans, and tunicates. Some low-relief rock/cobble/sand habitats in high current areas are dominated by large numbers of filter-feeding brittle stars (*Ophiothrix spiculata*) or sea cucumbers (*Pachythyone rubra*).

1.1.2.1 Nearshore Subtidal - Soft Bottoms

Along unprotected shores, plants cannot anchor on the shifting sands, and surface-dwelling animals are limited to hardy species specially adapted to this rigorous, featureless environment. Such animals include sea pens, sea pansies, sand crabs, moon snails, sand dollars, sand stars, bottom-dwelling sharks and rays, and flatfishes. More animals and some plants occur on protected, stable sand habitats found in the lee of ocean swells or in deeper water less exposed to surge. In contrast to the relatively sparse community living above the sand, a diverse assemblage dwells within the soft sediment. These typically small infaunal (life within the substrate) organisms include worms, crustaceans, snails, and clams. Populations can be quite variable in shallow areas with heavy surge, but they become more stable in calmer and deeper waters.

Many sandy habitats at the islands have relatively steep slopes. The sand on these slopes often is coarse shell debris because there is little sediment runoff from land and strong water currents sweep away organic material. Stable sand habitats with fine grain sediments generally are 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. Rocky habitats at the islands are widespread, especially high-relief volcanic reefs with walls, ledges, caves, and pinnacles. Low-relief sedimentary reefs exist as well, particularly around Santa Rosa Island.

1.1.2.2 Nearshore Subtidal - Hard Bottoms

Rocky subtidal environments are capable of supporting thousands of plant, invertebrate, and fish species, depending on the extent of habitat heterogeneity and influence of physical factors such as water motion, light, temperature, nutrients, and sedimentation. Boring clams and sea urchins create holes and depressions in soft sedimentary reefs that also are utilized by other smaller creatures. These reefs can be broken up or worn down by waves and surge. In addition to hardness, rocks vary in the extent of roughness, cracks, crevices, and vertical relief, all of which provide microhabitats for a host of organisms, including worms, crustaceans, mollusks, brittle stars, and fishes. Water motion can increase ecosystem productivity by supplying planktonic food to filter and suspension feeding invertebrates such as sponges, cnidarians, plume worms, bivalves, and tunicates. In contrast, sedimentation can cover rock surfaces and reduce productivity by preventing settlement of spores and larvae, by clogging filtering apparatuses, and by blocking light required by plants.

Plants need light and nutrients for photosynthesis, and hence are more abundant in shallow water. Numerous green, brown, and red algae occur, as well as surfgrass. Algae may form crusts, turfs, large blades, stalked plants, or tall kelps. Plants provide microhabitats and food for animals, but they also compete for space with sessile invertebrates. As light diminishes in deeper water, plants disappear. Here reefs become increasingly covered with attached invertebrates (*e.g.*, sponges, sea anemones, cup corals, sea fans, plume worms, rock scallops, and tunicates), which in shallow habitats, often are limited to vertical surfaces and under hangs not suitable for plants.

The distribution of shallow subtidal reefs is less well known than the distribution of the rocky intertidal reefs. Large-scale studies have not been done, and the rigorous ocean conditions in many areas make scuba diving surveys difficult. Often nearshore reefs are found where rocky intertidal habitat occurs. Kelp beds generally are good indicators of subtidal reefs (except for beds of the *Macrocystis angustifolia*

form that occur on sand). Kelp canopies have been mapped by aerial surveys (Crandel 1915; Ecoscan 1989; Hodder and Mel 1978).

Short-lived, opportunistic species commonly occur on freshly exposed rock surfaces. Deeper nearshore habitats are often dominated by extensive algal cover, including red algae and sea palms. The cold, nutrient-rich waters of the northern islands support well-developed assemblages of suspension-feeding invertebrates (*e.g.*, sponges, anemones, plume worms, bryozoans, and tunicates), as well as algal grazers such as snails, sea urchins, and crabs. Fishes, such as rockfishes, are characteristic of the cold-water Oregonian bioregion.

1.1.2.3 Offshore Subtidal

Beyond the nearshore subtidal zone are deep-water habitats extending from 30 to >200 meters deep over the continental shelf and slope. East of the continental slope, the Continental Borderland is characterized by ridges, basins, and submarine canyons. The Santa Barbara Basin, which reaches a depth of 590 meters, is prominent in the Santa Barbara Channel. Well over 90 percent of deep-water benthic habitats in the Channels Islands consist of fine sands in shallower portions, grading into silt and clay-dominated sediments in deeper portions (Science Applications International Corporation [SAIC] 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.

Records of the bottom composition for the remaining hard-bottom areas are incomplete and are based on old lead-line soundings, snags reported by fishermen, and geophysical surveys conducted by the USGS and oil companies. Direct observational evidence has revealed that many previously reported hard-bottom areas are not exposed rock but reefs covered by soft sediments (SAIC 1986). Deep rock bottoms often are located offshore from major headlands and islands, and on the highest parts of undersea ridges, banks, and pinnacles. Most of the deep-water hard bottom substrates are low-relief reefs less than 1 meter in height; some reefs have 1- to 5-meter high features. Boulders and bedrock outcrops are the predominant rocky substrates. Higher relief pinnacles and ridges occur in some areas, such as off the northwest end of San Miguel Island.

Light disappears rapidly below 50-meter depths, thus offshore benthic habitats do not support marine algae and plants. The fauna of these habitats have been described from remote grab, dredge, trawl, remote-operated vehicle (ROV), and manned submersible surveys conducted from surface vessels for research, fisheries, and environmental studies, especially those related to municipal outfalls and oil development activities. Major deep-water biological surveys include those conducted for the Bureau of Land Management (BLM) (Fauchald and Jones 1979a,b), the Southern California Coastal Water Research Project (SCCWRP) (*e.g.*, Allen *et al.* 1998), and the MMS (Blake and Lissner 1993; SAIC 1986).

Offshore deep-water communities have few species in common with nearshore communities, due in part to cold temperatures and reduced light. The composition of deep assemblages depends particularly on sediment composition, water depth, vertical relief, and extent of siltation (SAIC 1986; Thompson *et al.* 1993). For a given depth, deep assemblages tend to be more similar over broad geographic ranges than shallow-water communities because the physical environment (*e.g.*, temperature, salinity, darkness) is fairly stable. Most deep muddy-bottom invertebrates are detritus feeders while rocky-substrate invertebrates are predominantly suspension-feeders. Low-relief deep reefs often are heavily silted, with greatly reduced species diversity. Increasing siltation smothers attached invertebrates, gradually changing the habitat to soft bottom. Scour from deep-water currents also influences the distribution of marine life.

The stability of most deep-water soft-bottom habitats supports greater diversity of infaunal and epifauna (life on or just above the substrate) compared to shallow particulate substrates disturbed by waves and surge. Typical infauna on deep fine-sediment habitats include sea pens (*Stylatula elongata* and *Ptilosarcus gurneyi*), polychaete worms (*Heteromastus* sp., *Prionospio lobulata*, and *Chloeia pinnata*), echiuran worms (*Urechis* sp.), amphipods (*Orchestoidea* spp., *Photis* spp., *Polycheria* sp., *Oligochinus* sp., and *Caprella* spp.), brittle stars (*Amphiodia squamata* and *A. urtica*), and small snails and clams (Family Mollusca). Epifauna include shrimp (*Pandalus* spp.), octopus (*Octopus* spp.), sea cucumbers (*Parastichopus* spp.), seastars (Class Asteroidea), heart urchins (*Lovenia* spp.), and flatfishes (Families Bothidae and Pleuronectidae). Fauchald and Jones (1979a,b, 1983) and Thompson *et al.* (1993) divide the assemblages into four major benthic habitats: (1) mainland shelves (50 to 150 meters) often dominated by brittle stars; (2) offshore shelves, ridges, and banks (50 to 500 meters) with brittle stars, the clam *(Parvilucina tenuisculpta*), the polychaete (*Chloeia pinnata*), and the amphipod (*Photis* spp.); (3) basin slopes (150 to 600 meters) with the polychaete worms most common in the Santa Barbara Channel; and (4) basin floors (deeper than 600 meters) where assemblages are not stable over time because these areas often experience anoxic conditions.

Common invertebrates on deep hard substrates include sponges, anemones, cup corals, sea fans, bryozoans, feather stars, brittle stars, sea stars, and lamp shells. Demersal fishes can be common in these habitats, especially various species of rockfishes. In the northern Santa Barbara Channel, three principal hard bottom assemblages were described for outer shelf-upper slope depths (105-213 meters) in MMS surveys (SAIC 1986): (1) a low-relief assemblage dominated by anemones, brittle stars, and lamp shells; (2) a medium relief assemblage characterized by the anemone *Corynactis californica* and deep-water coral *Lophelia californica*; and (3) a broadly distributed community composed of the anemone *Metridium senile*, cup corals, and the feather star *Florometra serratissima*.

1.1.3 Kelp Forest Habitat

Giant kelp (*Macrocystis pyrifera*) forms extensive underwater beds on rocky substrates (the *M. angustifolia* form on the south coast occurs on sand) at shallow subtidal depths (3 to 45 meters) throughout the project area (see Figure C-1 below). Giant kelp, a keystone species, transforms reefs into lush underwater forests. This highly productive plant provides 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).

Giant kelp forests range from San Francisco to central Baja California. Giant kelp is a perennial species that has multiple fronds buoyed up by pneumatocysts arising from a large holdfast. Individual fronds live only about 6 months (during which time they may grow 30 meters or more in length), but new fronds are continually produced during the several year life span of the plant (Rosenthal *et al.* 1974). Giant kelp has a life cycle that alternates between the large sporophyte phase and a microscopic gametophyte generation. The impressive underwater kelp forests with extensive surface canopies are conspicuous and popular features of this region. The complex vertical structure of highly productive kelp ecosystems provides food, attachment sites, and shelter for a diverse assemblage of plants and animals, many of which are targeted for sport and commercial harvest. Kelp itself is harvested commercially for use in a wide variety of food and industrial products.

The particular structure of plant and animal assemblages within kelp forests depends on many factors, including the nature and profile of the substrate, degree of wave exposure, water clarity, and temperature/nutrient conditions (Ebeling *et al.* 1980a; Foster and Schiel 1985; Hodder and Mel 1978; Murray and Bray 1993). Kelp beds typically have several layers of understory algae that increase habitat heterogeneity (Dayton *et al.* 1984: Foster and Schiel 1985). Boa kelp, palm kelps, and bladder weeds can rise 1 or more meters off the bottom like bushes. Below these are smaller prostrate or low-growing algae

less than 1 meter in height. Below these kelps can be a turf layer, and finally a crust layer often dominated by pink coralline algae.

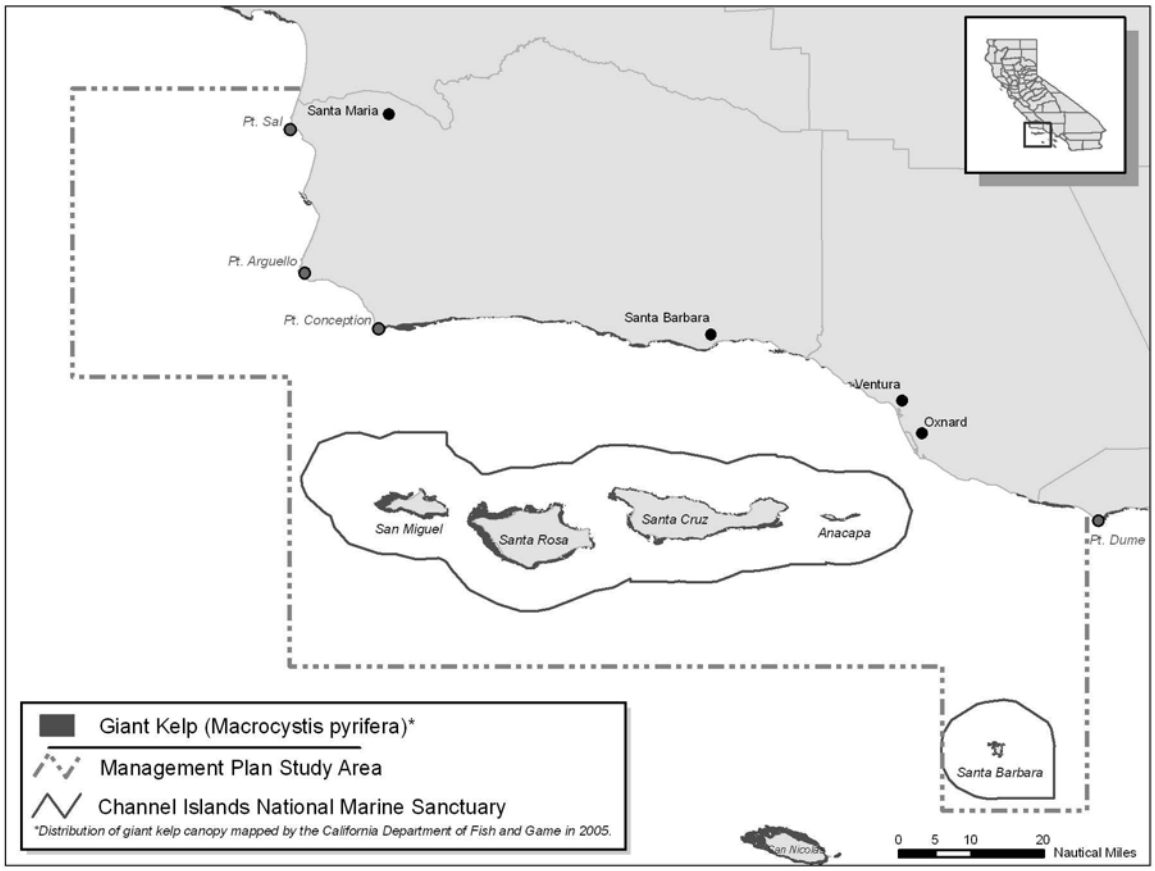

Figure C-1. Giant Kelp Canopies of the CINMS
Source: Christensen 2003. Data compiled from 1988, 1999, 2002

The location and extent of kelp beds in the Southern California Bight (SCB) have been determined at various times through aerial photographic surveys by commercial harvesters, Bureau of Land Management, Department of Fish and Game, and others (Crandall 1915; Hodder and Mel 1978; Kelco unpublished maps; Neushul 1981). Locations supporting kelp generally have been consistent through time, but the extent of these beds has varied considerably. The physical settings for kelp habitats around the Channel Islands are more variable than mainland locations (Hodder and Mel 1978). Extent of wave exposure, substrate types, and slopes vary extensively. Water clarity is greater at the islands, allowing light to penetrate deeper, thus kelp ranges into deeper water compared to the mainland. The greater habitat heterogeneity at the islands has resulted in greater kelp forest species diversity compared to mainland kelp beds (Murray and Bray 1993).

Kelp mortality can occur from various physical and biological conditions. Powerful storm swells can rip out plants that entangle other plants, resulting in considerable losses. These largely seasonal (winter) disturbances are most prevalent in exposed locations. High temperature/low nutrient conditions may cause deterioration of kelp in the warmest summer months and during El Niño periods (Foster and Schiel 1985; Murray and Bray 1993; Tegner and Dayton 1987). Increased turbidity and sedimentation in kelp habitats can reduce productivity and increase mortality, particularly of the microscopic gametophyte and tiny sporophyte stages (Dean and Deysher 1983).

Grazing invertebrates and fishes consume kelp. Sea urchins are especially efficient at munching through kelp holdfasts, causing detached plants to drift away. Normally dwelling in crevices where they feed on drift kelp, urchins may emerge when drift plants are scarce and overgraze entire kelp beds, turning areas into "urchin barrens" (Ebeling *et al.* 1985; Foster and Schiel 1985; Murray and Bray 1993). These overgrazed areas can persist because high densities of urchins are capable of surviving in a near-starvation state while consuming any edible plants that settle from the plankton (Carroll *et al.* 2000). Urchin barrens have become increasingly common during the past two decades at the Channel Islands coincident with the long-term warming period accompanied by numerous El Niño events and unusually powerful storms (Engle unpublished data).

Kelp beds also are foraging habitats for seabirds and marine mammals. Cormorants dive through the forests seeking fish; while gulls, pelicans, and terns hunt surface fishes in or near the canopy. Where sea otters occur, they are closely associated with kelp beds, diving for a variety of invertebrate prey. Sea lions, seals, and occasional whales use kelp beds as foraging areas.

1.1.4 Surfgrass and Eelgrass Habitat

There are two types of marine flowering plants found in the CINMS consisting of four species. Surfgrass (*Phyllospadix spp*.) and eelgrass (*Zostera spp.*) are commonly confused due to their similar appearance. Each forms dense beds on different substrate and in different conditions.

1.1.4.1 Surfgrass (*Phyllospadix* spp.)

Surfgrass attaches by short roots to rock on surf-swept shores from the low intertidal zone to depths of 10 to 15 meters. The emerald green grass commonly occurs in dense perennial beds 0.5 to 2 meters tall formed primarily by vegetative growth from spreading rhizomes. Two species (*Phyllospadix torreyi* and *P. scouleri*) overlap in geographical distribution and morphological characteristics (Dawson and Foster 1982). *Phyllospadix torreyi* generally has longer (1 to 2 meters), narrower (1 to 2 millimeters) leaves, longer flower stems with several spadices (floral spikes), and occurs more in semi-protected habitats as well as in deeper water. *Phyllospadix scouleri* tends to have shorter (less than 50 centimeters), broader (2 to 4 millimeters) leaves, shorter flower stems with 1 to 2 spadices, and is found more often in wave-swept intertidal areas (see Figure C-2 below).

Surfgrass beds are highly productive ecosystems, providing structurally complex microhabitats for a rich variety of epiphytes, epibenthos, and infaunal species. Stewart and Myers (1980) identified 71 species of algae and 90 species of invertebrates associated with surfgrass habitats in San Diego. Some organisms, such as the red algae *Smithora naiadum* and *Melobesia mediocris*, are exclusive epiphytes on surfgrass (or eelgrass) (Abbott and Hollenberg 1976). *Phyllospadix* spp. beds provide nursery habitat for various fishes and invertebrates, including the California spiny lobster (*Panulirus interruptus*) (Engle 1979).

Surfgrass beds are persistent (Turner 1985) and can preempt space from other plants, including boa kelp (Black 1974) and sargassum weed (Deysher and Norton 1982). Surfgrass cannot tolerate much heat or drying; the leaves will bleach quickly when midday low tides occur during hot, calm-water periods. Surfgrass can be particularly sensitive to sewage discharge (Littler and Murray 1975) and oil pollution (Foster *et al.* 1988). Recovery can be relatively rapid if the rhizome systems remain functional, but it might take many years if entire beds are lost because recruitment is irregular and must be facilitated by the presence of perennial turf algae to which surf grass seeds attach (Turner 1983, 1985).

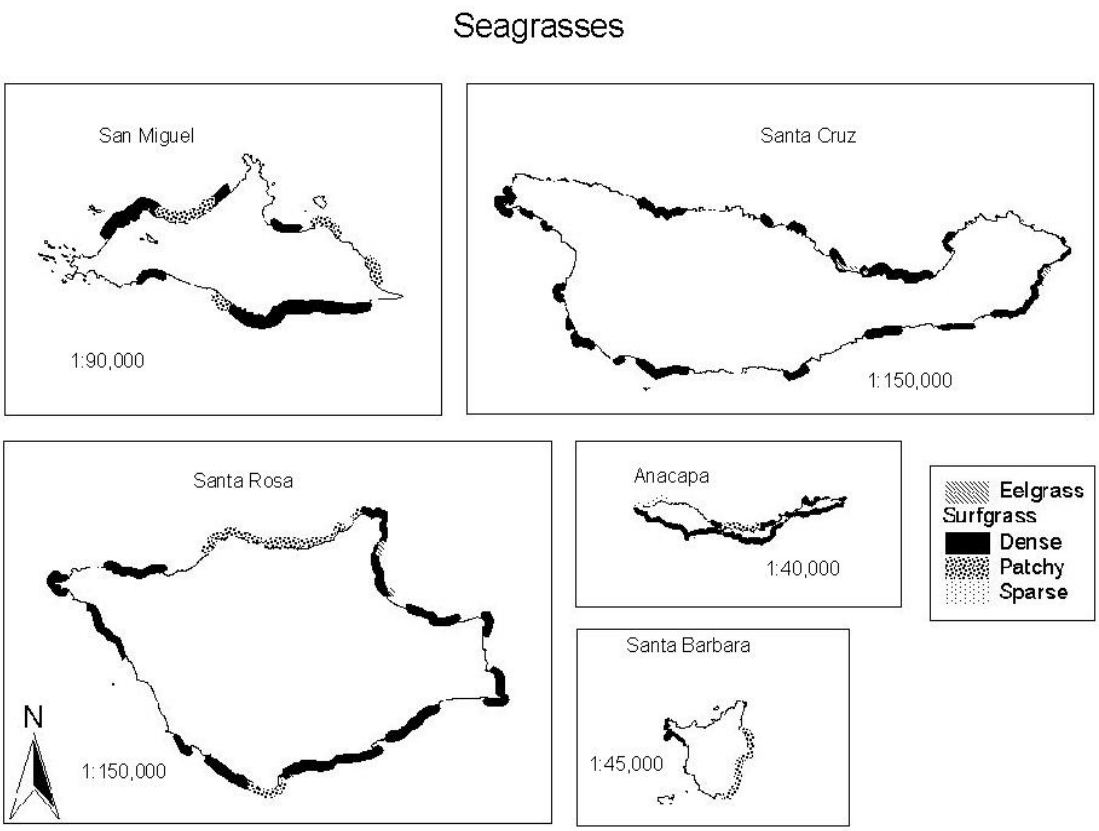

Figure C-2. Distribution of Seagrasses Within the CINMS

1.1.4.2 Eelgrass (*Zostera* spp.)

Eelgrass is the second type of flowering plant that grows within the CINMS. Eelgrass beds are known to be ecologically important for primary production, nutrient cycling, and substrate stabilization (Phillips 1984). They provide habitat and food for a unique assemblage of plants, invertebrates, and fishes (den Hartog 1970; McConnaughey and McRoy 1979; Phillips 1984). Eelgrass grows worldwide in quiet, temperate-water mud or sand habitats, especially in bays and estuaries from the low tide level down to 6 meters. It also occurs on sheltered substrates on the open coast to depths of 18 to 30 meters. The shallow limit for *Zostera* is generally determined by wave action while the deep limit is determined by light limitations (den Hartog 1970; Phillips 1984). Open coast subtidal *Zostera* beds have not been well studied, but extensive literature exists for embayment meadows (den Hartog 1970 and Phillips, 1984 for overviews). Eelgrass produces seeds that may drop nearby or can be carried by floating flower stalks to distant locations. The viability of seeds can be low and successful recruitment to new habitats relatively rare (den Hartog 1970; Phillips 1984). Once established, *Zostera* patches can expand to form vast meadows through vegetative growth along extended rhizomes.

All eelgrass throughout California was considered to be *Z. marina* until Phillips and Echeverria (1990) reported *Z. asiatica* along the mainland coast from Tomales Bay to Santa Monica. Typical characteristics of *Z. marina* include: presence at depths less than 5 meters, leaf width 1 to 12 millimeters, leaf tips obtuse, seeds ridged, March flowering, and seeds present May to June. In contrast, *Z. asiatica* characteristics include: 5- to 17-meter depths, leaf width 12 to 18 millimeters, leaf tips notched, seeds smooth, August flowering, and seeds present September to October. However, characteristics for the two species are variable and intergrade such that species designation is difficult and subject to continuing scientific debate.

At the Channel Islands, a total of 278 species (and higher taxa) were identified from eelgrass beds, not including most infaunal species, species requiring laboratory identification, or minute species (Engle *et al.* unpublished data). The diversity of conspicuous plant, invertebrate, and fish epibiota was nearly twice as high within eelgrass beds (approximately 150 species) as on surrounding sand habitats (approximately 80 species).

Important invertebrates include sea anemones, worms, crabs, snails, clams, and seastars. Some species are obligate dependents on *Zostera*. In the Channel Islands the brown alga *Punctaria occidentalis*, the flatworm, *Phylloplana viridis*, the sea hare, *Phyllaplysia taylori*, and the limpet, *Tectura depicta*, are epiphytes unique on *Zostera*. The red algae, *Smithora naidum* and *Melobesia mediocris*, also occur on eelgrass and surfgrass (*Phyllospadix spp*.). The isopod, *Idotea resecata*, pipefish, *Syngnathus sp.*, and giant kelpfish, *Heterostichus rostratus*, can occur with other plants, but they are closely associated with eelgrass, often appearing grass green in color. *Zostera* meadows are nursery habitats for a variety of fishes, including bottom-dwellers (*e.g.,* flatfishes and gobies) and epibenthic swimmers (*e.g.,* clinids, seaperches, and basses). Eelgrass beds at the Channel Islands are host to schools of juvenile fishes, especially giant kelp fish, surf perches, senoritas, olive rockfish, and kelp bass (Engle *et al.* unpublished data).

Eelgrass habitats are vulnerable to oil spills, but the impacts are not well understood. Unlike slime-producing algae that can slough off oil, eelgrass has non-mucilaginous leaves to which oil quickly adheres (CDFG 2002). Jackson *et al.* (1989) reported substantial oil effects on tropical grass beds of Panama; however, Dean *et al.* (1996) found neither acute nor sub-lethal effects on Alaskan eelgrass. Adverse effects on invertebrate communities associated with eelgrass beds have been documented more clearly: hydrocarbons were most persistent, recovery longer, and injury levels higher in eelgrass habitats of Alaska (Dean *et al.* 1996). Other threats to eelgrass meadows include pollution, habitat disturbances from development (*e.g.*, changes in sediment runoff and water clarity, piers, moorings), cumulative impacts from boat anchors, and overgrazing by sea urchins.

Eelgrass has been found at 10 locations around the Northern Channel Islands at depths of 3 to 15 meters (see Figure C-2), but it is unclear which species is present because their characteristics intergrade (Engle *et al.* in press). The *Zostera* sites occur on both north and south sides of the islands in coves sheltered from west and northwest swells. The largest beds (approximately 3 to 12 hectares) occur at Smugglers Cove, Canada del Agua, and Prisoners Harbor on Santa Cruz Island and at Bechers Bay on Santa Rosa Island. Moderate beds (approximately 0.3 to 0.7 hectare) 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.

1.1.5 Water Column Habitats

The water column habitat can be subdivided into the neritic/epipelagic, mesopelagic, and bathypelagic zones (Cross and Allen 1993). Light penetration, water temperature, and water mass structure define vertical zonation.

Neritic/epipelagic habitats in the Channel Islands extend to depths of 100 meters. This zone is euphotic generally to 30 meters, and temperatures fluctuate diurnally and seasonally. It is approximately 50 meters deep in turbid nearshore waters and expands offshore in clear oceanic waters (Cross and Allen 1993). The neritic/epipelagic zone is inhabited by fishes that migrate to the surface waters at night (nyctoepipelagic), bottom-associated species that feed in the water column (nektobenthic) (Horn 1980), and the eggs and larvae of most pelagic and demersal fishes (Loeb *et al.* 1983).

The mesopelagic zone is characterized by steep environmental gradients. It extends from the permanent thermocline below the compensation depth to the 6-degree C isotherm at 500 to 600 meters (Cross and Allen 1993). The bathypelagic zone is characterized by uniformity and extends nearly to the bottom. It is absent or restricted in the nearshore basins and expands offshore (Cross and Allen 1993). Fish typical of the mesopelagic and bathypelagic zones include species from the following families: Alepisauridae (lancetfishes), Anoplomatidae (sablefishes), Bathylagidae (deep-sea smelts and owlfishes), Cottidae (sculpins and blob sculpins), Gonostomatidae (bristlemouths), Liparidae (snailfishes), Macrouridae (rattails or grenadiers), Moridae (codlings or morids), Myctophidae (lanternfishes), Nemichthyidae (snipe eels), Ophidiidae (cusk-eels and brotulas), Sternoptychidae (hatchetfishes), Stomiidae (dragonfishes and viperfishes), and Zoarcidae (eelpouts) (Drazen 2003).

1.1.6 Marsh Habitats

1.1.6.1 Freshwater Marsh Habitats

Freshwater marsh habitats occur in areas where water remains at or near the ground surface for the entire year and soils remain saturated. Freshwater marshes occur predominantly in perennial watercourses along the mainland coastline of the Channel Islands region (examples include San Antonio Creek on Vandenberg Air Force Base and the Santa Ynez, Ventura, and Santa Clara rivers) but also in vernal pools, swales and other natural and artificial water impoundments (McGinnis 2000).

The growth of plant species in freshwater marshes is greatest during the summer months. Dominant plant species include: California bullrush, tule, American bullrush, broad-leaved cattail, giant bur-reed, hoary nettle; a number of rushes and sedges.

1.1.6.2 Coastal Brackish and Salt Marsh Habitats

Serving as transition zones between freshwater and marine species, coastal brackish marsh habitats (such as estuaries) are important to many of the species found in the Sanctuary. Salinity in coastal marshes may vary considerably from site to site, but typically increases at high tide or during seasons of low freshwater runoff. This type of habitat usually transitions into coastal salt marsh habitat along the ocean and into freshwater marsh habitat at the mouths of rivers. Important regional coastal brackish marsh habitats include Shuman Canyon and San Antonio Lagoon on VAFB, the Santa Ynez River, Goleta Slough, Carpinteria Marsh, the Santa Clara river, Ormond Beach and Point Mugu Lagoon (McGinnis 2000).

In addition to Shuman Canyon and San Antonio Lagoon, VAFB includes the coastal ecosystems of the Santa Ynez River and the San Antonio Creek Estuary, which are habitat for a number of threatened and endangered species (U.S. Air Force 1997). These sensitive coastal systems contribute to the general health of the regional marine ecosystem by providing nutrients and habitat for birds, fish, pinnipeds and other marine species (U.S. Air Force 1997).

The Carpinteria Salt Marsh is habitat to at least 139 resident and transitory bird species (Ferren *et al*. 1996). The marsh provides habitat for reproductive populations of invertebrate species found only in estuarine environments, acts as a feeding ground for juveniles of the commercially important California halibut and other fish species. In addition, the Carpinteria Salt Marsh harbors several distinct species of plants, including the federally-listed and endangered salt marsh bird's-beak.

Farther south is Mugu Lagoon, the largest regional estuarine lagoon and one of the most pristine wetlands remaining in southern California (Saiki 1997). Contained entirely within the Naval Air Station at Point Mugu, Mugu Lagoon supports the greatest concentration of water birds between Morro Bay and

Anaheim-Bolsa Bay (Coastal Conservancy 1997).[15] As a remote site with restricted public access, Mugu Lagoon is recognized as one of the most important mainland roosting sites for the Anacapa Island breeding colony of California Brown Pelicans. The Lagoon also serves as an important staging area for other birds and seals moving to and from Anacapa Island. (Jaques *et al*. 1996).

1.1.7 Essential Fish Habitat (EFH)

The Pacific Fishery Management Council (PFMC) manages 93 species of fish under three Fishery Management Plans: 1) Coastal Pelagic Species Fishery Management Plan, 2) Pacific Salmon Fishery Management Plan, and 3) Pacific Groundfish Fishery Management Plan. The Magnuson-Stevens Act defines EFH as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." National Marine Fisheries Service (NMFS) guidelines state that "adverse effects from fishing may include physical, chemical, or biological alterations of the substrate, and loss of, or injury to, benthic organisms, prey species and their habitat, and other components of the ecosystem." The EFH has been established for five species of coastal pelagic species: Pacific sardine, Pacific mackerel, northern anchovy, jack mackerel, and market squid.

The EFH also has been established for 83 species of groundfish. EFH for Pacific Coast groundfish is defined as the aquatic habitat necessary to allow for groundfish production to support long-term sustainable fisheries for groundfish and for groundfish contributions to a healthy ecosystem. Descriptions of groundfish fishery EFH for each of the 83 species and their life stages result in over 400 EFH identifications. When these EFHs are taken together, the groundfish fishery EFH includes all waters from the mean higher high water line and the upriver extent of saltwater intrusion in river mouths, along the coast of Washington, Oregon, and California seaward to the boundary of the EEZ. The seven "composite" EFH identifications are as follows: estuarine, rocky shelf, non-rocky shelf, canyon, continental slope/basin, neritic zone (33 feet and shallower), and the oceanic zone (66 feet and deeper).

1.2 SPECIES

1.2.1 Plankton

1.2.1.1 Phytoplankton

Phytoplankton are single cell or colonial algal species that range in size over three orders of magnitude (Siebruth 1979). Phytoplankton can be classified according to size: very small species (autotrophic bacteria) are classified as picoplankton (0.2 to 2 micrometers), most are classified as nanoplankton (2 to 20 micrometers) or microplankton (20 to 200 micrometers), and a few large species as mesoplankton (0.2 to 20 millimeters) (Hardy 1993).

Phytoplankton form the base of the food web; they support grazing zooplankton, fish, and, through their decay, large quantities of marine bacteria. The success of zooplankton depends upon both the quantity and quality of their phytoplankton food supply (Dailey *et al.* 1993). For example, the fecundity (egg production) of zooplankton depends upon the nutritive value (*e.g.*, nitrogen content) of the phytoplankton on which they feed (Checkley 1980a, b). Fish production, in turn, is highly dependent on the growth and productivity of phytoplankton and zooplankton (Ryther 1969). The success of larval fish and their subsequent recruitment into the adult fish population often depend upon spatial and temporal concurrence of fish larvae with an abundance of their plankton food source (Mullin *et al.* 1985).

[15] A comprehensive survey of the biological and ecological importance of Mugu Lagoon is found in Jaques *et al.* (1996) and Saiki (1997).

Many species of phytoplankton inhabit the CINMS. Their relative abundance in terms of numbers, biomass, and production varies greatly both spatially and temporally. The two most abundant and important components of the phytoplankton community are generally the diatoms (bacillariophytes) and the dinoflagellates (pyrrophytes).

The community of larger (greater than 50 millimeters) phytoplankton in the CINMS includes a broad range of temperate water forms as well as forms that characteristically occur in either warmer or colder water. This diversity reflects the general transitional nature of the Channel Island's flora, which results from the physical oceanographic and mixing characteristics of the region. For example, incursions of exceptionally warm water currents in the area generally carry with them warm water species.

Seasonal and geographic variations in nanoplankton are remarkably stable, and variations in plankton productivity are due primarily to the larger microplankton. The coastal zone color scanner (CZCS) on the Nimbus 7 satellite has provided useful information on the distribution of phytoplankton by measuring chlorophyll over extensive areas of the SCB. Such data provide synoptic views of complex oceanographic regions, which are impractical to obtain from ships alone. Satellite imagery has also allowed the identification of persistent and striking biological features. Many of these recurring large-scale patterns were either unknown or only dimly perceived prior to the advent of satellite imagery. For example, Nimbus 7 CZCS imagery revealed the occurrence far offshore of a large region of high phytoplankton pigment, a biological "hot spot" that loosely overlies a system of submarine ridges, banks, and basins of the Continental Borderland. Shallow basins and enclosed shallow areas, such as the Santa Barbara Channel, consistently show high pigment content, with an approximately threefold change in phytoplankton pigment content over a distance of a few kilometers. These large-scale structures undergo significant monthly, seasonal, and annual changes although the large-scale pigment patterns for a given season tend to reappear from one year to another (Pelaez and McGowan 1986).

Numerous measurements of primary production (the photosynthetic conversion of inorganic carbon to organic cellular material by phytoplankton), have been conducted in the SCB. The efficiency of conversion of solar energy into organic matter in the SCB has been estimated to be well under 1 percent (Eppley and Holm-Hansen 1986).

Environmental factors regulating growth lead to a complex spatial and temporal pattern of phytoplankton and productivity in the region. Every point in the water column is basically unique with regard to variables such as light intensity, nutrient mixture and concentration, and temperature. Small-scale biomass patchiness occurs even on scales of less than 1 meter (Hardy 1993). Physical factors of mixing and currents also determine the distribution of phytoplankton. Each species differs in its unique physiological requirements and optima for both light and nutrients. Topographic features of the SCB such as the complex of offshore islands and banks, which run from Santa Rosa and San Nicolas south to Tanner and Cortes banks, impose additional heterogeneity (Hardy 1993).

As is typical of the California coast, plankton abundance and primary production in the SCB are generally higher nearshore than offshore. Since the continental shelf is only a few kilometers wide, internal waves from deep water typically move shoreward, injecting nutrient-rich water onto the shelf area. Episodic sediment disturbance and suspension are important mechanisms of nutrient regeneration in the shallow nearshore area (Fanning *et al.* 1982). Significant differences in longshore abundances of phytoplankton species occurred between the north and south parts of the SCB. Out of 45 cases tested, 19 had greater abundances in the south (Cullen *et al.* 1982). Only three species had greater abundances to the north. In addition to horizontal patterns, the abundance of individual species, total biomass, and productivity of phytoplankton generally show marked differences vertically through the water column (Hardy 1993).

Temporal patterns can be divided into short-term "events" on a scale of hours, days, or a few months and longer term seasonal or recurring annual trends. Like other areas, the Channel Islands can experience blooms (dense growths and accumulations of phytoplankton). Short-term blooms of diatoms and other phytoplankton associated with upwelling events often occur in winter or spring and last for a few days to a few weeks. A typical year has three such blooms each lasting 5 to 6 weeks (Tont 1976). The variance in abundance of phytoplankton between bloom and non-bloom periods can be almost as great as the annual variation in abundance (Tont and Platt 1979).

In general, diatoms have several major peaks of abundance that are 5 to 6 weeks in duration, usually during the first half (but occasionally the latter half) of each summer (Tont 1976, 1981; Tont and Platt 1979). A high correlation in the occurrence of blooms was generally observed between San Diego and Port Hueneme, although the dominant species in the two locales were frequently different. The majority of these blooms occurred in conjunction with upwelling events. Sea surface temperature decreases of 2.5 degrees C indicating upwelling often were associated with diatom standing stock increases of four orders of magnitude (Hardy 1993).

The biomass of the larger diatoms tends to be maximum in late winter or spring although fall blooms also occur (Allen 1936). Large dinoflagellates tend to bloom in summer and slightly earlier at La Jolla than at Port Hueneme, but winter blooms are also known (Allen 1941). Unlike at La Jolla, phytoplankton densities at Port Hueneme show seasonal variations that exceed the variability on shorter time scales (Tont and Platt 1979).

Under certain oceanographic conditions, blooms are dense enough to alter the color of the water to red, yellow, green, or brown (Oguri *et al.* 1975). Although these blooms can be caused by different groups of organisms, including diatoms, they are most commonly caused by dinoflagellates (Hardy 1993). Although not related to the tidal cycle, blooms of red-pigmented dinoflagellates are called “red tide”. Red tides can occur in the Sanctuary almost any month of the year and are generally most pronounced nearshore (Oguri *et al.* 1975). Spring red tide blooms are dominated by *Prorocentrum micans* while the more intensive and frequent blooms during July through October are dominated by *Gonyaulax polyhedra* (Sweeney 1975).

Many phytoplankton can generate toxins, including *Pseudonitzschia australis*, a phytoplankton species found in the Santa Barbara channel. This diatom produces a neurotoxin called domoic acid. Elevated domoic acid levels in plankton have been linked to deaths of dolphins, sea lions, seabirds, and other marine mammals. By May of 2002, elevated domoic acid levels had led to 70 dolphin beachings and caused 200 sea lions and 200 seabirds to become sick or die (ProMed-mail 2003). During May of 2002, domoic acid was measured at up to 380 parts per million in mussels taken from Santa Barbara waters (ProMed-mail 2003). The federal alert level is 20 parts per million (ProMed-mail 2003). Research on plankton is currently investigating what triggers the algae growth and why different levels of toxins are produced at different times (ProMed-mail 2003).

1.2.1.2 Zooplankton

Zooplankton of the region comprise a large and diverse group of animals. This section will address the interrelationships between the distribution and abundance of these organisms and the oceanography that influences these distributions.

Roseler and Chelton (1987) summarized CalCOFI zooplankton data (displacement volumes) over a 32-year period from 1951 to 1982. They noted that non-seasonal zooplankton variability was dominated by very low-frequency patterns with periods of 3 to 5 years associated with variations in large-scale

equatorward transport of the California Current. Years when California Current flow was higher than normal were associated with larger zooplankton biomass of 3 to 4 months' duration.

McGowan *et al.* (1998) note that zooplankton biomass has declined over 70 percent in the central north Pacific ocean since the late 1970s in concert with increasing sea surface temperature. This interannual variable should be considered the baseline for understanding higher frequency events and processes, including biological interactions. These smaller scale, higher frequency processes include seasonal changes and localized events such as coastal upwelling, eddies, plumes, tidal oscillations, bottom processes, diel cycles, wind stress, and turbulence. The extent to which these physical events control or modify zooplankton ecology is a function of the particular organism, including its size, swimming ability, reproductive state, food needs, and other requirements (Dailey *et al.* 1993).

The three zones developed to describe zooplankton are harbor and bay, nearshore (shelf and shelf break), and offshore (open ocean and basins). The spatial distribution of the dominant zooplankton reflects the environmental characteristics of the zone's waters (Dailey *et al.* 1993).

The nearshore zone, which encompasses waters shoreward of the continental shelf slope break or approximately the 200-meter depth contour, is a useful demarcation for study of zooplankton since the water over the continental shelf tends to be an area of high productivity. This augmented region of productivity (Ryther 1969) is usually associated with increased vertical mixing and, thus, greater nutrient recycling and upwelling, both of which are wind-forced phenomena. The maintenance of a shelf zooplankton assemblage is largely dependent on the physical width of the shelf as well as on the frequency of offshore advection over the shelf.

Microzooplankton feed on particulate organic sources; they comprise protozoan as well as juvenile stages of larger zooplankton. Protozoans account for the greatest percentage of the microzooplankton numerically while the micrometazoans dominate the biomass (Beers and Stewart 1967, 1969a, b, 1970). Because of their high reproductive capacities relative to the metazoans, protozoans have a markedly more important effect on the dynamics of the pelagic trophic web. Since protozooplankton can reproduce by simple asexual binary fission, they are able to respond rapidly to a changing environment. In addition, because generally higher physiological rates are found among small organisms, they are considered by Beers (1986) to be among the most important pelagic herbivores, a role generally reserved for copepods in the past. Beers and Stewart (1969b, 1970) have shown that the biomass of the microzooplankton is generally 20 to 25 percent of the total larger macrozooplankton, both inshore and offshore in the SCB.

The macrozooplankton are a diverse group of animals composed of a number of major taxonomic categories. The medusae, ctenophores, and planktonic molluscs and tunicates are sometimes grouped into what is commonly termed gelatinous zooplankton. The chaetognaths (arrow worms) are important carnivorous zooplankters, but the majority of the zooplankton are made up of crustaceans, mostly copepods. Planktonic copepods are primarily calanoids. Of the calanoid copepods, *Acartia, Paracalanmus, Labidocera*, and *Calanus* are the most common genera collected nearshore in the SCB (Barnett and Jahn 1987).

Regarding offshore zooplankton, a number of investigators (Eppley *et al.* 1979) have maintained that for eastern boundary currents, including the California Current, wind-drive coastal upwelling is the main source of new nutrients entering the euphotic zone. Others (Reid 1962; Bernal and McGowan 1981; Roesler and Chelton 1987) have found a correlation between zooplankton biomass, cold water temperature, and increased flow of the California Current. Chelton *et al.* (1982) analyzed 30 years of CalCOFI data to identify factors that play dominant roles in California Current zooplankton biomass fluctuations. They compared the longshore component of wind stress with mean monthly zooplankton volumes and concluded that, while wind-induced upwelling may play some role in zooplankton

fluctuations, instead fluctuations are more related to changes in the transport of the California Current in the SCB.

Beers and Stewart (1969b) found a gradient of decreasing microzooplankton from onshore to offshore in the SCB. They also found an increasing concentration of microzooplankton relative to the concentration of chlorophyll-a with distance offshore, and suggested that the microzooplankton may play a more significant role in the offshore than in the nearshore realm.

Macrozooplankton of the offshore zone often are many of the same species as those found nearshore. In addition, more oceanic and deeper water species have been collected. Of the calanoid copepods, *Calanus, Pleuromanmma*, and *Metridia* are common offshore genera in the SCB (Dailey *et al.* 1993).

Although the SCB contains some unique species, it is largely a transition zone between subarctic, central, and equatorial species. Thus, biomass fluctuations may also be accompanied by changes in species composition. The boundary (or clinal region) between cold, nutrient-rich California Current water (and its associated subarctic species) can vary in position relative to warmer, nutrient-poor water from the south (equatorial water) and west (central water) (Dailey *et al.* 1993).

1.2.2 Macroalgae and Vascular Plants

The northern Channel Islands include a wide variety of marine plants due to its transitional location between cold- and warm-water bioregions and its diversity of coastal environments, ranging from sheltered embayments to exposed open coast mainland and island habitats (Abbott and Hollenberg 1976; Murray *et al.* 1980). Most marine macrophytes require hard substrate for attachment, and all need light for photosynthesis, thereby largely restricting their depth distribution to the upper 50 meters or less depending on water clarity. In the SCB, 492 species of algae and 4 species of seagrasses are known to occur out of the 673 species described for California in Abbott and Hollenberg (1976) (Murray and Bray 1993). Of the 492 species, 59 are green algae (Chlorophyta), 86 are brown algae (Phaeophyta), and 347 are red algae (Rhodophyta).

Knowledge of the distribution and abundance of marine plants in the SCB has expanded considerably since the mid-seventies, largely due to the quantitative intertidal surveys conducted by the BLM from 1975 to 1979 (Littler 1980; Littler *et al.* 1991). The results of these and other studies are summarized in Murray and Bray (1993). During the 1980s and 1990s, surveys by Channel Islands National Park, MMS, Tatman Foundation, and others focused on monitoring population dynamics of key species at representative regional sites (Dunaway *et al.* 1997). The University of California Santa Barbara (UCSB) has research projects targeting surfgrass (*Phyllospadix*) (Reed *et al.* unpublished data) and boa kelp (*Egregia*) (Blanchette *et al.* unpublished data). Most research on subtidal plants has concentrated on giant kelp forest communities (Foster and Schiel 1985). Much less is known about other subtidal macrophyte assemblages, despite the importance of plant-dominated habitats for a multitude of invertebrates and fishes. Reconnaissance and monitoring surveys focused on the islands have been carried out by CINP-KFMP (CINP 1982 to 1997) and the Tatman Foundation Channel Islands Research Program (CIRP 1980 to 1998). Subtidal eelgrass (*Zostera*) habitats at the islands were investigated recently for the California Coastal Commission (Engle *et al.* unpublished data).

Northern species are defined here as ranging northward from northern Baja California (at about Bahia del Rosario) into and often beyond the Oregonianbioregion. Southern species, on the other hand, range southward from central California (in the Monterey area) into and, less commonly, through the Californian bioregion. Transitional species are narrowly defined as endemics restricted to the region of overlap, *i.e.*, between northern Baja California and central California. Species classified as widespread range broadly along the coast between central Baja and northern California.

Species distributions from BLM surveys (Murray and Bray 1993) and more recent surveys support that the northern Channel Islands encompass the transition between southern, warm-water Californian flora and northern, cold-water Oregonian flora. The Channel Islands are particularly transitional, with each island having its own mix of southern versus northern species. Santa Barbara Island is most favored 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 with a greater portion of northern species. Intertidal algae surveyed along the mainland from Point Conception south to San Diego also show a north-south species gradient for the BLM program (Murray and Littler 1981). Three groupings were evident: (1) sites nearest Point Conception, (2) sites between the Santa Barbara Channel and Santa Monica Bay, and (3) sites between Los Angeles and San Diego.

No marine plants in the region are listed or proposed for listing under State or Federal programs for protecting species in danger of extinction. However, some species deserve special consideration because of their importance as keystone species, dominating ecosystems that are defined by their presence. Giant kelp, surfgrass, and eelgrass are described above.

Analyses of past studies indicate that marine plant diversity is greater in the SCB and the Channel Islands than the diversity associated with central California due to the greater variety of habitats present and to mixing of southern and northern species in the SCB. Murray *et al.* (1980) found that floral diversity in California was positively correlated with decreasing latitude; maximum richness (446 species) occurred between 33 degrees and 34 degrees north latitude.

1.2.2.1 Macroalgae

Algae include the macroscopic members of the plant divisions Chlorophyta (green algae), Phaeophyta (brown algae), and Rhodophyta (red algae), often referred to as seaweeds. The Channel Islands include a rich array of flora of benthic macroalgae and seagrasses. In shallow coastal habitats there is considerable variation in wave action, ocean water masses, thermal regimes, and substrata. The large coastal area and the degree of habitat heterogeny contribute to the great diversity of macrophytes documented for the SCB (Abbott and Hollenberg 1976; Murray *et al.* 1980).

A total of 492 species of algae occur in the SCB, including 59 species of Chlorophyta, 86 species of Phaeophyta, and 347 species of Rhodophyta, making the composition of the SCB seaweed flora 70.5 percent red, 17.5 percent brown, and 12 percent green (Murray and Bray 1993).

South of Point Conception, the flora tends to be dominated by shorter, more densely branched species of red algae instead of larger, fleshy forms (Abbott and Hollenberg 1976). Brown algae, especially those in the Order Dictyotales, also are more prominent in southern California subtidal habitats, replacing many of the bladed red algae common to the north.

Murray *et al.* (1980) suggested that the high diversity of SCB seaweed flora may be related to the greater amount of shoreline habitat found south of Point Conception and to the various exposures of island habitats to the warm and cold ocean currents prevalent in the SCB.

1.2.2.2 Giant Kelp (Macrocystis pyrifera)

See FEIS, Appendix C section 1.1.3 on kelp forest habitat above.

1.2.2.3 Seagrasses

See FEIS, Appendix C section 1.1.4 on surfgrass and eelgrass habitat above.

1.2.3 Invertebrates

Benthic invertebrates include species from nearly all phyla of invertebrates that live in (infauna) or on (epifauna) the sea floor during most of their lives. They may also be characterized as sessile (attached or sedentary) or motile (free-moving). Benthic invertebrates range in size from little known microscopic forms (microinvertebrates) to the more common larger organisms (macroinvertebrates). Most benthic invertebrates also have pelagic larvae. The Channel Islands are characterized by a wide variety of benthic invertebrates due to its transitional location between bioregions and its diversity of substrates. These 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 of benthic invertebrates may well be in excess of 5,000, not including microinvertebrates (Smith and Carlton 1975: Straughan and Klink 1980).

Macroinvertebrates have been studied to varying degrees in representative habitats throughout the region. Ecological relationships are best known for invertebrates from intertidal and shallow subtidal environments because of their accessibility. However, there has been relatively little emphasis in the past two decades on species inventories or compiling species information from various individual nearshore projects. More emphasis has been placed on monitoring population dynamics of key rocky intertidal and kelp forest species by government agencies such as CINP, MMS, CCC, and Santa Barbara County (Dunaway *et al.* 1997; Engle 1994; Engle *et al.* 1997).

A major source for regional species distributional data is the BLM baseline survey program conducted in 1975 to 1979, which included intertidal and deep-water (but not shallow-water) habitats. Straughan and Klink (1980) compiled a taxonomic listing of the common nearshore species from southern California as part of the BLM program, including approximately 300 cnidarians, 60 nemerteans, 575 polychaetes, 1,100 mollusks, 20 pycnogonids, 250 crustaceans, 5 stomatopods, 20 tanaids, 30 cumaceans, 125 isopods, 300 amphipods, 20 sipunculids, 10 echiurans, 150 echinoderms, and 50 ascidians. Other major sources for deepwater invertebrate species inventories include surveys for coastal waste treatment and other outfall monitoring programs and studies sponsored by MMS to evaluate possible impacts of offshore oil and gas operations. The Southern California Association of Marine Invertebrate Taxonomists (SCAMIT) compiled an extensive, standardized list of macro- and mega-invertebrates from SCB mainland soft-bottom habitats at depths from 10 to 300 meters (SCAMIT 1998). Although most of the species records were from outfall studies, other randomly sampled sites were included as part of the SCB Pilot Project (SCBPP) (Allen *et al.* 1998; Bergen *et al.* 1998). These largely unpublished data were compiled primarily from reconnaissance surveys at the Channel Islands during the 1980s and 1990s conducted by the Tatman Foundation CIRP. Other data were included from CINP, CCC, and MMS surveys. Records from the 1975 to 1978 BLM program were not included.

Species distributions from BLM surveys (Seapy and Littler 1980, 1993; Thompson *et al.* 1993) and more recent surveys confirm that the Channel Islands encompass the transition between southern and northern fauna. The Channel Islands are particularly transitional, with each island having its own mix of southern versus northern species. Although conditions are dynamic, the general pattern is that Santa Barbara Island is mostly composed of southern species, Anacapa and Santa Cruz Islands have both southern and northern components, while Santa Rosa and San Miguel Islands have northern species.

The white abalone, which was recently Federally listed as endangered, is the only invertebrate species currently listed under either State or Federal Endangered Species acts. In 1999 black abalone was listed as a candidate species for Federal listing (64 FR 33466). More recently, in 2008, black abalone was proposed for endangered status listing under the ESA (73 FR 1986). A number of invertebrate species deserve special consideration because of their importance as keystone dominants, harvested species, or species particularly sensitive to environmental impacts. These species are highlighted below.

1.2.3.1 Corals

California hydrocoral (*Stylaster californicus* [= *Allopora californica*]). Spectacular, but little known California hydrocoral colonies inhabit subtidal depths (known to 96 meters) from Vancouver Island (Canada) to central Baja California. Hydrocoral colonies occur on current-swept rocky reefs and pinnacles (Engle and Coyer 1981; Osterello 1973). These purple or pink-red hydrocorals resemble small branching tropical staghorn coral (to 53 centimeters). Sessile, filter-feeding adults produce planktonic larvae with limited dispersal. Slow-growing (approximately 0.8 centimeters per year) colonies may live well over 30 years. At least four obligate commensals are supported by the hydrocoral colonies: two polychaetes, one snail, and one barnacle (Osterello 1973; Wright and Woodwick 1997).

Since California hydrocoral keeps its color when dried, it has been commercially harvested in the past for sale in shell shops. The fishery is presently closed. The slow growth and limited dispersal of the California hydrocoral suggests that it may be particularly sensitive to disturbance and fishery pressure. Colony branches are easily broken by anchors, trawlers, and divers. California hydrocoral has no known predators (Osterello 1973). However, colonies are susceptible to overgrowth by algae or smothering by sediments (Morris *et al.* 1980; Osterello 1973; Thompson *et al.* 1993). California hydrocoral is rare, at least within scuba diving depths, and is especially rare in the Sanctuary. Here it is known from only a few deep, current-swept reefs at Santa Barbara, Santa Cruz, and San Miguel Islands (Engle unpublished data). Its abundance in deepwater is largely unknown although BLM surveys assessed abundances at Tanner and Cortes Banks, south of San Nicolas Island.

1.2.3.2 Ridgeback Prawn (*Sicyonia ingentis*)

Ridgeback prawns occur in subtidal depths (48 to 175 meters) from Monterey Bay to central Mexico. Preferred habitats are deep sand, shell, and mud substrates (Leet *et al.* 1992). These prawns are identified by a prominent ridge along the dorsal midline of the abdomen and a short rostrum. Adult prawns are relatively sedentary. The diet is not well known, though it is suspected to be a detritus feeder as are related prawns. This species may live about 5 years. A commercial fishery using trawling gear began in 1966. Landings decreased dramatically from 1985 to 1991 (population decline confirmed by Department surveys at that time), but have since increased to over 1.4 million pounds in 1999 (Leet *et al.* 1992, 2001; Thompson *et al.* 1993). Surveys by the Department confirmed population declines since 1985.

1.2.3.3 Spot Prawn (*Pandalus platyceros*)

Spot prawns occur in deep water (50- to 533-meters depth) from Alaska to San Diego. These prawns are reddish-brown with two prominent posterior white spots and 3 to 4 longitudinal white stripes on their carapace. They may be associated with hard or soft substrates. The diet of spot prawns consists of small crustaceans, plankton, mollusks, polychaetes, sponges, and carcasses (O'Clair and O'Clair 1998). This species may live for more than 6 years. A commercial fishery using trawling gear and traps began in the Channel Islands area in 1974 (Leet *et al.* 1992). State-wide landings increased steadily from 1984 to nearly 800,000 pounds in 1998 with a drop to 600,000 pounds in 1999 (Leet *et al.* 2001).

1.2.3.4 Spiny Lobster (*Panulirus interruptus*)

California spiny lobster inhabit low intertidal levels to subtidal depths (to 80 meters) from Monterey Bay to central Mexico, but they are rare north of Point Conception. These warm-water crustaceans are identified by their long antennae, reddish-brown color, and large size (to 60 centimeters). Juveniles (under 2 years) utilize shallow vegetated reefs, especially surfgrass beds as nursery habitats (Engle 1979). Adults inhabit crevices in rocky areas, from which they emerge at night to forage on a wide variety of invertebrates, including worms, mollusks, and sea urchins. Spiny lobsters may live 30 years or more

(Leet *et al.* 1992). Spiny lobsters occur at all of the Channel Islands, but are more abundant in those locations in the Californian Province and Transition Zone.

Spiny lobsters have been commercially harvested using traps in California for over 100 years. Most of the fishery is in water less than 30 meters deep although the fishery has expanded to include deeper habitats. A sport fishery (hand capture) is popular among scuba divers in the Channel Islands area. Other sources of mortality include predation by octopus and fishes. California spiny lobster populations have not been well studied; however, population levels appear to have been maintained by recruitment from Baja California facilitated by warm-water patterns over the past two decades (Engle 1994). Landings declined from 1950 to 1975, then increased coincident with establishment of escape ports for sublegal lobsters in traps and development of the long-term warming trend (Leet *et al.* 1992). During the 1990's landings generally ranged from 600,000 to 800,000 pounds with a peak of 950,000 pounds in 1998, then fell about 500,000 pounds in 1999. Landings in this fishery are strongly influenced by weather, oceanographic conditions and the export market (Leet *et al.* 2001).

1.2.3.5 Crabs

Crabs are primarily benthic arthropods of the Class Brachyura. There are many species, with varying ecological niches. Three major groups of crabs occur in the region, each with multiple species: spider, cancroid, and grapsoid crabs. Three species of cancroid crabs are of particular interest due to their commercial harvest.

Rock crabs: Brown rock crab (*Cancer antennarius*), yellow rock crab (*C. anthonyi*), and red rock crab (*C. productus*).

Rock crab species inhabit low intertidal levels to subtidal depths (less than 40 meters). The brown rock crab occurs from Washington to central Baja California. The yellow rock crab occurs from northern California to southern Baja California. The red rock crab occurs from Alaska to central Baja California. Yellow rock crabs prefer soft substrate habitats while brown and red rock crabs prefer rocky substrata. Rock crabs have smooth carapaces, dorsal shell colorations matching their name, and a yellow underside. Migration is unknown, though they range randomly over several kilometers. Rock crabs are predators (feeding on a wide variety of invertebrates) and scavengers. They may live about 6 years or more (Leet *et al.* 1992).

Large-scale commercial harvest of rock crabs using traps began in 1950. Santa Barbara and the Channel Islands represent major fishery areas. A minor sport fishery, using hoop nets and star traps, exists. Rock crab landings steadily increased through 1984 to over 2 million pounds and have since declined to 700,000 pounds in 1999 with some fluctuation (Leet *et al.* 2001). Other sources of mortality include predation by fishes, octopus, sea stars, and sea otters. Rock crab populations in the region have not specifically been assessed. However, experimental trapping has shown that catches are lower in commercially targeted areas (Gotshall and Laurent 1979; Leet *et al.* 1992; Morris *et al.* 1980).

1.2.3.6 Abalone

Seven species and one sub-species of abalone are found in the Channel Islands. All species are mollusks of the Family Haliotidae, genus *Haliotis*, which adhere with an enlarged foot to rocky substrata, and feed primarily on drift algae. Five species of abalone (black, green, pink, red, and white) were popular sport and commercial species until populations experienced severe declines during the 1980s and 1990s. These declines likely resulted from a combination of overharvest, disease (except for white abalone), and a long-term warming trend leading to poor recruitment coincident with enhanced storm activity, reduced kelp abundance, and increased competition with sea urchins (Leet *et al.* 1992; Engle 1994). The take of

abalone has been prohibited in California since 1996, except for sport take by free divers in northern California. Mariculture operations supply small red abalone for restaurants. One species, white abalone, has been listed as endangered and black abalone is proposed for endangered status listing under the Federal ESA. The five major species of abalone in the Channel Islands typically occupy different, but overlapping, depth ranges (Haaker *et al.* 1986). From intertidal to deepwater, dominant species are black, green, pink, red, and white abalone.

Black Abalone (Haliotis cracherodii)

Black abalone inhabit mid-low intertidal levels down to shallow subtidal depths (to 6 meters) from Oregon to southern Baja California (Morris *et al.* 1980). They are readily identified by dark, bluish-black coloration, a smooth shell with 5 to 7 open respiratory holes, and relatively small size (5 to 20 centimeters as adults). Black abalone are relatively sedentary and typically found clustered in wet crevices, under boulders, or on the walls of surge channels along exposed shores. Juveniles graze on diatom films and coralline algae while adults primarily eat drift algae, especially brown kelps. Black abalone compete with sea urchins and other crevice-dwellers for space and food (Miller and Lawrenz-Miller 1993; Taylor and Littler 1979). Where abundant, abalone may be stacked on top of each other, reaching densities of more than 100 per square meter (Douros 1987; Richards and Davis 1993). Black abalone are slow-growing and long-lived, with recruitment apparently being low and variable (Morris *et al.* 1980; VanBlaricom 1993). Growth rates depend on animal size, location, food availability, reproductive condition, and other factors. Absolute longevity has not been determined, but ages greater than 30 years appear likely based on tagging and other population studies (VanBlaricom 1993).

Although once an important fishery resource throughout the region, landings peaked in 1973 and declined thereafter (Leet *et al.* 1992). Sport and commercial black abalone fisheries have been closed since 1993. Black abalone populations in southern California suffered catastrophic declines since the mid-1980s that resulted in nearly complete disappearance of black abalone along mainland shores south of Point Purisima (Miller and Lawrence-Miller 1993; Carr 1989), as well as at many of the Channel Islands (Lafferty and Kuris 1993; Richards and Davis 1993). Mortality was associated with "withering syndrome" (WS), in which the foot shrinks and weakened individuals lose their grip on rock surfaces (Antonio *et al.* 2000; Friedman *et al.* 1997; Gardner *et al.* 1995). WS or its prokaryotic infection has been observed in abalone north of Point Conception in recent years; however the disease is not widespread (Altstatt *et al.* 1996). Overfishing also played a role in the population declines (CDFG 2002). Other sources of mortality include smothering by sand burial, dislodgment by storm waves, and predation by octopus, sea stars, fishes, and sea otters (Morris *et al.* 1980; VanBlaricom 1993). Impacts from oil are little known, but North *et al.* (1964) reported black abalone mortality following a spill in Baja California. Because of low recruitment, slow growth, and already reduced reproductive populations, additional mortality from oil spills would further inhibit recovery.

In January 2008, NMFS published a proposed rule (73 FR 1986) to list black abalone as endangered. After reviewing scientific and commercial information available, evaluating threats facing the species, and considering efforts being made to protect black abalone, NMFS concluded that the species is in danger of extinction throughout all of its range and proposes to list the species as endangered under the ESA. NMFS found that: the disease known as withering syndrome has spread to areas throughout the range of the species, has been responsible for the local extirpation of populations throughout a large part of the species' range, and threatens remaining black abalone populations; low adult densities below the critical threshold density required for successful fertilization exist throughout a large part of the species' range; and, a number of interacting factors (*e.g.*, suboptimal water temperatures, reduced genetic diversity, and illegal harvest) may further hamper natural recovery of the species. NMFS is considering a critical habitat designation, which could be subsequently proposed (73 FR 1986).

Green Abalone (Haliotis fulgens)

Green abalone inhabit low intertidal levels to subtidal depths (to 18 meters) from southern California to southern Baja California (Morris *et al.* 1980). These warm-water abalone are identified by lighter, olive-green to red-brown, shell coloration, a finely ribbed shell with 5 to 7 open holes, relatively small size (usually less than 20 centimeters), and a green and brown mottled foot. Green abalone are relatively sedentary and are commonly found in deep crevices exposed to strong wave action. Adult population density may depend on the availability of suitable crevice habitats. They feed almost exclusively on large drift algae. This species may live 20 years (Leet *et al.* 1992). Green abalone was an important fishery in California, with landings peaking in 1971 and rapidly declining thereafter (Leet *et al.* 1992). Green abalones were most common at the southern Channel Islands (including Santa Barbara Island) and present at the northern Channel Islands, but are now rarely encountered. The green abalone commercial and sport fishery is currently closed. Sources of mortality include predation by octopus, sea stars, fishes, and sea otters.

Pink Abalone (Haliotis corrugata)

Pink abalone inhabit subtidal depths (to 60 meters) from southern California to central Baja California (Morris *et al.* 1980). They are identified by lighter, green or red-brown shell coloration, an irregularly ribbed shell with 2 to 4 open holes, an arched shell with a scalloped margin, relatively small size (usually less than 17 centimeters), and their black and white mottled foot. Pink abalone are sedentary, occupying a permanent scar on a home rock. This species occurs in partially sheltered waters, infrequently dwelling in crevices. They feed almost exclusively on large drift algae. This species may live 20 years (Leet *et al.*1992).

In the early 1950s, pink abalone comprised the largest segment of the abalone fishery, about 75 percent, and had a significant effect on the total abalone landings. Commercial landings originated at the eastern northern Channel Islands (Anacapa, Santa Cruz), and the southern Channel Islands (San Nicolas, Santa Catalina, Santa Barbara, San Clemente). Because pink abalone are more fragile than others and grow more slowly, the high level of take could not continue (Leet *et al.* 2001). Department research cruises to San Clemente, Santa Catalina, and Santa Barbara Islands in 1996 and 1997, were used to investigate pink, and other, abalones. The number of abalones sighted per unit of time was used to quantify stocks, and a factor was applied to estimate the number of commercially legal pink abalone that could be collected per hour. Estimates ranged from about one to 1.5 abalone per hour. Similar cruises conducted in 1999, estimated only 0.28 commercial legal pink abalone per hour. At Catalina Island, no commercial sized pink abalone were found. Pink abalone has been on the NMFS Species of Concern list since 2004.

Red Abalone (Haliotis rufescens)

Red abalone inhabit low intertidal levels to subtidal depths (to 26 meters, rarely to 180 meters) from Oregon to southern Baja California (Morris *et al.* 1980). They are identified by brick red shell coloration, an irregular shell surface with 3 to 4 open holes, and relatively large size (to 30 centimeters). These colder-water abalone are relatively sedentary on reef tops or in crevices. They feed on drift algae and, especially when young, on microscopic algal films. This species may live 20 years (Leet *et al.* 1992).

Red abalone were previously an important fishery in California, with landings peaking in 1967 and steadily declining thereafter (Leet *et al.* 1992). In central and southern California, red abalone declined less than the other five species by the time the fishery was closed in 1997 (Leet *et al.* 2001). Combined landings of red abalone declined during the period from 1969 to 1982 stabilizing at 1/10 their historic average during the 14 year period before the 1997 closure (Leet *et al.* 2001). Detailed examination of catch by area and fishery independent assessments reveal that the stability in landings masked ongoing

reductions of local populations, as successive areas declined by over two orders of magnitude. From 1952 to 1968 most red abalone were caught in central California, followed by southern mainland, Santa Cruz, Santa Rosa and San Miguel Islands (Leet *et al.* 2001). Catches declined first along the central coast under the combined effects of expanding sea otters and fishing pressure. Outside the sea otter range catches declined more slowly along the southern mainland than at Santa Rosa, Santa Cruz, and San Nicolas Islands. From 1983-1996, catch decreased off these three islands to three percent, for Santa Rosa, and less than one percent, for Santa Cruz and San Nicolas, of their respective peak catches by the 1997 closure (Leet *et al.* 2001). San Miguel Island and the north coast were the exceptions to this pattern. Catches from San Miguel Island, the farthest and most northern of the Channel Islands, and the north coast comprised 71 of the 87 tons landed in 1996 prior to the fishery closure in 1997 (Leet *et al.* 2001). The red abalone commercial and sport fishery is currently closed, except for sport take by free divers in northern California. Other sources of mortality include predation by crabs, octopus, sea stars, fishes, and sea otters.

Currently, the California Fish and Game Commission is considering opening a limited red abalone fishery at San Miguel Island. An Abalone Advisory Group, an ad hoc group of constituent representatives appointed by the Fish and Game Commission, has been convened to discuss and develop management alternatives related to red abalone.

White Abalone (Haliotis sorenseni)

White abalone occur subtidally (about 20 to 65 meters) from southern California to southern Baja California. These deep-water abalone are readily identified by their red-brown shell color, a ribbed shell with 3 to 5 open holes, and a yellow-green and beige mottled foot. They grow to approximately 25 centimeters. Individuals up to about 25 years of age have been reported (Davis *et al.* 1996; Gotshall and Laurent 1979). White abalone are sedentary, inhabiting open, exposed deep-water reefs with a kelp understory. Adults consume drifting and attached macroalgae. Juveniles are cryptic, hiding in crevices and beneath rocks where they feed on microalgal films (Davis *et al.* 1996). The white abalone fishery developed late with the first reported commercial landings in 1968; however, they were popular because the foot meat is tender. Abundances were highest at the southern and northeastern Channel Islands. Peak landings occurred in 1972 and decreased thereafter (Leet *et al.* 1992). Average density during periods of peak harvest in the 1970s was one abalone per square meter. Density has dramatically decreased since to 0.002 per square meter (Carlton *et al.* 1999). Surveys in the Channel Islands area found that density may have further decreased to 0.0001 per square meter (Davis *et al.* 1998). Since females must be within a few meters of a male during spawning for fertilization to occur, present population densities in the area may preclude successful spawning. Some sections of the white abalone fishery have been closed since 1977 and the entire fishery has been closed since 1993, though densities have continued to fall (Carlton *et al.* 1999; Davis *et al.* 1998). Subthreshold breeding density and continued predation (*e.g.*, fish, octopus, and sea stars) suggest that recovery without significant human intervention is unlikely. Submersible surveys were carried out to further evaluate population status and to explore possibilities for collection of specimens for a captive breeding program. The rarity of this species prompted NMFS to list it as a candidate species under the Endangered Species Act in 1997. This action required a status review, which concluded that overexploitation was the major cause of the decline. Subsequently, in May 2000, the white abalone became the first marine invertebrate to receive Federal protection as an endangered species.

1.2.3.7 Limpets

Owl Limpet (Lottia gigantea)

Owl limpets are common in high and middle intertidal zones of exposed rocky shores from Washington south to Baja California. Adult *Lottia* are relatively easy to identify because of their large size (5 to 10

centimeters), oval shape with low rounded profile, and color patterns of brown, white, and black on the often eroded shell. Accessory gills on the mantle increase surface area for aerial respiration during low tide periods. Owl limpet habitats extend from the barnacle and *Endocladia* zones in the high intertidal zone down to the mussel beds in the mid tide zone. Owl limpets maintain feeding territories on relatively smooth rock surfaces which they keep free of (by rasping and bulldozing) most macroalgae and invertebrates (Stimpson 1970; Wright 1982). By removing most competitors they promote the growth of algal films upon which they systematically graze. These "clearings" vary in appearance with *Lottia* size and structural features of the substrate, creating a patchwork of differing microhabitats. *Lottia* tend to occupy one or more characteristic "home scars" within their territories. The limpets also may tuck into crevices and under mussels for protection from heat, desiccation, and high surf.

Lottia grow slowly, taking up to 10 to 15 years to reach maximum size (Morris *et al.* 1980). As an ecological dominant, any change in *Lottia* populations greatly affects abundances of other species. The limpets and their feeding territories are vulnerable to oiling, but oil impacts are unclear. For example, they were not obviously affected by the 1971 San Francisco oil spill (Chan 1973). Due to their slow growth, recovery from any major disturbance likely would be lengthy. Larger owl limpets are collected for food, tasting much like abalone (Murray 1998). Since the largest individuals are nearly always females (*Lottia* are protandrous hermaphrodites) (Wright and Lindberg 1982), collecting may impair reproductive capabilities within owl limpet populations.

1.2.3.8 Mussels, Clams, and Scallops

Mussels, clams, and scallops are mollusks of the Class Bivalvia. All bivalves have two hinged shells enclosing the rest of the animal. Bivalves feed by filtering particulate matter from sea water through their gills. They reside in or on the substrate as adults. Many species of bivalves occur in the Channel Islands area, with a sport fishery (for food or bait) being supported by the four species of particular interest described below plus others including purple clams (*Nuttallia nuttallii*), Washington clams (*Saxidomus nuttallii*), jacknife clams (*Tagelus californianus*), gapers (*Tresus nuttallii*), spiny cockles (*Trachycardium quadragenarium*), abalone jingles (*Pododesmus sepio*), oysters, San Diego scallops (*Pecten diegensis*), and speckled scallops (*Argopecten aequisulcatus*) (Thompson *et al.* 1993).

California Mussel (Mytilus californianus)

California mussels are abundant at middle to low levels of exposed rocky shores along the entire Pacific Coast. These 10- to 20-centimeter black/blue/gray mussels firmly attach to rocks or other mussels by tough byssal threads, forming dense patches or beds. The literature on *Mytilus californianus* is extensive, including key ecological studies on the effects of predation, grazing, and disturbance on succession and community structure (see for discussion Kinnetics 1992; Morris *et al.* 1980; Ricketts *et al.* 1985). The bay mussel, *M. galloprovincialis* (formerly mis-identified as *M. edulis*), can co-occur with *M. californianus*, but is most common in sheltered habitats.

Thick (20 centimeters or more) beds of California mussels trap water, sediment, and detritus that provide food and shelter for a large diversity of plants and animals, including cryptic forms inhabiting spaces between mussels as well as biota attached to mussel shells (Kanter 1980; MacGinitie and MacGinitie 1968; Paine 1966; Suchanek 1979). For example, MacGinitie and MacGinitie (1968) counted 625 mussels and 4,096 other invertebrates in a single 25 square centimeter clump, and Kanter (1980) identified 610 species of animals and 141 species of algae from mussel beds at the Channel Islands. Kinnetics (1992) documented location differences in the composition and abundance of mussel bed species. Northern sites had densely packed, multi-layered beds, but the more open southern sites had higher species diversity. Mussels feed on suspended detritus and plankton. Young mussels settle preferentially into existing beds at irregular intervals, grow at variable rates depending on environmental

conditions, and eventually reach ages of 8 years or more (Morris *et al.* 1980, Ricketts *et al.* 1985). Desiccation likely limits the upper extent of mussel beds, storms tear out various-sized mussel patches, and sea stars prey especially on lower zone mussels. Mussels are popularly harvested by sport collectors for food and bait. *Mytilus* are adversely affected by oil spills (Chan 1973; Foster *et al.* 1971). Recovery from disturbance varies from fairly rapid (if clearings are small and surrounded by mussels that can move in) to periods greater than 10 years (if clearings are large and recruitment is necessary for recolonization) (Kinnetics 1992; Vesco and Gillard 1980).

Pismo Clam (Tivela stultorum)

Pismo clams inhabit the intertidal zone to subtidal depths (to 25 meters, but mostly less than 7 meters) from Monterey to central Baja California. Adults are found along surf-swept sandy shores. Pismo clams are identified by light colored shell with fine concentric growth lines and short externally-visible siphons. Adult Pismo clams are buried in the substrate and are relatively sedentary. This species may live up to 50 years (Leet *et al.* 1992). Pismo clams have supported a commercial and sport fishery in California since at least 1916. Natural predators include sea stars, snails, fishes, birds, and sea otters. Natural populations of Pismo clams on the mainland have been studied by the Department since 1923. Pismo clams occur at two specific locations at the Channel Islands (at Santa Cruz and Santa Rosa Islands) (Dugan *et al.* 1993; Engle *et al.* 1998).

Geoduck (Panopea abrupta)

Geoducks inhabit low intertidal levels to subtidal depths (to 100 meters) from Alaska to central Baja California. Adults are found in the sandy mud of protected bays or in deep water soft substrates. Geoducks are identified by whitish shells with irregular concentric growth lines and a huge, externally visible siphon (to 1 meter long). Adult geoducks are buried in the substrate and are relatively sedentary. This species has an extremely long life span (up to 146 years) (O'Clair and O'Clair 1998). Geoducks support a modest sport fishery in California, with divers or individuals on the beach digging up the clams. Their great depth in the sediment requires the use of high-pressure water jets for harvest which seriously disturbs the substrate. Some have expressed interest in developing such a fishery in southern California, but there is also concern about quickly overharvesting such long-lived animals. Natural predators of the geoduck are not known (Morris *et al.* 1980; O'Clair and O'Clair 1998). Populations of the geoduck are found around all four of the northern Channel Islands and along the coast south of Point Conception (Engle *et al.* 1998).

Rock Scallop (Crassedoma giganteum [= Hinnites giganteus])

Rock scallops inhabit low intertidal levels to subtidal depths (to 50 meters) from British Columbia (Canada) to central Baja California. In the Channel Islands, adults are found primarily on high-relief rocky reefs, pinnacles, and walls with moderate to high water motion. Rock scallops are identified by yellow-orange shell, orange flesh, blue eyes on tentacles at edge of mantle, and lack of a visible external siphon. The shell is frequently covered with fouling organisms. Adult rock scallops are attached to the substrate; post-larval juveniles (larger than 45 mm) can swim limited distances. This species may live up to 25 years (Leet *et al.* 1992). Rock scallops support a popular sport fishery for their tasty adductor muscle. It is difficult to assess the total fishery harvest of rock scallops, but nearly 1,000 were reported taken each year between 1978 and 1987 by divers aboard CPFVs, mostly at the Channel Islands (Leet *et al.* 2001). The sport fishery appears to have depleted some local populations. Known natural predators include sea stars although there are likely others. Populations of the rock scallop have not been well studied (Leet *et al.* 1992; Morris *et al.* 1980).

Market Squid (Loligo opalescens)

The California market squid occurs off southern Alaska to central Baja California. They inhabit pelagic coastal waters, congregating to spawn in semi-protected bays, usually over a sand bottom with rocky outcroppings. Spawning in the Channel Islands often occurs from October through May. The average age of squid from fishery samples is approximately 185 days old (Leet *et al.* 2001). Eggs are deposited on the bottom in clusters, with juveniles emerging within approximately one month. Adults die after spawning. The diet of squid consists of small pelagic crustaceans, fishes, benthic worms, and their own young. Market squid have been harvested in California since 1863. The California fishery shifted its emphasis to the region in1961, where it is currently centered. The fishery has been marked by large-scale fluctuations in landings, with no apparent overall trend. Squid landings decrease greatly during strong el Nino events. Squid are harvested using strong lights over the water to attract schools of squid in relatively shallow spawning areas. Since 1984 squid landings have increased steadily to over 200 million pounds in 1999 with severe declines in 1992 and 1998 during strong El Nino events (Leet *et al.* 2001). The present status or structure of populations in the region is unclear and is presently being evaluated by the Department. However, historical evidence from research surveys and recent landing data indicate that the biomass is large (Leet *et al.* 2001).

Squid are important prey for numerous fishes, birds, and marine mammals and their eggs are eaten by benthic echinoderms (Morris *et al.* 1980, Leet *et al.* 1992). The market squid is one of the principal items of the diet of Dall's porpoise and Risso's dolphins, pilot whales, sea lions, and elephant seals (Bonnell and Dailey 1993). Overall, squid are an important part of many food webs in the SCB (Leet *et al.*1992).

1.2.3.9 Sea Urchins

Sea urchins are benthic grazers relying on their outer covering of spines and tube feet for locomotion and protection. Five principal species occur within the Channel Islands: red, purple, white, coronado, and pink. The nocturnal, invertebrate-grazing coronado urchin (*Centrostephanus coronatus*) is a tropical species that reaches its northern limit at the Channel Islands. The pink urchin (*Allocentrotus fragilis*) occurs primarily on soft substrates at depths greater than 150 meters. Pink urchins are scavengers and often dominate the community in terms of biomass (Blake *et al.* 1996). The other urchins are major consumers of kelps and other algae. Red and purple urchins dwell in crevices and feed on drift kelp or emerge to consume attached plants (Morris *et al.* 1980; Leet *et al.* 1992). Urchin grazing may denude entire reefs of nearly all macroalgae, after which the urchins are capable of persisting in a near-starvation state, continuing to eat any newly settled plants (Ambrose *et al.* 1993; Carroll *et al.* 2000; Engle 1994; Harold and Reed 1985; Richards *et al.* 1997). These urchin barrens no longer support the highly diverse assemblages characteristic of balanced kelp-dominated ecosystems. Red, purple, and white urchins are susceptible to disturbance from major storms and a poorly understood disease that may dramatically reduce population sizes (Ebeling *et al.* 1985; Lafferty and Kushner 2000).

Red Urchin (Strongylocentrotus franciscanus)

Red urchins inhabit low intertidal to subtidal depths (to 90 meters) from Alaska to central Baja California. They prefer open rocky shores. Red urchins are identified by their red, maroon, or black color and large size (10 centimeters commonly, to 20 centimeters) (Leet *et al.* 1992; Morris *et al.* 1980). When food is abundant, red urchins are relatively sedentary. However, when food is scarce, red urchin motility increases (to 1 meter per day) (Harrold and Reed 1985). Red urchin spines are refuges for a variety of small invertebrates (including juvenile red urchins) and fishes (Tegner and Dayton 1977). The diet of red urchins consists of a variety of red and brown algae, but Giant kelp is preferred. Red urchins compete with abalone for food and space, though their spine canopy provides shelter for smaller abalone. Red urchins may live 20 years or more (Morris *et al.* 1980). A significant commercial fishery for red urchin

began during the 1970s in the region (Leet *et al.* 1992). Commercial hookah divers harvest red urchins using rakes at depths of up to 33 meters.

The relative abundance of red urchins has declined since the 1970's (*e.g.*, Carroll *et al.* 2000). In southern California, the red sea urchin resource now produces about 10 million pounds annually, with harvestable stocks (defined as exceeding the minimum legal size and containing marketable gonads) in decline since 1990 (Leet *et al.* 2001). Between 1985 and 1995, the percentage of legal-sized red sea urchins at survey sites in the northern Channel Islands declined from 15 percent to 7.2 percent (Leet *et al.* 2001). Although fishing has significantly reduced density in many areas and catch-per-unit of effort has decreased, localized juvenile recruitment has, thus far, somewhat mitigated fishing pressure (Leet *et al.* 2001). Consistent recruitment has been noted on artificial settlement substrates and along subtidal transects over the last decade at monitoring stations along the southern California mainland coast and the northern Channel Islands (Leet *et al.* 2001). This may be partly due to ocean current patterns in the SCB, where water retention may increase the chances for larvae to encounter habitat suitable for settlement. Continued recruitment at present levels, however, is not guaranteed; in fact, intensive sea urchin harvesting in northern California and Baja California could result in a decrease in sea urchin larvae in southern California in the future. Other sources of mortality include predation by sea stars, fishes, lobsters, and sea otters (Leet *et al.* 1992; Tegner and Dayton 1981; Tegner and Levin 1983; Rogers-Bennett 1998).

Purple Urchin (Strongylocentrotus purpuratus)

Purple urchins inhabit low intertidal to subtidal depths (to 160 meters) from southern British Columbia (Canada) to central Baja California. They prefer rocky habitats with moderate to strong wave action, where they normally inhabit crevices or depressions they create. Purple urchins are identified by their purple color and relatively small size (to 8 cm). The diet of purple urchins consists of a variety of red and brown algae, but giant kelp is preferred. They are relatively sedentary when food is abundant, with motility increasing as food availability decreases (to 1 meter per day) (Harrold and Reed 1985). This species may live at least 30 years (Morris *et al.* 1980).

Coincident with the decline of competing red urchins, purple urchins populations have increased tremendously at many island sites, creating vast areas denuded of macroalgae (Harold and Reed 1985; Ambrose *et al.* 1993; Engle 1994; Richards *et al.* 1997; Carroll *et al.* 2000, Lafferty and Kushner 2000). A small fishery has existed sporadically for this species which peaked in 1992 at 400,000 pounds and then declined to less than 50,000 pounds in 1999 (Leet *et al.* 2001). A limited amount of this harvest has come from the Channel Islands.

White Urchin (Lytechinus anamesus)

White urchins inhabit subtidal depths (2 to 300 meters) from the Channel Islands to central Baja California. They prefer soft substrates where they often occur in high densities. They can be one of the most dominant megafaunal species on deep-water mainland shelves (Thompson *et al.* 1993). They also periodically invade some shallow-water sand and rock habitats (Ambrose *et al.* 1993; Engle 1994; Richards *et al.* 1997; Carroll *et al.* 2000). White urchins are identified by their whitish color, small size (to 4 cm), and fragile test. White urchins are extremely effective grazers, capable of consuming kelp and other algae when density is high (Morris *et al.* 1980; Ambrose *et al.* 1993; Engle 1994; Richards *et al.* 1997; Carroll *et al.* 2000). In the Channel Islands, feeding fronts of white urchins apparently have eliminated eelgrass beds on the north side of Anacapa Island (Engle 1994). White urchins may also consume invertebrates, including other urchins (Coyer *et al.* 1987). There is no fishery for these small urchins. Predators of white urchins include sea stars and fishes (Schroeter *et al.* 1983).

1.2.3.10 Sea Cucumbers

Sea cucumbers are benthic animals with a variety of feeding strategies, from planktivory to bottom feeding (Morris *et al.* 1980). At least 12 species are known to occur in the Channel Islands though two (California and Warty sea cucumbers) are of particular interest as they support an expanding commercial fishery which began in 1978 and peaked in 1998 at nearly 900,00 pounds (Leet *et al.* 2001). It is apparent that harvesting has significantly reduced some sea cucumber populations.

California Sea Cucumber (Parastichopus californicus)

California sea cucumbers inhabit low intertidal levels to subtidal depths (to 90 meters) from Alaska to central Baja California; however, they rarely occur at depths above 30 meters in the region. Here, they occur predominantly on deep-water, soft-bottom habitats. These colder-water sea cucumbers are identified by their red, brown, or yellow color, large stiff papillae, and large size (to 40 centimeters). Although relatively sedentary, they may move up to 4 meters per day (Lambert 1997). The diet of California sea cucumbers consists of detritus and small organisms, which they ingest with bottom sediments. No sport fishery for this species exists. A commercial fishery using trawl gear for California sea cucumbers started in California in 1978 and dominated total sea cucumber landings until 1996 (Leet *et al.* 2001). In 1982, the center of the fishery shifted to the CINMS where they are harvested from the Santa Barbara Channel by trawling. This species may live about 12 years. (Morris *et al.* 1980; Leet *et al.* 1992). Sources of mortality other than fishing include predation by sea stars, fishes, and crabs.

Warty Sea Cucumber (Parastichopus parvimensis)

Warty sea cucumbers inhabit low intertidal levels to subtidal depths (to 27 meters) from Monterey Bay to central Baja California. These warmer-water sea cucumbers are common on both soft substrates and rocky reefs. Warty sea cucumbers are identified by their light-brown color, dorsal papillae, and smaller size than the California sea cucumber (to 25 centimeters). Warty sea cucumbers are common in the Channel Islands, though natural populations are poorly studied (Gotshall and Laurent 1979; Morris *et al.* 1980). This slow-moving sea cucumber feeds on detritus and small organisms, which it ingests with bottom sediments. It may live about 12 years (Morris *et al.* 1980; Leet *et al.* 1992). No sport fishery for this species exists. A commercial fishery by hookah divers using rakes started in California in 1978 (Leet *et al.* 1992). Initially, total sea cucumber landings were dominated by the trawl caught California sea cucumber, but since 1997 the total landings have been consisted of over 80 percent of the diver caught Warty sea cucumbers (Leet *et al.* 2001). Other sources of mortality include predation by sea stars, fishes, crabs, and sea otters, and a bacterial disease that may significantly reduce population sizes (Eckert *et al.* 2000; Engle 1994).

Ochre Sea Star (Pisaster ochraceus)

Ochre sea stars are found on middle and low tide levels of wave-swept rocky coasts from Alaska to Baja California, but they are much less common south of Point Conception. Their relatively large size (to 45 centimeters diameter), variety of colors (yellow, orange, purple, brown), and ability to withstand air exposure (at least 8 hours) attract considerable attention from visitors exploring the shore at low tide. The ochre sea star typically is associated with mussels, which constitute its chief food, but barnacles, limpets, snails, and chitons also may be taken (Morris *et al.* 1980).

Predator-prey interactions involving ochre sea stars have been intensely studied, especially the role of *P. ochraceus* in determining the lower limit of northern mussel beds (Dayton 1971; Paine 1966, 1974). Like black abalone, ochre sea stars are relatively slow-growing, long-lived, and apparently variable in recruitment success. Tolerant of high surf, they use their numerous tube feet to remain firmly in place,

often in cracks and crevices. They have few predators, except for the occasional sea gull or sea otter and curious tidepool visitor. However, in southern California, *P. ochraceus* populations have been decimated by a widespread wasting disease caused by a warm-water bacterium of the genus Vibrio (Eckert *et al.* 2000). Sensitivity to oil spills is not well known; Chan (1973) saw no obvious effects from a San Francisco oil spill. Due to their slow growth and low reproductive success recovery time from any major population loss likely would be very long.

1.2.4 Fishes

About 481 species of fish inhabit the SCB (Cross and Allen 1993). The great diversity of species in the area occurs for several 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 that include 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 that occur along the southern California coast, with the addition of some central California species (Hubbs 1974). Eschemeyer *et al.* (1983) list 406 fish species whose ranges include the CINMS (see Table C-2).

Table C-2. Common Fish Species Found in the CINMS

Common Name	Scientific Name
Albacore	*Thunnus alalunga*
Anchovy, Northern	*Engraulis mordax*
Barracuda, Pacific	*Sphyraena argentea*
Bass, Barred Sand	*Paralabrax nebulifer*
Bass, Giant Sea	*Stereolepis gigas*
Bass, Kelp	*Paralabrax clathratus*
Bass, Spotted Sand	*Paralabrax maculatofasciatus*
Bat Ray	*Myliobatis californica*
Blacksmith	*Chromis punctipinnis*
Bonito, Pacific	*Sarda chiliensis*
Brown Smoothhound	*Mustelus henlei*
Butterfish, Pacific	*Peprilus simillimus*
Ca. Scorpionfish (Sculpin)	*Scorpaena guttata*
Cabezon	*Scorpaenichthysm marmuratus*
California Sheephead	*Semicossyphus pulcher*
California Moray	*Gymnothorax nordax*
California Scorpionfish	*Scorpaena guttata*
California Flyingfish	*Cypelurus californicus*
California Halibut	*Paralichthys californicus*
Croaker, White	*Genyonemus lineatus*
Croaker, Black	*Cheilotrema saturnum*

Table C-2, Page 1 of 4

Table C-2. Common Fish Species Found in the CINMS (Continued)

Common Name	Scientific Name
Croaker, Yellowfin	*Umbrina roncador*
Eel, Monkeyface	*Cebidichthys violaceus*
Garibaldi	*Hypsypops rubicundus*
Goby, Bluebanded	*Lythrypnus dalli*
Goby, Blackeye	*Coryphopterus nicholsi*
Goby, Zebra	*Lythryphus zebra*
Greenling, Kelp	*Hexagrammos decagrammus*
Greenling, Painted	*Oxylebius pictus*
Greenling, Rock	*Hexagrammos lagocephalus*
Grunion	*Leuresthes tenuis*
Gunnel, Kelp	*Ulvicola sanctaerosae*
Hake, Pacific	*Merluccius Productus*
Half Moon	*Medialuna californiensis*
Horn Shark	*Heterodontus francisci*
Jacksmelt	*Atherinops californiensis*
Kelpfish, Island	*Alloclinus holderi*
Kelpfish, Crevice	*Gibbonsia montereyensis*
Kelpfish, Giant	*Heterostichus rostratus*
Kelpfish, Spotted	*Gibbonsia elegans*
Lingcod	*Ophiodon elongatus*
Mackerel, Pacific	*Scomber japonicus*
Mackerel, Jack	*Trachurus symmetricus*
Northern Ronquil	*Ronquilus Jordani*
Ocean Sunfish	*Mola mola*
Opah	*Lampris guttatus*
Opaleye	*Girella nigricans*
Orangethroat Pikeblenny	*Chaenopsis alepidota*
Queenfish	*Seriphus politus*
Reef Perch	*Micrometrus aurora*
Rock Wrasse	*Halichoeres semicinctus*
Rockfish, Gopher	*Sebastes carnatus*
Rockfish, Yellowtail	*Sebastes flavidus*
Rockfish, Black	*Sebastes melanops*
Rockfish, Black and Yellow	*Sebastes chrysomelas*
Rockfish, Blue	*Sebastes mystinus*

Table C-2, Page 2 of 4

Table C-2. Common Fish Species Found in the CINMS (Continued)

Common Name	Scientific Name
Rockfish, Bocaccio	*Sebastes paucispinis*
Rockfish, Brown	*Sebastes auriculatus*
Rockfish, Calico	*Sebastes dalli*
Rockfish, Canary	*Sebastes pinniger*
Rockfish, China	*Sebastes nebulosus*
Rockfish, Copper	*Sebastes caurinus*
Rockfish, Vermillion	*Sebastes miniatus*
Rockfish, Grass	*Sebastes rastrelliger*
Rockfish, Halfbanded	*Sebastes semicinctus*
Rockfish, Kelp	*Sebastes atrovirens*
Rockfish, Olive	*Sebastes serranoides*
Rockfish, Rosy	*Sebastes rosaceus*
Rockfish, Stripetail	*Sebastes saxicola*
Rockfish, Tree	*Sebastes serriceps*
Rockfish, Yelloweye	*Sebastes rubervimus*
Rockfish,Tiger	*Sebastes nigrocinctus*
Ronquil, Stripedfin	*Rathbunella hypoplecta*
Salmon, King	*Oncorhynchus Tshawytscha*
Sanddab, Pacific	*Citharicthys sordidus*
Sanddab, Speckled	*Citharicthys stigmaeus*
Sarcastic Fringehead	*Neoclinux blanchardi*
Sardine, Pacific	*Sardinops sagax*
Sargo	*Anisotremus davidsoni*
Saury, Pacific	*Coloabis saira*
Sculpin, Snubnose	*Orthonopias Triacis*
Sculpin, Scalyhead	*Artedius harringtoni*
Sculpin, Wooly	*Clinocotius analis*
Seaperch, Sharpnose	*Phanerodon atripes*
Seaperch, Striped	*Embiotoca lateralis*
Seaperch, Rubberlip	*Rhacochilus toxotes*
Seaperch, Rainbow	*Hypsurus caryi*
Señorita	*Oxyjulis californuca*
Shark, Blue	*Prionace glauca*
Shark, Mako	*Isurus oxyrnchus*
Shark, Soupfin	*Galeorhinus galeus*

Table C-2, Page 3 of 4

Table C-2. Common Fish Species Found in the CINMS (Continued)

Common Name	Scientific Name
Shark, Spiny Dogfish	*Squalus acanthias*
Shark, Swell	*Cephaloscyllium ventriosum*
Shark, Thresher	*Alopias vulpinus*
Shark, White	*Carcharodon carcharias*
Shark, Leopard	*Triakis semifasciata*
Siversides	*Atherinidae*
Sole, Sand	*Psettichthys melanostictus*
Sole, English	*Pleuronectes vetulus*
Sole, Rock	*Pleuronectes bilineatus*
Spotted Cusk-eel	*Chilara taylori*
Spotted Turbot	*Pleuronichthys ritteri*
Surfperch, Barred	*Amphistichus argenteus*
Surfperch, Black	*Embiotoca jacksoni*
Surfperch, Island	*Cymatogaster gracilis*
Surfperch, Kelp	*Brachyistius frenatus*
Surfperch, Pile	*Damalichthys vacca*
Surfperch, Pink	*Zalembius rosaceus*
Surfperch, Shiner	*Cymatogaster aggregata*
Surfperch, Spotfin	*Hyperprosopon anale*
Surfperch, Calico	*Amphistichus koelzi*
Surfperch, White	*Phanerodon furcatus*
Surfperch, Walleye	*Hyperprosopon argenteum*
Swordfish	*Xiphias gladius*
Thornback	*Platyrhinoidis triseriata*
Topsmelt	*Atherinops affinis*
Tube Snout	*Aulorhynchus flavidus*
Turbot, Hornyhead	*Pleuronichthys verticallis*
Turbot, Curlfin	*Pleuronichthys decurrens*
Turbot, C-O	*Pleuronichthys coenosus*
White Sea Bass	*Atractoscion nobilis*
Whitespotted Greenling	*Hexagrammos stelleri*
Yellowfin Fringehead	*Neoclinus stephensae*
Zebra Perch	*Hermosilla azurea*

Table C-2, Page 4 of 4
Source: CDFG 2002.

1.2.4.1 Nearshore Fish

Abundance of fish assemblages is greater at the northern Channel Islands than at nearby coastal regions of the southern California mainland. One reason for this is the high quality of nearshore habitats associated with the northern Channel Islands.

Fish abundance on nearshore reefs is related to the presence or absence of kelp and substrate topography. The abundance of water column fish such as kelp surfperch (*Brachyistius frenatus*), kelp bass (*Paralabrax clathratus*), giant kelpfish (*Heterostichus rostratus*), and kelp rockfish (*Sebastes atrovirens*) are directly correlated with kelp density. Kelp beds are not important spawning areas for fish, but they are important nursery areas for juvenile fishes. Juvenile and adult kelp bass occur in both kelp beds and on rocky reefs devoid of kelp (Cross and Allen 1993).

Hard substrates are the least abundant, but among the most important of fish habitats in the SCB (Cross and Allen 1993). About 30 percent of the species and 40 percent of fish families in the SCB occupy this habitat (Cross and Allen 1993). The composition of reef fish assemblages is influenced by the physical characteristics of the reef (Ebeling *et al.* 1980a,b; Larson and DeMartini 1984), and by water temperatures (Stephens and Zerba 1981; Stephens *et al.* 1984). Shelter-seeking species such as blacksmith (*Chromis punctipinnis*), garibaldi (*Hypsopops rubicundus*), grass rockfish, (*Sebastes rastrelliger*) brown rockfish (Sebastes *auriculatus*) and gopher rockfish (*Sebastes carnatus*) are abundant on high-relief reefs, but they are rare or absent on low-relief reefs (Larson and DeMartini 1984).

In the northern SCB, the kelp canopy is dominated by plankton-eating and kelp-browsing species such as blacksmith, kelp surfperch, blue rockfish (*Sebastes mystinus*) juvenile olive rockfish and senorita (Ebeling *et al.* 1980 a, b). The canopy assemblage is made up of large populations of just a few species of fish (Cross and Allen 1993). The most common, conspicuous fish in the canopies of kelp beds on high-relief bench reefs off Santa Barbara and Santa Cruz Island are blue rockfish (41 percent) and kelp surfperch (35 percent) respectively (Ebeling *et al.* 1980a). Blacksmith represent 36 and 33 percent of the assemblages at these locations, respectively. Fish that ambush their prey or graze, such as pile surfperch, (*Damalicthys vacca*) black surfperch, garibaldi, California sheephead (*Semicossphylus pulcher*) gopher rockfish (*Sebastes carnautus*) and black-and-yellow rockfish (*Sebastes chrysomelas*) occupy the reef itself. The kelp bed bottom assemblages consist of smaller populations of a relatively larger number of fish species. The most common fishes near the bottom of the Santa Barbara kelp bed are black surfperch (28 percent); at Santa Cruz Island, kelp bass (14 percent).

The rocky intertidal is a turbulent and dynamic environment where fish must cope with waves, surge and physiological stresses imposed by the ebb and flow of tides. Only six species of fish reside in the rocky intertidal including wooly sculpin (*Clinocotus analis*), reef finspot (*Paraclinus integripinnis*), rockpool blenny (*Hypsoblennius gilberti*), spotted kelpfish (*Gibbonsi elegans*), and California clingfish (*Gobiesox rhesssodon*) (Cross and Allen 1993).

1.2.4.2 Skates and Rays

Skates and rays are not specifically sought by commercial fishermen, but are taken incidentally, primarily by bottom trawlers in central and northern California waters (Leet *et al.* 2001). Of the species identified in the commercial catch the most common are the shovelnose guitarfish (*Rhinobatos productus*), bat ray (*Myliobatis californica*), big skate (*Raja binoculata*), and thornback (*Platyrhinoidis triseriata*). This does not represent the true catch composition, however, as 98 percent of the landings are listed as "unidentified skate" (Leet *et al.* 2001). A few nearshore species, most commonly the bat ray and shovelnose guitarfish, are the target of small sport fisheries.

Rays and skates occur in all marine habitats, from protected bays and estuaries to open seas, ranging from the surface to 9,500 feet deep (Leet *et al.* 2001). While some species are common, others are known from only a few specimens. From 1916 to 1990, skate landings, which ranged from 36,247 pounds (1916) to 631,240 pounds (1981), comprised two to 90 percent of the total elasmobranch catch (11.8 percent average) (Leet *et al.* 2001). Like the shark fishery, which had peaks from 1937 to 1948, and more recently from 1976 to 1990, the skate catch has fluctuated widely during the last half century (Leet *et al.* 2001). In the past 10 years, however, skate and ray landings have increased nearly ten-fold in California, from around 228,566 pounds in 1989 to 1,912,695 pounds in 1999 (Leet *et al.* 2001). This trend is most notable in the trawl fishery after 1994.

Some of the apparent increase may be due to increased landings of previously discarded catch. In 1994, the commercial groundfish fishery was divided into limited entry and open access components, each with new regulations and quotas. Groundfish quotas for both components were significantly reduced in the period from 1994 through 1999, leaving more space in the boats' holds for non-quota species. Trawl vessels may have supplemented their groundfish landings with skate and ray bycatch. There is considerable uncertainty whether the total impact on the skate and ray resource has increased or if more of the catch is being retained and landed (Leet *et al.* 2001).

The impact of sport fisheries on skates and rays is relatively unknown. Data from 48 shark derbies in Elkhorn Slough from 1950 to 1990 show, however, that shovelnose guitarfish, which in the 1950s and 1960s were the second, and in some years the most abundantly caught elasmobranch, virtually disappeared from the catch in later years (Leet *et al.* 2001). In the 1990s, there was a two-thirds decrease in the catch-per-unit effort for bat rays compared to the 1950s catch rates in these derbies (Leet *et al.* 2001). MRFSS data, however, show continued catches of bat rays, big skates, shovelnose guitarfish, and thornback. The total numbers caught are hard to determine from the numbers of sampled skates and rays, as sampled catch numbers vary widely from year to year (Leet *et al.* 2001).

Based on existing data, little can be said about the current or past population levels of California's skates and rays (Leet *et al.* 2001). While landings are increasing dramatically, this may or may not reflect an actual threat to the resource. Fish that were discarded in the past, dead and alive, are now being retained and landed. Other regions have already witnessed decreases in skate and ray populations and the population status warrants close monitoring.

1.2.4.3 Nearshore Epipelagic Species

Nearshore epipelagic fishes found within the CINMS include California barracuda *(Sphyraena argentea)*, Pacific bonito *(Sarda chiliensis)*, white seabass *(Sarda chiliensis)* and yellowtail *(Seriola lalandi)*. More information about these species can be found in Marine Protected Areas in NOAA's Channel Islands National Marine Sanctuary – Final Environmental Document (2002), available on line at http://www.dfg.ca.gov/mrd/ci_ceqa/index.html.

1.2.4.4 Groundfish

Groundfish species found within the CINMS include bocaccio *(Sebastes paucispinis)*, cowcod *(Sebastes levis)*, chilipepper *(Sebastes goodei)*, widow rockfish *(Sebastes entomelas)*, bank rockfish *(Sebastes rufus)*, dover sole *(Microstomus pacificus)*, English sole *(Pleuronectes vetulus)* and sablefish *(Anoplopoma fimbria)*. More information about these species can be found in Marine Protected Areas in NOAA's Channel Islands National Marine Sanctuary – Final Environmental Document (2002), available on line at http://www.dfg.ca.gov/mrd/ci_ceqa/index.html.

1.2.4.5 Coastal Pelagic Species (CPS)

Coastal pelagic species found within the CINMS include Pacific sardine *(Sardinops sajax)*, Northern anchovy *(Engraulis mordax)*, Pacific mackerel *(Scomber japonicus)* and jack mackerel *(Trachurus symmetricus)*. More information about these species can be found in Marine Protected Areas in NOAA's Channel Islands National Marine Sanctuary – Final Environmental Document (2002), available on line at http://www.dfg.ca.gov/mrd/ci_ceqa/index.html.

1.2.4.6 Highly Migratory Species

Highly migratory fish species found within the CINMS region include albacore *(Thunnus alalunga)*, swordfish *(Xiphias gladius)*, Pacific northern bluefin tuna *(Thunnus orientalis)*, skipjack tuna *(Katsuwonus pelamis)*, yellowfin tuna *(Thunnus albacares)*, striped marlin *(Tetrapturus audax)*, shortfin mako shark *(Isurus oxyrinchus)*, thresher shark *(Alopias vulpinus)*, blue shark *(Prionace glauca)*, opah *(Lampris guttatus)*, louvar *(Luvarus imperialis)* and dolphin *(Coryphaena hippurus)*. More information about these species can be found in Marine Protected Areas in NOAA's Channel Islands National Marine Sanctuary – Final Environmental Document (2002), available on line at http://www.dfg.ca.gov/mrd/ci_ceqa/index.html.

Regional upwelling carries nutrient-rich waters from canyons and island shelf areas to the photic zone resulting in increased primary productivity and larger zooplankton populations, which support exceptionally abundant populations of small schooling species such as the northern anchovy, Pacific saury (*Cololabis saira*), Pacific sardine, and Pacific and jack mackerel. These fish are in turn preyed upon by larger pelagic fish, and together they form a significant contribution to the forage base of marine mammals and birds. Schooling species found in offshore waters include northern anchovy, Pacific sardine, yellowfin tuna (*Thunnus albacares*), bluefin tuna (*T. thynnus*), albacore (*T. alalunga*), Pacific bonito and salmon (*Oncorhynchus spp*.). Northern anchovy and Pacific sardine are among the most abundant species and are the major prey of the mackerel and bonito; northern anchovy, Pacific sardine, mackerel, and bonito form the food base for the tuna.

The largest habitat in the SCB is the pelagic (open water) zone. Forty percent of the fish species in the SCB occupy this habitat, which has three vertical subzones (epipelagic, mesopelagic, and bathypelagic). The epipelagic zone is dominated by small, schooling fish such as northern anchovy, Pacific sardine and Pacific mackerel, which feed on plankton; by predatory schooling fish such as Pacific bonito and yellowtail; and by large, solitary predators like blue shark (*Prionace glauca*) and swordfish (*Xiphias gladius*) (Bedford and Hagerman 1983; Cailliet and Bedford 1983; Mais 1974, 1977; Squire 1983). Northern anchovy and Pacific Sardine are the most abundant epipelagic fish and may be the usually dominant species (MacCall *et al.* 1976; Squire 1983). However, abundance of epipelagic fishes varies with the seasons. Anchovy schools are more abundant and larger in the inshore areas of the northern SCB during the summer and fall (Cross and Allen 1993). From late winter to spring, anchovy schools move offshore to spawn (Mais 1974, 1977). Yellowtail migrate into the SCB from Baja California in the spring when surface water temperatures begin to warm. They spawn offshore in the summer and return south in the fall (Cross and Allen 1993).

The pelagic zone plays a critical role in sustaining fish populations because the eggs of nearly all fish are either deposited or hatched there. Even the larvae of fish that bear live young or attach eggs to the substrate (Cross and Allen 1993) spend the initial portion of their lives in the pelagic zone. Microscopic fish larvae are known as ichthyoplankton. The abundance of ichthyoplankton is greatest in the SCB and off northern Baja California (Cross and Allen 1993). The ichthyoplankton population of the SCB within 62 miles (100 kilometers) from the coast is dominated by northern anchovy larvae (83 percent). Rockfish (*Sebastes* spp.) and California smoothtongue (*Leuroglossus stilbius*) larvae each represent 4 percent of the

ichthyoplankton population. Larvae of other species, such as white croaker, pacific hake, and California halibut form 2 percent or less of ichthyoplankton in the SCB (Gruber *et al.* 1982). Research on ichthyoplankton dynamics in the SCB has focused primarily on Pacific sardine, northern anchovy, and Pacific mackerel (Hunter 1981; Sherman *et al.* 1983).

1.2.5 Seabirds

Over 195 species of birds use open water, shore, or island habitats in the SCB south of Point Conception (Baird 1993). Many of these species are found in the CINMS (Table C-3). 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 seabirds (Lehman 1994). The Channel Islands provide breeding and nesting sites for many species and large numbers of seabirds, including many threatened and endangered species (Table C-4). The diversity of habitats provided both on- and offshore also contributes to the high species diversity in the region (Figure C-3). Sandy beaches provide foraging and resting habitat for a number of seabirds including black-bellied plover, willet, whimbrel, long-billed curlew, gulls, and sanderlings. The upland potions of the beach provide kelp deposits that attract invertebrates where black and ruddy turnstones, dowitchers, and other seabird species forage.

Table C-3. Seabirds Associated with the CINMS

Common Names of Bird Families and Species	Scientific Names	Presence in CINMS*
Loons (offshore)	Family: Gaviidae	
Red throated Loon	*Gavia stellata*	Common visitor in winter; rare, but regular in summer
Pacific Loon	*Gavia pacifica*	Uncommon visitor in winter; abundant in spring; rare to locally uncommon in summer; common in fall
Common Loon	*Gavia immer*	Winter visitor; rare in spring; rare but regular in summer
Yellow-billed Loon	*Gavia adamsii*	Casual winter visitor
Grebes (offshore)	Family: Podicipedidae	
Pied-billed Grebe	*Podilymbus podiceps*	Winter visitor; fairly common summer resident
Horned Grebe	*Podiceps auritus*	Winter visitor; very rare in summer
Red-necked Grebe	*Podiceps grisegena*	Winter visitor; very rare fall transient
Eared Grebe	*Podiceps nigricollis*	Winter visitor; very rare in summer
Western Grebe	*Aechmophorus occidentalis*	Winter visitor; several spring breeding records; uncommon to locally common in summer
Clark's Grebe	*Aechmophorus clarkii*	Winter visitor; several spring breeding records; very uncommon to locally common in summer
Albatrosses (offshore)	Family: Diomedeidae	
Black-footed Albatross	*Phoebastria nigripes*	Uncommon to rare visitor in fall/winter; uncommon in spring/summer

Table C-3, Page 1 of 8

Table C-3. Seabirds Associated with the CINMS (Continued)

Common Names of Bird Families and Species	Scientific Names	Presence in CINMS*
Laysan Albatross	*Diomedea immutabilis*	Rare but regular visitor in winter/summer/fall
Fulmars (offshore)	Family: Procellariidae	
Northern Fulmar	*Fulmarus glacialis*	Winter/spring/fall visitor; very rare in summer
Petrels (offshore)	Family: Procellariidae	
Mottled Petrel	*Pterodroma inexpectata*	Casual winter visitor offshore
Murphy's Petrel	*Pterodroma ultima*	Very rare visitor well offshore
Cook's Petrel	*Pterodroma cookii*	Casual winter visitor; very rare visitor well offshore in spring/summer
Stejneger's Petrel	*Pterodroma longirostris*	Casual winter visitor
Shearwaters (offshore)	Family: Procellariidae	
Pink-footed Shearwater	*Puffinus creatopus*	Very rare in winter; common visitor in spring/summer
Flesh-footed Shearwater	*Puffinus carneipes*	Casual visitor offshore
Buller's Shearwater	*Puffinus bulleri*	Very rare fall visitor well offshore
Sooty Shearwater	*Puffinus griseus*	Common to abundant visitor in spring/summer/fall; very rare but regular in winter
Short-tailed Shearwater	*Puffinus tenuirostris*	Very rare winter visitor
Black-vented Shearwater	*Puffinus opisthomelas*	Rare winter visitor; casual in spring/summer; common to uncommon in fall
Storm-Petrels (offshore)	Family: Hydrobatidae	
Wilson's Storm-Petrel	*Oceanites oceanicus*	Casual visitor
Fork-tailed Storm-Petrel	*Oceanodroma furcata*	Casual visitor in winter/spring
Leach's Storm-Petrel	*Oceanodroma leucorhoa*	Uncommon to common in winter/spring/fall; uncommon in summer, breeds on islands
Ashy Storm-Petrel	*Oceanodroma homochroa*	Casual visitor in winter; common resident in spring/summer/fall. Breeds on San Miguel and Santa Cruz Islands
Wedge-rumped Storm-Petrel	*Oceanodroma tethys*	Casual winter visitor

Table C-3. Seabirds Associated with the CINMS (Continued)

Common Names of Bird Families and Species	Scientific Names	Presence in CINMS*
Black Storm-Petrel	*Oceanodroma melania*	Fairly common to common summer visitor, breeds on islands
Least Storm-Petrel	*Oceanodroma microsoma*	Irregularly uncommon to fairly common summer/fall visitor
Tropicbirds (offshore)	Family: Phaethontidae	
Red-billed Tropicbird	*Phaethon aethereus*	Very rare summer/fall visitor
Red-tailed Tropicbird	*Phaethon rubricauda*	Casual visitor
Pelicans (onshore and offshore)	Family: Pelecanidae	
American White Pelican	*Pelecanus erythrorhynchos*	Rare to very rare winter visitor
California Brown Pelican	*Pelecanus occidentalis californicus*	Common year-round. Breeds on Anacapa, Santa Cruz, Santa Barbara islands
Cormorants (onshore and offshore)	Family: Phalacrocoracidae	
Double-crested Cormorant	*Phalacrocorax auritus*	Winter visitor, uncommon and local in summer, breeds on islands
Brandt's Cormorant	*Phalacrocorax penicillatus*	Common to very common winter visitor. Breeds on Channel Islands
Pelagic Cormorant	*Phalacrocorax pelagicus*	Fairly common to common winter visitor; fairly common summer resident, breeds on islands.
Frigatebirds (offshore)	Family: Fregatidae	
Magnificent Frigatebird	*Fregata magnificens*	Rare summer visitor
Geese (onshore and offshore)	Family: Anatidae	
Brant	*Branta bernicla*	Rare winter and fall visitor; common to abundant transient just offshore in spring; very rare in summer
Scoters (offshore)	Family: Anatidae	
Surf Scoter	*Melanitta perspicillata*	Common winter visitor; rare to uncommon in summer
White-winged Scoter	*Melanitta fusca*	Transient winter visitor

Table C-3, Page 3 of 8

Table C-3. Seabirds Associated with the CINMS (Continued)

Common Names of Bird Families and Species	Scientific Names	Presence in CINMS*
Plovers (onshore)	Family: Charadriidae	
Black-bellied Plover	*Pluvialis squatarola*	Common winter visitor; uncommon to fairly common but local in summer
American Golden Plover	*Pluvialis dominica*	Casual spring transient; rare in fall
Pacific Golden Plover	*Pluvialis fulva*	Very rare in winter; very rare transient in spring; rare in fall
Western Snowy Plover	*Charadrius alexandrinus*	Fairly common, but local winter visitor; spring resident; uncommon to fairly common but local in summer, breeds on islands.
Semipalmated Plover	*Charadrius semipalmatus*	Uncommon and local winter visitor; fairly common transient in spring/fall; a few individuals in summer
Killdeer	*Charadrius vociferus*	Common permanent resident year round, breeds on islands
Oystercatchers (onshore)	Family: Haematopodidae	
Black Oystercatcher	*Haematopus bachmani*	Uncommon permanent resident year round, breeds on islands
Stilts (onshore)	Family: Recurvirostridae	
Black-necked Stilt	*Himantopus mexicanus*	Uncommon to rare in winter; uncommon resident in summer
Avocets (onshore)	Family: Recurvirostridae	
American Avocet	*Recurvirostra americana*	Fairly common transient
Yellowlegs (onshore)	Family: Scolopacidae	
Greater Yellowlegs	*Tringa melanoleuca*	Fairly common to locally common winter visitor; rare in summer
Lesser Yellowlegs	*Tringa flavipes*	Very rare to rare in winter; uncommon to fairly common fall transient
Sandpipers (onshore)	Family: Scolopacidae	
Solitary Sandpiper	*Tringa solitaria*	Very rare to casual in spring; rare but regular fall transient
Willet	*Catoptrophorus semipalmatus*	Winter visitor; fairly common in spring/summer
Wandering Tattler	*Heteroscelus incanus*	Winter visitor; casual in spring/summer

Table C-3. Seabirds Associated with the CINMS (Continued)

Common Names of Bird Families and Species	Scientific Names	Presence in CINMS*
Spotted Sandpiper	*Actitis macularia*	Winter visitor; rare summer resident
Little Curlew	*Numenius minutus*	Casual vagrant
Whimbrel	*Numenius phaeopus*	Fairly common to locally common winter visitor
Long-billed Curlew	*Numenius americanus*	Winter visitor; uncommon in spring/summer
Marbled Godwit	*Limosa fedoa*	Winter visitor; uncommon to rare in spring/summer
Ruddy Turnstone	*Arenaria interpres*	Winter visitor; very rare in summer
Black Turnstone	*Arenaria melanocephala*	Winter visitor; very rare in summer
Surfbird	*Aphriza virgata*	Casual in winter; fairly common transient in spring; very rare in fall
Red Knot	*Calidris canutus*	Casual winter and summer transient
Sanderling	*Calidris alba*	Winter visitor; uncommon and local in summer
Semipalmated Sandpiper	*Calidris pusilla*	Casual spring transient
Western Sandpiper	*Calidris mauri*	Common to uncommon but local in winter; very rare in summer
Least Sandpiper	*Calidris minutilla*	Winter visitor; casual in summer
Baird's Sandpiper	*Calidris bairdii*	Casual in spring; very uncommon fall transient
Pectoral Sandpiper	*Calidris melanotos*	Casual in spring; locally uncommon fall transient
Sharp-tailed Sandpiper	*Calidris acuminata*	Very rare fall transient
Dunlin	*Calidris alpina*	Winter visitor; uncommon spring transient; fairly common to locally common fall transient
Stilt Sandpiper	*Calidris himantipus*	Casual in spring; very rare fall transient
Buff-breasted Sandpiper	*Tryngites subruficollis*	Casual fall vagrant
Ruff	*Philomachus pugnax*	Winter visitor; very rare fall transient
Short-billed Dowitcher	*Limnodromus griseus*	Very rare winter/spring transient
Long-billed Dowitcher	*Limnodromus scolopaceus*	Winter visitor; casual in summer
Common Snipe	*Gallinago gallinago*	Winter visitor
Phalaropes (onshore)	Family: Scolopacidae	
Wilson's Phalarope	*Phalaropus tricolor*	Uncommon to fairly common spring transient; fairly common to common fall transient

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Table C-3. Seabirds Associated with the CINMS (Continued)

Common Names of Bird Families and Species	Scientific Names	Presence in CINMS*
Red-necked Phalarope	*Phalaropus lobatus*	Common to locally abundant spring transient; rare in summer; common fall transient
Red Phalarope	*Phalaropus fulicaria*	Absent to fairly common winter visitor; rare to abundant in spring; very rare in summer; uncommon to common in fall
Jaegers (offshore)	Family: Laridae	
Pomarine Jaeger	*Stercorarius pomarinus*	Uncommon in winter, casual in summer
Parasitic Jaeger	*Stercorarius parasiticus*	Rare but regular winter visitor, casual in summer
Long-tailed Jaeger	*Stercorarius longicaudus*	Uncommon to rare fall transient
Skuas (offshore)	Family: Laridae	
South Polar Skua	*Catharacta maccormicki*	Rare spring/fall visitor well offshore; casual in summer
Gulls (onshore and offshore)	Family: Laridae	
Laughing Gull	*Larus atricilla*	Casual vagrant
Franklin's Gull	*Larus pipixcan*	Casual in winter/summer; very rare transient in spring/fall
Little Gull	*Larus minutus*	Casual vagrant
Common Black-headed Gull	*Larus ridibundus*	Casual vagrant in fall/winter
Bonaparte's Gull	*Larus philadelphia*	Winter visitor; rare in summer
Heermann's Gull	*Larus heermanni*	Common winter visitor; uncommon spring visitor
Mew Gull	*Larus canus*	Locally common winter visitor; casual in summer
Ring-billed Gull	*Larus delawarensis*	Common winter visitor; fairly common in summer
California Gull	*Larus californicus*	Common winter visitor; fairly common to locally common in summer
Herring Gull	*Larus argentatus*	Very uncommon to locally fairly common in winter; casual in summer
Thayer's Gull	*Larus thayeri*	Rare to locally winter visitor
Western Gull	*Larus occidentalis*	Common resident year round. Breeds along North Coast and Channel Islands
Glaucous-winged Gull	*Larus glaucescens*	Uncommon to fairly common winter visitor; rare but somewhat regular in spring/summer
Glaucous Gull	*Larus hyperboreus*	Very rare winter visitor

Table C-3. Seabirds Associated with the CINMS (Continued)

Common Names of Bird Families and Species	Scientific Names	Presence in CINMS*
Black-legged Kittiwake	*Rissa tridactyla*	Irregular winter visitor; offshore transient in spring
Sabine's Gull	*Xema sabini*	Uncommon spring/fall transient; casual in summer
Terns (onshore and offshore)	Family: Laridae	
Gull-billed Tern	*Sterna nilotica*	Casual visitor
Caspian Tern	*Sterna caspia*	Very rare to rare in winter; fairly common summer visitor
Royal Tern	*Sterna maxima*	Fairly common winter visitor; uncommon in spring; casual in summer; fairly common transient in fall
Elegant Tern	*Sterna elegans*	Casual in winter; rare in spring; common in summer/fall
Common Tern	*Sterna hirundo*	One winter record; rare summer visitor
Arctic Tern	*Sterna paradisaea*	Rare in spring; uncommon fall transient well offshore
Forster's Tern	*Sterna forsteri*	Common winter visitor; common transient and uncommon to fairly common summer visitor
California Least Tern	*Sterna antillarum brownii*	Fairly common but local resident in summer
Black Tern	*Chlidonias niger*	Rare and declining
Skimmers (onshore and offshore)	Family: Laridae	
Black Skimmer	*Rhynchops niger*	Very rare visitor, increasing
Alcids (onshore and offshore)	Family: Alcidae	
Common Murre	*Uria aalge*	Uncommon to common winter transient and offshore visitor; rare in spring/summer
Pigeon Guillemot	*Cepphus columba*	Casual in winter/spring/fall; common summer resident. Breeds on North Coast and Channel Islands
Marbled Murrelet	*Brachyramphus marmoratus*	Very rare visitor in winter/summer/fall; casual in spring
Xantus's Murrelet	*Synthliboramphus hypoleucus*	Very rare in winter/fall; common resident offshore in spring/summer. Breeds on Channel Islands
Craveri's Murrelet	*Synthliboramphus craveri*	Very rare summer/fall visitor offshore
Ancient Murrelet	*Synthlibormaphus antiquus*	Rare and irregular winter visitor; casual in spring/summer

Table C-3. Seabirds Associated with the CINMS (Continued)

Common Names of Bird Families and Species	Scientific Names	Presence in CINMS*
Cassin's Auklet	*Ptychoramphus aleuticus*	Widespread in winter; locally common in summer. Breeds on Channel Islands
Parakeet Auklet	*Cyclorrhynchus psittacula*	Casual vagrant well offshore
Rhinoceros Auklet	*Cerorhinca monocerata*	Fairly common to common transient and visitor. Breeds at Point Arguello
Tufted Puffin	*Fratercula cirrhata*	Very rare visitor well offshore in winter, spring, and fall, breeding records from the islands.
Horned Puffin	*Fratercula corniculata*	Casual spring visitor well offshore

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Notes: Common to Abundant: 15 or more individuals per day in the proper habitat; Uncommon to Fairly Common: 1-15 individuals per day in the proper habitat; Rare or Infrequent: 1-15 individuals per season in the proper habitat; Very Rare or Very Infrequent: average of fewer than 1 record per season; Casual: 2-10 records total for Santa Barbara County; Accidental: 1 record for Santa Barbara County.

Source: The Birds of Santa Barbara County, California by Paul E. Lehman (1994, Vertebrate Museum, University of California, Santa Barbara)

Table C-4. Seabird Species Breeding in the CINMS

Common Name	Scientific Name
Western Grebe	*Aechmophorus occidentalis*
Clark's Grebe	*Aechmophorus clarkii*
Ashy Storm-Petrel	*Oceanodroma homochroa*
Black Storm-Petrel	*O. melania*
Leach's Storm-Petrel	*O. leucorhoa*
California Brown Pelican	*Pelecanus occidentalis californicus*
Double-crested Cormorant	*Phalacrocorax auritus*
Brandt's Cormorant	*P. penicillatus*
Pelagic Cormorant	*P. pelagicus*
Great Blue Heron	*Ardea herodias*
Snowy Plover	*Charadrius alexandrinus*
Killdeer	*Charadrius vociferus*
Black Oystercatcher	*Haematopus bachmani*
Western Gull	*Larus occidentalis*
Pigeon Guillemot	*Cepphus columba*
Xantus's Murrelet	*Synthliboramphus hypoleuca*
Cassin's Auklet	*Ptychoramphus aleuticus*
Rhinoceros Auklet	*Cerorhinca monocerata*
Tufted Puffin	*Fratercula cirrhata*

Source: CDFG 2002.

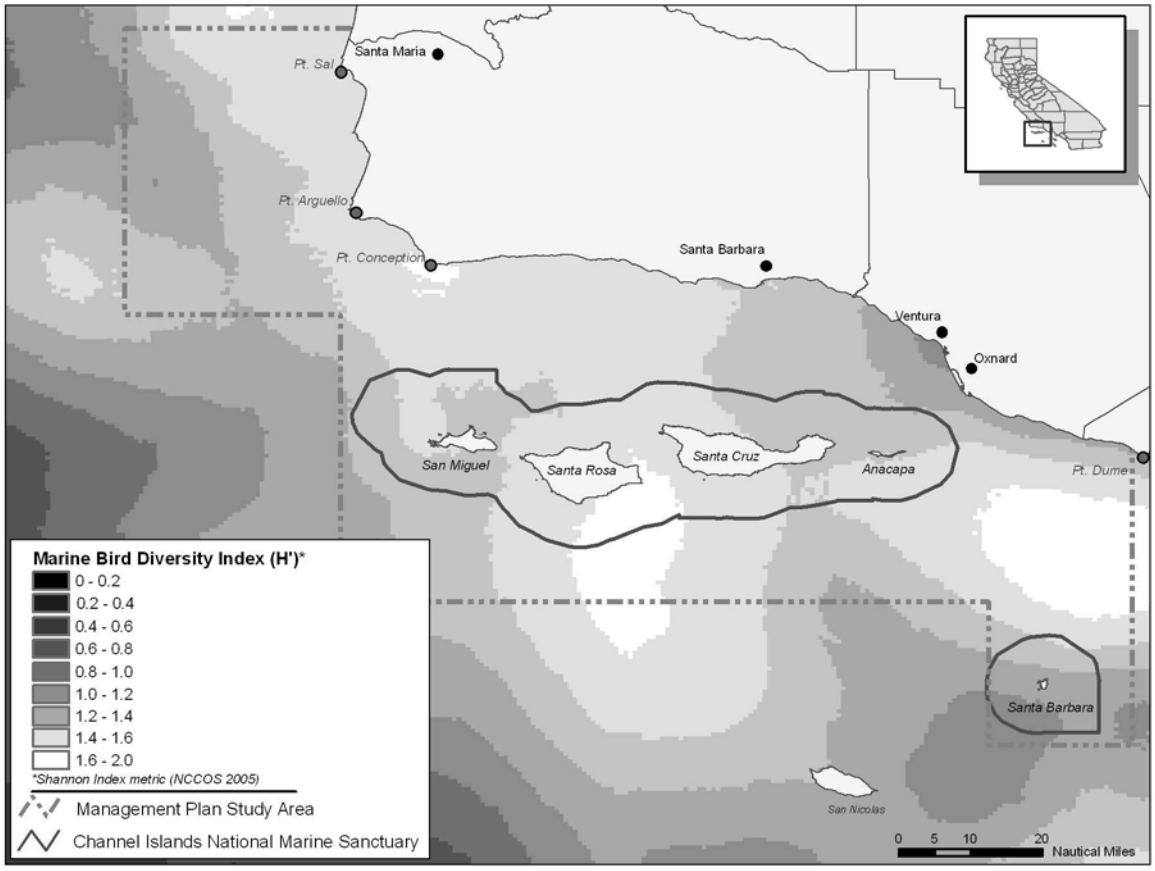

Figure C-3. Distribution of Breeding Seabird Diversity in the CINMS

Seabird occurrence in the open ocean (more than 1 kilometer offshore) is correlated to with currents and submarine topography. Water temperature affects seabird abundance as it affects upwelling. Near the Channel Islands region, upwelling occurs regularly in the waters off Point Conception, Arguello Canyon, and along the Santa Rosa-Cortez Ridge (Lehman 1994). In addition, certain seabirds frequent waters that have a specific range of temperatures. This is correlated to rare or one-time sightings of sub-tropical seabirds from the south when water temperatures become abnormally warm, and of cold-water seabirds from the north when waters become abnormally cool. Kittiwakes and fulmars have been observed in late winter and early spring when waters reach minimum temperature (Lehman 1994). Seabirds range over the open ocean, nearshore waters, bays, harbors, and rocky beaches.

Birds depend on healthy coastal and marine habitats in the CINMS. Seabirds feed and roost in many of the coastal areas of the northern Channel Islands. Sandy beaches provide foraging and resting habitat for a number of seabirds including black-bellied plover, willet, whimbrel, long-billed curlew, gulls, and sanderlings. Birds depend on the spatial transitional areas that exist between the subtidal, intertidal and upland areas for feeding and reproduction. The upland potions of the beach provide kelp deposits that attract invertebrates where black and ruddy turnstones, dowitchers, and other seabird species forage.

1.2.5.1 Special-Status Bird Species

Several bird species within the CINMS have special status under federal or State law (Table C-5). In addition, most seabirds are protected by the Migratory Bird Treaty Act. For several species listed as threatened or endangered, the northern Channel Islands represent designated critical habitat areas. Birds depend on a healthy coastal marine environment for survival, and feed near shore on small fishes associated with the CINMS. Additional descriptive information on many of these species is presented below.

Table C-5. Birds with Special Status Under Federal or California State Law Commonly Found in the CINMS

Common Name	Scientific Name	Status
Ashy storm-petrel	*Oceanodroma homochroa*	California Species of Concern (CSC), Department of Fish and Game Petitioned for federal ESA listing (2008)
Black storm-petrel	*Oceanodroma melania*	CSC
California brown pelican	*Pelecanus occidentalis californicus*	Federally Endangered,* State Endangered, State Fully Protected Species
California least tern	*Sterna antillarum browni*	Federally Endangered, State Endangered, State Fully Protected Species
Double-crested cormorant	*Phalacrocorax auritus*	CSC
Rhinoceros auklet	*Cerorhinca monocerata*	CSD
Western snowy plover	*Charadrius alexandrinus nivosus*	Federally Threatened, CSC
Xantus' murrelet	*Synthliboramphus hypoleucus*	CSC Candidate for federal ESA listing (1994)

*On February 20, 2008, the U.S. Fish and Wildlife Service published a proposed rule in the Federal Register (73 FR 9408) to remove the Brown Pelican throughout its range from the list of endangered and threatened species.
Sources: CDFG 2002, 73 FR 28080, 73 FR 9408.

Leach's storm petrel is fairly common along the Pacific coast, uncommon south of breeding range along Atlantic coast, and has a highly restricted breeding range. It inhabits coastal islands and open sea. In the Channel Islands, Leach's storm-petrels bred on Santa Barbara and San Miguel Islands (Lehman 1994). It is nocturnal in its breeding activities and nests in colonies found on coastal islands, such as those within the region. During the day, they nest in horizontal burrows that can be up to 1 meter long or are at sea foraging for food. This species feeds by hovering just above the water and swooping down to catch plankton, small fish, and squid (Ehrlich *et al.* 1988). One egg is laid anytime from early June to late July, and the incubation lasts 40 to 50 days, during which time both parents tend the egg. Winters are spent at sea, possibly in the tropics. (Nova Scotia Museum of Natural History 2000)

Ashy storm-petrel (Oceanodroma homochroa)

Ashy storm-petrels are small, highly pelagic, seabirds that prey on small invertebrates (young squid, euphausiids, crab larvae) and small fish while they flutter along at the ocean's surface. Ashy storm-petrels are restricted to the north-east Pacific Ocean, breeding on islands from central to southern

California (with a few small colonies in Baja California and northern California). Approximately one-half of the world population, estimated at less than 10,000 individuals, nest at the Farallon Islands and half in the Channel Islands, primarily at San Miguel, Santa Barbara, and Santa Cruz islands (Carter *et al.* 1992). The breeding period is from April through November, although birds may visit their nesting colonies year-round. Dispersal in the non-breeding season is thought to be limited. Large numbers congregate each fall in Monterey Bay. Populations of ashy storm-petrels have declined by an estimated 34 percent over the past 20 years at the Farallon Islands (Sydeman *et al.* 1998a,b) (long-term trends are not available for the Channel Islands population). Factors in the decline include habitat loss from invasive non-native plants; introduction of feral cats, house mice, and other nonnative animals; decline in zooplankton in the SCB; and predation by house mice, western gulls, burrowing owls, and other owl species (Sydeman *et al.* 1998; Nur *et al.* 1999). Ashy storm-petrels are also known to be sensitive to human disturbance, oil pollution, and marine pollution.

In May 2008 the U.S. Fish and Wildlife Service announced a determination that a petition received had presented sufficient information to indicate that listing of the Ashy storm-petrel under the Federal Endangered Species Act (ESA) may be warranted. A status review was initiated to determine if listing the species is warranted (73 FR 28080).

Black storm-petrel (Oceanodroma melania)

Black storm-petrels are found in the north-east Pacific Ocean. They primarily breed on islands of the coast of Baja California and in the Gulf of California (Harrison 1983). A small population, estimated at 274 individuals, breeds from April to October on Santa Barbara Island in Santa Barbara County (Carter *et al.* 1992). After breeding, birds generally move south towards northern South America, however, in warm-water years large numbers move as far north as Monterey and Point Reyes (Harrison 1983).

California brown pelican (Pelecanus occidentalis californicus)

The California brown pelican was listed as an endangered species under the ESA in 1970 and by the Commission in 1971 because of decreased population numbers and extensive reproductive failures. These resulted from the effects of DDT and other chlorinated hydrocarbons in the late 1960s. In addition, they are a fully protected species under Fish and Game Code section 3511. California brown pelicans are found in estuarine, marine subtidal, and pelagic waters along the California coast. The California Brown Pelican Recovery Plan describes the nesting range as occurring in four distinct geographic areas: 1) the SCB, 2) the Gulf of California, 3) southwest Baja California, and 4) mainland Mexico (*et al*, Sinaloa and Nayarit) (U.S. Fish and Wildlife Service 1983). California brown pelicans breed in the SCB at West Anacapa Island, Ventura County, and Santa Barbara Island, Santa Barbara County, in the Channel Islands and several islands off Baja California, Mexico (including the Coronados Islands and Todos Santos Island). The total metapopulation of the California brown pelican is estimated at 70,680 ± 2,640 breeding pairs (Anderson *et al*. 2007). Approximately 68% of the total breeding population is located on the Gulf of California (NMFS 2007). During the non-breeding season birds disperse along the coast, as far north as Vancouver, British Columbia and south to El Salvador.

California brown pelicans are colonial nesters and require nesting grounds free from human disturbance and mammalian predators, and must be in proximity to adequate food supplies (Gress and Anderson 1983). Nest sites are located on steep, rocky slopes and bluff edges and are comprised of sticks or debris. Communal roost sites are essential habitat for California brown pelicans (Gress and Anderson 1983) because, unlike other seabirds, California brown pelicans have wettable plumage (Rijke 1970) which can become heavy and hypothermic in cold water if they do not come ashore regularly to dry and recondition their plumage. Roost site selection is based on minimal disturbances and microclimate features that aid in thermoregulation. California brown pelicans congregate in traditional high quality roosts at night with

major night roosts supporting hundreds to thousands of pelicans (Briggs *et al.* 1987). Substantial numbers (averaging in the thousands) roost on South Farallon Island and feed in the surrounding waters during the fall and winter.

California brown pelicans are diving birds that feed almost exclusively on fish and dive from 6 to12 meters (6.6–13.2 feet) in the air (Johnsgard 1993). The main prey items in California are northern anchovies, Pacific sardines, and Pacific mackerel. After the collapse of the sardine fishery in the 1950s, northern anchovies were found to comprise 92 percent of the diet of California brown pelicans nesting in the SCB (Gress *et al.* 1980; Gress and Anderson 1983). In recent years however, Pacific sardine populations have been increasing and may now be common items in the California brown pelican diet.

On February 20, 2008, the U.S. Fish and Wildlife Service published a proposed rule in the Federal Register (73 FR 9408) to remove the Brown Pelican throughout its range from the list of endangered and threatened species.

Double-crested cormorant (Phalacrocorax auritus)

The double-crested cormorant is a California species of special concern. The double-crested cormorant is 26 to 32 inches in length. Adult plumage is black with iridescent green and purple above. The unfeathered throat pouch is yellow-orange, and the bill and feet are black. Juveniles are pale brown above with varying amounts of white below. The throat pouch and lower mandible are yellow and sometimes the upper mandible is yellow as well. The iris is brown in juveniles and blue-green in breeding adults. This species has a long tail and flies with a distinctive crook in its neck (Audubon 1988).

This migratory breeding seabird is a highly adaptive colonial breeder that utilizes a variety of habitats and is found both on the coast and inland. Breeding locations may change from year to year. This species breeds in the Aleutian Islands, Alaska and southwards along the Pacific coast, to Baja California, Mexico. This species breeds on Santa Barbara, Anacapa and San Miguel Islands (Lehman 1994). Double-crested cormorants feed on schooling fish, aquatic invertebrates, and, rarely, small invertebrates. This species uses wetland to open water habitats, and nests along seacoasts, on coastal cliffs and around rivers, marshes, and lakes. The birds build a platform nest of sticks, seaweed and other materials on the ground or in trees (Ehrlich *et al.* 1992).

Rhinoceros auklet (Cerorhina monocerata)

The rhinoceros auklet is a California species of special concern. This species is approximately 15 inches in length with plumage that is sooty brown above and a grayish-brown throat, breast, sides, and flanks. Two stripes of white plumes run backward across the face; one from the base of the bill below the eye, and one just above and behind the eye. The bill is reddish-orange with a pale knob at the base of the lower mandible. In winter, the facial stripes and knob on the bill are absent. Juveniles are darker in color, with a smaller, darker bill similar to the winter plumage adult (Audubon 1988).

The rhinoceros auklet is a pelagic migratory breeding seabird common along most of the West Coast in fall and winter. It breeds colonially in burrows in maritime and inland grassy slopes, occasionally on flat ground on forest floors, usually with other alcids, in areas from the western Sea of Okhotsk, Sakhalin, and the southern Kuril Islands south of Japan and northeast Korea. They also breed from the Aleutians east to southern Alaska, south through British Columbia and Washington to California. This species is often seen in large numbers close inshore and feeds on mostly small fish and some squid. Rhinoceros auklets breed on several of the Channel Islands (Lehman 1994).

California Least Tern (Sterna antillarum browni)

The California least tern is Federally and California State-listed as endangered. The California least tern is approximately 8 and a half to 9 and a half inches in length. In breeding plumage, adults have a broad white forehead framed by a black crown and a black line running from the crown through the eye to the base of the bill. The mantle and short, strongly forked tail are pearl gray. A long, thin wedge of black up the leading edge of the outer wing, formed by the two outermost primary feathers and coverlets, is conspicuous in flight. Both the narrow black-tipped bill and the feet are yellow. Winter adults retain the black head pattern, which is blurred by a mixture of black and white feathers. Juveniles have a largely white head with a black line through the eye and a black nape. The entire leading edge of the wing is dark. The bill is black and the legs are brown (Audubon 1988).

California least terns feed on fish, such as top smelt, and aquatic invertebrates. The California least tern is 1 of 12 recognized subspecies of the least tern, 3 of which inhabit the United States. The breeding range of this subspecies extends along the Pacific coast from San Francisco Bay, California, to Bahia de San Quintin, Baja California, Mexico. The California least tern is a migratory species that arrives in California by late April to breed and departs to unknown southerly locations by August. It nests in colonies on coastal, sandy, open areas, usually around bays, estuaries, and creek and river mouths. Nests are unlined open scrapes or depressions in the sand on open, flat beaches that the birds often adorn with small fragments of shell or pebbles. During the average 2l-day incubation period, the nest is tended continually by both parents. The adults tend flightless, but quite mobile, chicks for approximately three weeks after hatching. After fledging, the young California least terns do not become fully proficient at capturing fish until after they migrate from the breeding grounds. Adults and fledglings usually leave the breeding colony within about ten days of fledging (Ehrlich *et al.* 1989).

Western Snowy Plover (Charadrius alexandrinus)

The Pacific coast population of the western snowy plover was Federally listed as threatened on March 5, 1993. A recovery plan was prepared in 2007 (72 FR 54279). The final rule listing the western snowy plover as threatened describes its biology and reasons for its decline (58 *Federal Register* 42: 12864). Critical habitat was designated for the western snowy plover and includes all suitable habitat from Point Sal to Point Conception including Vandenberg AFB, the Santa Ynez River mouth, and Jalama Beach; Santa Barbara coast beaches including Devereux Beach (Coal Oil Point), Santa Barbara Harbor Beach, and Carpinteria Beach; Oxnard lowlands beaches including San Buenaventura Beach, Mandalay Bay/Santa Clara River mouth, Ormond Beach, and Mugu Lagoon; and the Channel Islands including San Nicolas Island beaches (65 Federal Register 64:68508). In addition, the coastal population of the western snowy plover is a California Species of Special Concern, and on the Audubon Society's Watch List.

The western snowy plover has gray-brown upper parts, a conspicuous patch on either side of the breast, a white eyebrow extending back from the forehead, a long thin black bill, and slate-colored legs. Adults have dark ear coverlets and breast patches, are blackish in breeding plumage, and gray-brown in winter. Breeding birds have a black bar across the forecrown as well. Juveniles have paler ear coverlets and breast patches are the same colors as the upper parts (Audubon 1988).

Western snowy plovers are migratory breeding shorebirds that forage on invertebrates in intertidal zones, the wrack line, dry sandy areas above the high tide line, salt pans, and the edges of salt marshes. They feed by quickly running, stopping to pick up food or probe the surf line. Western snowy plovers eat marine worms, small crustaceans, and at inland locations, eat insects. The Pacific coast population nests near tidal waters along the mainland coast and offshore islands from southern Washington to southern Baja California, Mexico. Most nesting occurs on unvegetated to moderately vegetated, dune-backed beaches and sand spits. Other less common nesting habitats include salt pans, dredged soils, and salt

pond levees. Nest site fidelity is common. Nesting and chick rearing activity generally occur between March 1 and September 30. During the non-breeding season, western snowy plovers may remain at breeding sites or may migrate to other locations, with most wintering south of Bodega Bay, California. Many birds from the interior population winter on the central and southern coast of California.

Xantus's murrelet (Synthliboramphus hypoleucus)

Xantus's murrelets are considered a California species of special concern and are a globally rare seabird species (one of the ten rarest seabird species in the North Pacific). It was designated as a threatened species by the state of California in 2004, and is a candidate species for designation as threatened or endangered under the U.S. ESA due to its small population size, limited breeding range, , and known threats to colonies. A recent estimate of the world population size is 39,700 birds (Karnovsky *et al.* 2005). Xantus's murrelets are small birds that feed on small, schooling fish including northern anchovies, sardines, rockfish, Pacific sauries, and euphausids (crustaceans) (Hunt *et al.* 1979; Hamilton *et al.* 2004). During the breeding season, the distance that they travel from the nesting colony to obtain prey is highly variable and probably dependent upon the availability and location of prey patches (Whitworth *et al.* 2000). Long incubation shifts, the ability to leave eggs unattended, and the fact that chicks go to sea at two days of age may allow for long-distance foraging away from nesting colonies to obtain prey (Carter *et al.* 2000). The world population of Xantus's murrelet only breeds from the Channel Islands south to Central Baja California, Mexico. The United States breeding population nests exclusively in the Channel Islands, primarily at Santa Barbara Island (along with San Miguel, Santa Cruz, and Anacapa islands). They return to the nesting islands in February and disperse from the islands by mid-July. They nest in rock crevices along steep cliff edges, under bushes, on the ground in vegetation, in burrows, under debris piles, and under human made structures. Daylight hours are spent on nests or foraging at sea, whereas nest site selection, incubation shift changes, and fledging all occur under cover of night (Hunt *et al.* 1979). Chicks depart to the sea with their parents at night at 2 days of age and are dependent on their parents for an extended period of time (Gaston and Jones 1998). Chicks that get lost or separated from their parents at night, or those who leave the nest during the day, are often fed upon by predators (*e.g.*, western gulls).

1.2.6 Sea Turtles

Four species of sea turtles have been reported in the offshore southern California region. Three of these are members of the family Cheloniidae while one is the only living member of the family Dermochelyidae. The cheloniids include the green sea turtle (*Chelonia mydas*), the loggerhead sea turtle (*Caretta caretta*), and the olive ridley sea turtle (*Lepidochelys olivacea*). The only dermochelyid is the leatherback sea turtle (*Dermochelys coriacea*) (National Marine Fisheries Service [NMFS] and United States Fish and Wildlife Service [USFWS] 1998a, b, c, d).

The leatherback sea turtle is the species most commonly seen off the coast of California and has been reported in the Pacific Ocean as far south as Chile and as far north as Alaska and the Bering Sea. In addition to offshore southern California, where they are only occasionally sighted, loggerhead sea turtles are also commonly found in the North Pacific Ocean, and travel between nesting beaches in Japan and north of Hawaii. A resident foraging subpopulation of green turtles is found in San Diego Bay and most recently in the Long Beach, California area, but this species is rarely found north of these coastal areas. The normal range of olive ridleys does not extend north of Baja California, but individuals have been sighted or caught farther north (NMFS and USFWS 1998a-d).

While none of the four sea turtle species are known to nest on the west coast of the United States, sporadic sightings have been reported within U. S. waters, and sea turtles strand on west coast beaches. Research on the migratory routes of sea turtles throughout the Pacific Ocean and particularly off the U.S.

west coast has improved the knowledge base regarding the oceanographic and environmental features associated with sea turtle movements, as well as the temporal and seasonal variability (NMFS 2004). However, much remains unknown about migration routes and normal movements of sea turtles while at sea (NMFS and USFWS 1998a-d; NMFS and USFWS, 2007a-d).

All sea turtles are protected under the ESA. Leatherback sea turtles are listed as endangered. The other three species are listed as threatened; however the nesting populations of green and olive ridley sea turtles on the Pacific coast of Mexico are listed as endangered.

All four species have been heavily impacted by human and other factors. Terrestrial threats to all four species include: directed take of turtles and/or eggs; poaching; increased human presence; coastal construction; artificial lighting; beach mining; vehicles driving on beaches; beach cleaning; beach replenishment covering eggs too deeply; predation; and beach erosion. Marine threats include: directed take of juvenile or adult turtles; poaching; environmental contaminants; debris entanglement or ingestion; incidental take by fisheries; algae, sea grass and reef degradation; collisions with boats; marina and dock development; dynamite "fishing;" oil exploration and development; entrainment in power plants; underwater blasting; predation; and disease and parasites.

Table C-6. Testudines: Sea Turtles in the CINMS

Species	Population Information	Protected Status	Relative Abundance	Seasonality	Normal Habitat
Green sea turtle *(Chelonia mydas)*	Limited[1]	Threatened and Endangered under ESA	Rare	Warm water months	Coastal to pelagic
Olive ridley sea turtle *(Lepodochelys olivacea)*	Limited[2]	Threatened and Endangered under ESA	Rare	Warm water months	Coastal to pelagic
Loggerhead sea turtle (*Caretta caretta*)	Limited[3]	Threatened under ESA	Rare	Warm water months	
Leatherback sea turtle (*Dermochelys coriacea*)	Limited[4]	Endangered under ESA	Uncommon	Warm water months	Pelagic

1. See: National Marine Fisheries Service and U.S. Fish and Wildlife Service. 2007. Green sea turtle (*Chelonia mydas*) 5–year review: summary and evaluation. http://www.nmfs.noaa.gov/pr/pdfs/species/greenturtle_5yearreview.pdf
2. See: National Marine Fisheries Service and U.S. Fish and Wildlife Service. 2007. Olive ridley turtle (*Lepidochelys olivacea*) 5–year review: summary and evaluation. http://www.nmfs.noaa.gov/pr/pdfs/species/oliveridley_5yearreview.pdf
3. See: National Marine Fisheries Service (NMFS) and U.S. Fish and Wildlife Service (USFWS). 2007. Loggerhead sea turtle (*Caretta caretta*) 5–year review: summary and evaluation. http://www.nmfs.noaa.gov/pr/pdfs/species/loggerhead_5yearreview.pdf
4. See: National Marine Fisheries Service (NMFS) and U.S. Fish and Wildlife Service (USFWS). 2007. Leatherback sea turtle (*Dermochelys coriacea*) 5–year review: summary and evaluation. http://www.nmfs.noaa.gov/pr/pdfs/species/loggerhead_5yearreview.pdf

Sources: NMFS and USFWS 1998a, b, c, d; NMFS and USFWS 2007a, b, c, d

Recovery plans for four of the U.S. Pacific populations of sea turtles cover the west coast of the continental United States, the state of Hawaii, and all of the Pacific islands under U.S. jurisdiction, which extend as far west as Guam. There are two recovery plans for the green turtle, one for the eastern Pacific green turtle, and one for the central and western Pacific green turtle. Recovery plans include determining population status in U.S. waters and supporting censuses in other countries within the range of the four species of sea turtles.

The abundance and distribution of the four sea turtle species within the U.S. west coast waters is not completely known. There have been sightings of turtles within U.S. waters. In addition, information is available regarding incidental take of turtles in U.S. fisheries off the west coast and on the high seas. Additional data are available from NMFS observers stationed aboard tuna purse seine boats in the eastern tropical Pacific. Stranding information is also available for the west coast and Alaska. More data are available from nesting beaches and limited catch records in other countries. A list of sea turtles that may be present in CINMS is presented above in Table C-6.

Green sea turtle (Chelonia mydas)

The eastern Pacific green sea turtle is listed as threatened and endangered throughout its entire range under the ESA. The population has suffered a severe decline over the past 30 years. Between 1950 and 1970, the decline began when wintering green sea turtles in the Gulf of California were vastly over-harvested. The decline continued from 1960 through 1980 with egg harvests on the mainland coast of Mexico (NMFS and USFWS 1998a).

The normal range of the eastern Pacific green sea turtle is from Baja California to Peru and out to the Galapagos Islands. Green sea turtles have been reported as far north as British Columbia, and in 1993, a green sea turtle stranded at Homer Alaska. In 1996, another was recovered from Prince William Sound, Alaska (NMFS and USFWS 1998a).

Green turtles appear to prefer waters with temperatures above 18 - 20 Celsius. Green turtles in these areas are likely foraging in shallow waters or at shallow depths, or transiting to foraging grounds. During warm spells (*e.g.*, El Niño), green turtles may be found considerably north of their normal distribution (NMFS 2004).

One resident population of green sea turtles exists in San Diego Bay (Dutton and McDonald 1990a, b and 1992; McDonald *et al.* 1994; Stinson 1982). About 30 juvenile and adult animals have congregated near the warm water discharge from the San Diego Gas and Electric Company Power Plant. This population is an anomaly.

Green sea turtles are mostly herbivores, but they also eat sardines and anchovies, jellyfish, mollusks, and even worms, among other things (NMFS and USFWS 1998a).

In 2007, a five-year status review for the listed green sea turtle was completed by NMFS and the USFWS (2007a) containing updated information on population, listing classification, and recommended management actions.

Olive ridley sea turtle (Lepodochelys olivacea)

The olive ridley has been regarded as the most abundant sea turtle in the world. Before it was exploited, Clifton *et al.* (1982) estimated that the population off the Pacific coast of Mexico numbered over 10,000,000 animals. Yet in just 1968, over 1,000,000 olive ridleys were caught in Mexico (Carr 1972). The population in Mexico is now listed as endangered because of gross over-harvesting. The rest of the eastern Pacific population is considered threatened. The usual range of the eastern Pacific olive ridley is from Baja California to Peru, usually within 1200 nautical miles of shore (NMFS and USFWS 1998a).

Satellite monitoring of post nesting movements showed migration routes traversing thousands of kilometers over deep (>1000 m) oceanic water, distributed over a very broad range, suggesting that olive ridleys are nomadic and exploit multiple feeding areas, rather than migrate to one specific foraging area (NMFS and USFWS, 1998d).

In 1983, an olive ridley was captured in Los Angles Harbor and brought to Sea World of San Diego. In 1996, an olive ridley stranded at Goleta Beach State Park, near Santa Barbara and within the study area. It was cared for some months by the Santa Barbara Marine Mammal Center, then shipped to a turtle research facility in Hawaii (NMFS 2003).

Olive ridleys reportedly prey on benthic fish, mollusks, crustaceans, tunicates and algae. Pelagic prey includes jellyfish, salps and pelagic red crabs *(Pleuroncodes planipes)*, which in some parts of their range may be a dietary mainstay (NMFS and USFWS 1998b).

In 2007, a five-year status review for the listed olive ridley sea turtle was completed by NMFS and the USFWS (2007d) containing updated information on population, listing classification, and recommended management actions.

Loggerhead sea turtle (Caretta caretta)

The loggerhead sea turtle is listed as threatened throughout its range. In the eastern Pacific, it is rare, although it has been reported as far north as Alaska and as far south as Chile. Most sightings in the eastern Pacific have been made near Baja California, and the greatest concentrations have been off Bahia Magdalena. Strandings and sightings along the west coast have mainly been in Southern California, although a few sightings were reported off Washington (NMFS and USFWS 1998c).

Based on oceanographic conditions, the loggerheads are associated with fronts, eddies, and geostrophic currents. Loggerheads also appear to utilize surface convergent forage habitat to capture their primary prey organisms which float along currents and congregate at fronts (NMFS 2004).

Loggerheads appear to prey on benthic invertebrates, but fish and plants are also eaten. Juveniles off Baja California apparently feast on pelagic red crabs (NMFS and USFWS 1998c).

In 2007, a five-year status review for the listed loggerhead sea turtle was completed by NMFS and the USFWS (2007c) containing updated information on population, listing classification, and recommended management actions.

Leatherback sea turtle (Dermochelys coriacea)

The leatherback sea turtle is considered endangered throughout its range. In the eastern Pacific, the range extends mainly along the slope from Chile to Alaska. The leatherback is the most commonly seen sea turtle off the California coast. For example, from 1986 to 1991, 96 sightings were reported off Monterey Bay alone. Also, leatherback sea turtle strandings account for 50 of 104 sea turtle strandings on the west coast between 1982 and 1991.

Leatherback sea turtles once nested in tremendous numbers on the west coast of Mexico. Nearly half of the world's population of female leatherbacks nested there. Tragically, this population has noticeably declined in recent years. Eggs as well as adult females have been harvested in large numbers.

Leatherback sea turtles are highly migratory, exploiting convergence zones and upwelling areas in the open ocean, along continental margins, and in archipelagic waters (Morreale *et al*. 1994; Eckert 1998; Eckert 1999a). Recent information on leatherback sea turtles tagged off the west coast of the United States has revealed an important migratory corridor from central California, to south of the Hawaiian islands, leading to western Pacific nesting beaches (P. Dutton, NOAA Fisheries, personal communication, December 2003).

Leatherbacks consume mostly cnidarians (medusas and siphonophores) and tunicates (salps and pyrosomas); in lay terms, jellies (NMFS and USFWS 1998d).

In 2007, a five-year status review for the listed leatherback sea turtle was completed by NMFS and the USFWS (2007b) containing updated information on population, listing classification, and recommended management actions.

1.2.7 Marine Mammals

The Channel Islands and surrounding waters support a great diversity of marine mammals. The marine mammals discussed in this section represent three orders: Cetacea--whales dolphins and porpoises; Pinnipedia--seals, sea lions and fur seals; and Carnivora, which in this case is represented only by the southern sea otter (*Enhydra lutris nereis*), a member of the family Mustelidae. Cetaceans live their entire lives at sea, while pinnipeds come ashore periodically to rest, breed, bear young, or molt. In California, sea otters normally spend their entire lives at sea, though some do haul out on land, whereas in Alaska, they often haul out (Vandevere 1972; Miller 1974).

All pinnipeds and cetaceans are protected under the Marine Mammal Protection Act of 1972 (MMPA) and its amendments. In addition, some species are listed under the MMPA as depleted or strategic stocks. Finally, some species are listed as threatened and endangered under the Federal and State ESA.

As in the case of birds, the abundance and distribution of marine mammals is an important indication of the general health and ecological integrity of the marine ecosystems of the CINMS. Marine mammals feed on fishes and invertebrates, which feed on other marine life of the northern Channel Islands. In general, the distribution and abundance of mammals, fishes and other marine life depend on healthy marine habitats, such as kelp forests and associated rocky reef ecosystems. For example, sea lions depend directly on fish and invertebrate prey, which then in turn depend on linkages with lower trophic levels.

Mammals, in turn, are important to healthy marine ecosystems because, for example, they distribute important nutrients and foods throughout the marine environment that other marine life depend on for survival. This section describes the species of marine mammals known to occur in the Channel Islands, including population status, protected status, regional distribution, and seasonality of each species.

1.2.7.1 Cetaceans

At least 33 species of cetaceans have been reported in the region (Leatherwood *et al.* 1982; Leatherwood *et al.* 1987). Most of the reports involve live sightings although a few are known only from strandings. The toothed whales, or odontocetes, number 25 species. Only eight species of baleen whales, or mysticetes, have been reported. Two of these are in their own families. The northern right whale (*Eubalaena glacialis*) is the only representative of the family Balaenidae that has been reported in the CINMS. The California gray whale (*Eschrichtius robustus*) is the sole surviving representative of the family Eschrichtiidae. The other six species are all members of the family Balaenopteridae, more often simply called rorquals.

Of the odontocetes, seven species are commonly seen, either seasonally or year-round. Common species include the long-beaked common dolphin (*Delphinus capensis*), the short-beaked common dolphin (*Delphinus delphis*), the onshore and offshore stocks of bottlenose dolphins (*Tursiops truncatus*), Risso's dolphin (*Grampus griseus*), Pacific white-sided dolphin (*Lagenorhynchus obliquidens*), northern right whale dolphin (*Lissodelphis borealis*), and Dall's porpoise (*Phocoenoides dalli*). The latter two species are generally associated with colder water masses farther offshore and north and do not often range south of the California-Mexico border (Leatherwood *et al.* 1982).

Odontocetes: Oceanic dolphins

A list of oceanic dolphins present in CINMS is provided in Table C-7.

Table C-7. Cetaceans: Odontocetes—Oceanic Dolphins in the CINMS

Common Species Name (Scientific Name)	Population or Stock Size	Protected Status	Relative Abundance	Seasonality	Normal Habitat
Long-beaked common dolphin (*Delphinus capensis*)	Stock size: 32,238	Protected under MMPA	Common	Year-round	Coastal - up to 50 nautical miles offshore
Short-beaked common dolphin (*Delphinus delphis*)	Stock size: 373,573	Protected under MMPA	Common	Year-round	Up to 300 nautical miles offshore
Bottlenose dolphin (*Tursiops truncatus*) Offshore stock	Stock size: 2,956	Protected under MMPA	Common	Year-round	Shelf, slope and offshore
Bottlenose dolphin (*Tursiops truncatus*) Coastal stock	Stock size: 206	Protected under MMPA	Common	Year-round	Surf zone up to 1km offshore
Pacific white-sided dolphin (*Lageno-rhynchus obliquidens*)	Stock size: 25,825	Protected under MMPA	Sporadically abundant	Usually summer and fall	Shelf to farther offshore
Rough-toothed dolphin (*Steno bredanensis*)	Not available for area	Protected under MMPA	Known only from a few strandings	Warm water months	Pelagic
Striped dolphin (*Stenella coeruleoalba*)	Stock size: 20,235	Protected under MMPA		Warm water months	Pelagic
Long-snouted spinner dolphin (*Stenella longirostris*)	Not available for area	Protected under MMPA	Possible during El Niño events	Warm water months	Pelagic
Spotted dolphin (*Stenella attenuata*)	Not available for area	Protected under MMPA	Known only from strandings	Warm water months	Pelagic
Northern right whale dolphin (*Lissodelphis borealis*)	Stock size: 13, 705	Protected under MMPA	Sporadically abundant	Winter and spring	Continental shelf and slope

Table C-7, Page 1 of 2

Table C-7. Cetaceans: Odontocetes - Oceanic Dolphins in the CINMS (Continued)

Common Species Name (Scientific Name)	Population or Stock Size	Protected Status	Relative Abundance	Seasonality	Normal Habitat
Risso's dolphin (*Grampus griseus*)	Stock size: 16,483	Protected under MMPA	Common	Year-round	Shelf, slope and
Short-finned pilot whale (*Globicephala macro-rhynchus*)	Stock size: 970	Protected under MMPA	Uncommon	Most often summer and fall	Shelf, slope and offshore
Killer whale (*Orcinus orca*) E.N. Pacific offshore stock	Stock size: 285	Protected under MMPA	Uncommon	Year-round	Shelf, slope and offshore
Killer whale (*Orcinus orca*) E.N. Pacific transient stock	Stock size: 346	Protected under MMPA	Uncommon	Year-round	
False killer whale (*Pseudorca cressidens*)	Not available for region	Protected under MMPA	Rare	Warm water months	Shelf to offshore and pelagic

Table C-7, Page 2 of 2
Note: MMPA – Marine Mammal Protection Act of 1972 and its amendments
Source: Carretta *et al.* 2001 and 2002

Long-beaked Common Dolphin (Delphinus capensis)

Two species of common dolphins, the long-beaked and the short-beaked, are found in the eastern north Pacific (Heyning and Perrin 1994). Prior to this time, only one species was recognized, the common dolphin (*Delphinus delphis*). Some authorities recognized the long-beaked common dolphin as the "Baja neritic" form of common dolphin rather than as a separate species. This recent change in taxonomy has presented difficulties in assessing long-term population or stock changes from surveys and censuses made before the change. Some authorities simply group the two species together as *Delphinus* spp., when discussing earlier work (Carretta *et al.* 2002).

Recent estimates place the population of long-beaked common dolphins in the region at 32,239 for animals in California, Oregon, and Washington (1991–1996 average) (Carretta *et al.* 2002). This species ranges from the coast out to 50 nmi offshore. It usually frequents water less than 28 degrees C. Its geographic range in the region extends from Point Sal, north of Point Conception, to the tropics. It feeds primarily on Pacific hake (*Merluccius productus*) and northern anchovy (*Engraulis mordax*). Both species reportedly feed extensively at night, following the deep scattering layer (Leatherwood *et al.* 1987) although both species have also been observed feeding during the day.

Short-beaked Common Dolphin (Delphinus delphis)

The short-beaked common dolphin population has been estimated at 373,573 for animals in California, Oregon, and Washington (1991–1996 average) (Carretta *et al.* 2002). This species is more widespread in distribution than the long-beaked common dolphin, ranging up to 300 nmi offshore. It feeds on Pacific hake, northern anchovy and market squid (*Loligo opalescens*) (Leatherwood *et al.* 1987).

Bottlenose Dolphin (Tursiops truncatus)

Two stocks of bottlenose dolphins have been distinguished: the California coastal stock and the California-Oregon-Washington offshore stock. The coastal stock ranges from literally in the surf out to approximately 1 kilometer offshore (Carretta *et al.* 2002). During the 1982 to 1983 El Niño event, coastal bottlenose dolphins ventured into central California. They have been reported as far north as San Francisco. Their usual northern limit was once Los Angeles County. Since that time, bottlenose dolphins have remained in the coastal waters of Santa Barbara and San Luis Obispo counties. The southern limit of their range extends at least to Ensenada, Baja California Norte. Despite the extent of their range, the coastal stock is very small, with a mean estimate of only 206 animals (Carretta *et al.* 2002). Coastal bottlenose dolphins feed on fish near the bottom (Leatherwood *et al.* 1987).

In the general region, the offshore stock of bottlenose dolphins frequents the waters off Santa Catalina, San Clemente, and Santa Barbara islands (Carretta *et al.* 2002) as well as the Santa Cruz Basin, which is south of Santa Cruz Island. The offshore stock occasionally ventures into the Santa Barbara Channel, usually in summer. The overall range extends from Mexico to northern California although bottlenose dolphins have been reported off the coasts of Oregon and Washington during influxes of warm water masses to the north.

The overall California-Oregon-Washington stock size is estimated at 956 animals (Carretta *et al.* 2002). The offshore stock feeds on squid as well as fish (Leatherwood *et al.* 1987).

Pacific White-sided Dolphin (Lagenorhynchus obliquidens)

Two forms of Pacific white-sided dolphins have been identified from genetic analyses: a northern form, which usually ranges from Point Conception to Washington and well offshore; and a southern form, which generally ranges from Point Conception to Mexico. Both forms have been found in the SCB, but whether this represents the two forms occupying this area at different times of the year or the two forms intermixing is unknown. Unfortunately, the two forms cannot be distinguished in the field (Carretta *et al.* 2002). At present, both stocks are managed as one.

The population of Pacific white-sided dolphins from Mexico to Washington has been estimated at 25,825 animals in California, Oregon, and Washington (Carretta *et al.* 2002). These dolphins generally frequent waters along the Continental Borderland and slope as well as farther offshore. In the Channel Islands, they are often seen with humpback whales (*Megaptera novaeangliae*), which usually appear in summer and fall. Pacific white-sided dolphins feed primarily on fish (Leatherwood *et al.* 1987).

Striped Dolphin (Stenella coeruleoalba)

The striped dolphin is a pelagic species; that is, it roams far offshore beyond the continental slope some 100 nm seaward of land. The California population may be part of a greater population that extends well into the north Pacific and into Mexico and Central America. The estimated abundance of animals for California, Oregon, and Washington is 20,235 (Carretta *et al.* 2002). The only reports of striped dolphins in Washington and Oregon have been of stranded specimens. The striped dolphin is widely distributed worldwide in tropical to warm temperate waters, often mingling with groups of spotted and spinner dolphins. The best-studied population exists in the eastern tropical Pacific, where incidental takes of these dolphins by the tuna purse seine fleet have been very high (Leatherwood *et al.* 1982; Leatherwood *et al.* 1987).

Northern Right Whale Dolphin (Lissodelphis borealis)

The northern right whale dolphin is the only oceanic dolphin in the region that lacks a dorsal fin. It frequents waters along the Continental Borderland and slope. It prefers cool temperate waters, generally appearing in the region during La Niña events or in areas characterized by vigorous upwelling of colder waters, such as San Nicolas and San Miguel islands. It is most common in winter and spring when the water is colder. In summer and fall, it can range as far north as Oregon and Washington. Its southern range limit is probably northern Baja California. The California population has been estimated at 13,705 animals for California, Oregon and Washington (Carretta *et al.* 2002). Northern right whale dolphins feed on lanternfish, other mesopelagic fish, and squid (Leatherwood *et al.* 1987).

Risso's Dolphin (Grampus griseus)

Risso's dolphins are found throughout the region year-round in varying numbers. They are generally most abundant in the Santa Barbara Channel, particularly off the north shores of the four northern Channel Islands. They are often seen off the coast north of Point Conception. They are often found along the Continental Borderland, slope, and offshore. They range from at least northern Baja California to Washington. The stock size is approximately 16,483 animals in California, Oregon, and Washington (Carretta *et al.* 2002). A distinctly separate stock appears to exist in the Gulf of California and southern tip of Baja California.

Prior to the El Niño event of 1982 to 1983, Risso's dolphins were relatively uncommon in the region. Following this event, however, they were consistently seen in sizable numbers. At least one researcher has suggested that these animals may have occupied a niche vacated by short-finned pilot whales during the 1982 to 1983 El Niño event or that Risso's dolphins appeared during the El Niño event and competed so successfully that most of the pilot whales left the region (Shane 1994).

Short-finned Pilot Whale (Globicephala macrorhynchus)

As discussed above, short-finned pilot whales disappeared during the 1982 to 1983 El Niño event. Over the past few years, however, progressively more individuals have been seen in the SCB, but they have not returned to their former numbers. At present, the California, Oregon, and Washington population is estimated at 970 individuals (Carretta *et al.* 2002).

Prior to the 1982 to 1983 El Niño event, short-finned pilot whales were reportedly resident off Santa Catalina Island (Shane 1994; Dohl *et al.* 1980). They were also frequently seen in the Santa Barbara Channel, the Santa Cruz Basin, and off Santa Barbara Island. Short-finned pilot whales feed almost exclusively on squid (Leatherwood *et al.* 1987), which may lend some credence to the theory that they were displaced by Risso's dolphins, which also prey heavily on squid (Shane 1994).

Killer Whale (Orcinus orca)

Killer whales found off the California coast are currently referred to as the eastern North Pacific transient stock, the eastern North Pacific offshore stock or the eastern North Pacific resident stock (Carretta *et al.* 2002). The transient and offshore stocks travel as far north as Alaska and as far south as California. At present, the best estimate of the eastern North Pacific transient stock is 336 animals (Carretta *et al.* 2001). The eastern North Pacific offshore stock evidently does not mix with transient and resident stocks that overlap its range. The best estimate of this stock size is 285 animals (Carretta *et al.* 2002).

A stock of resident killer whales exists in the waters of Puget Sound. Until recently, researchers believed these animals stayed in the inland waters of the sound. Some individuals from the inland stock were

identified in the company of transient killer whales off the coast, however, clouding the issue of distinctive stocks. These animals have been seen as far south as Monterey Bay (Carretta *et al.* 2001).

Killer whales feed on fish and other marine mammals (Leatherwood *et al.* 1982). Around the Channel Islands, killer whales have been observed feeding on gray whales (*Eschrichtius robustus*), Pacific harbor seals (*Phoca vitulina richardsi*), and California sea lions (*Zalophus californianus c.*). They have also been observed feeding on fish.

False killer whale (Pseudorca crassidens)

False killer whales inhabit tropical to subtropical waters. Their usual northern range limit along the mainland coast is Baja California, although a few individuals have been reported in the SCB. A few stranded specimens have also been reported (Leatherwood *et al.* 1982; Leatherwood *et al.* 1987). False killer whales are rare off California, so no stock estimates have been projected.

Odontocetes: True Porpoises

A list of true porpoises in the CINMS is provided in Table C-8.

Table C-8. Cetaceans: Odontocetes—True Porpoises in the CINMS

Species	Population or Stock Size	Protected Status	Relative Abundance	Seasonality	Normal Habitat	Water Mass Preference
Dall's Porpoise (*Phocoenoides dalli*)	Stock size: 117,545	Protected under MMPA	Uncommon	Winter and spring	Shelf to well off-shore	Subtemperate waters
Harbor Porpoise (*Phocoena phocoena*) Morro Bay stock	Stock size: 932	Protected under MMPA	Uncommon	Year-round	Point Lobos to Point Conception: Shallow coastal waters	Subtemperate waters

Source: Carretta *et al.* 2002.

Dall's Porpoise (Phocoenoides dalli)

Dall's porpoises frequent waters from the Continental Borderland to well offshore. They prefer cooler temperate waters and are seldom seen if the sea surface temperature is above about 19 degrees C (Leatherwood *et al.* 1982). They are most often seen in the SCB in winter and spring when the water is coldest. During La Niña years, they may roam as far south as northern Baja California (Carretta *et al.* 2002).

The California stock has been estimated at 117,545 animals for California, Oregon and Washington (1991-1996 average) (Carretta *et al.* 2002). Dall's porpoises are among the fastest of small cetaceans, reportedly reaching speeds of up to 22 knots. They feed on fish and cephalopods, mainly at night (Leatherwood *et al.* 1982).

Harbor Porpoise (Phocoena phocoena)

Several stocks of harbor porpoises are recognized, more for management purposes than because of distinct geographic boundaries. A good part of the population frequents waters from about 91 meters into

very shallow water. The Morro Bay stock, which ranges from Point Lobos, in Monterey County, to Point Conception, is estimated at 932 individuals (Carretta *et al.* 2002). Harbor porpoises are rarely seen south of Point Conception. Harbor porpoises feed on benthic and schooling fish and invertebrates (Leatherwood *et al.* 1982).

Odontocetes: Sperm Whales

A list of sperm whales in the CINMS is provided in Table C-9.

Table C-9. Cetaceans: Odontocetes—Sperm Whales in the CINMS

Species	Population or Stock Size	Protected Status	Relative Abundance	Seasonality	Normal Habitat
Sperm Whale (*Physeter macrocephalus*)	Stock size: 1,640	Protected, depleted, strategic under MMPA. Endangered under ESA	Rare	April to mid June and August to mid November	Deep sea
Pygmy sperm whale (*Kogia breviceps*)	Stock size: 4,746	Protected under MMPA	Uncommon	Unknown	Deep sea, pelagic
Dwarf sperm whale (*Kogia simus*)	Unknown	Protected under MMPA	Known from three strandings	Unknown	Deep sea, pelagic

Source: Carretta et al. 2002.

Sperm Whale (Physeter macrocephalus)

Sperm whales are classified as endangered under the ESA, as a strategic stock under the MMPA, and depleted under the MMPA. For management purposes, the California-Oregon-Washington population is considered one stock, even though sperm whales are distributed as far north as Alaska and the Bering Sea. The California-Oregon-Washington stock is estimated at 1,640 animals (Carretta *et al.* 2002).

Sperm whales inhabit deep ocean waters well offshore and have rarely been reported in the Santa Barbara Channel. At least two strandings of sperm whales have been reported for the northern Channel Islands. One specimen, which washed ashore at San Miguel Island, was entangled in a nylon fishing net. Sperm whales appear to be most abundant from April to mid-June and from late August to mid-November, although they have been reported year-round. At least some individuals are residents in California waters. Another resident population exists in the Gulf of California (Carretta *et al.* 2002). Sperm whales can dive to depths of at least 3,000 meters, staying down over an hour, so they may be under-reported. They feed almost exclusively on squid (Leatherwood *et al.* 1982).

Pygmy sperm whale (Kogia breviceps)

Little is known about this whale because it inhabits deep pelagic waters, with little vessel traffic. Also, the pygmy sperm whale is quite small, reaching only up to 3.4 meters in length and is not conspicuous while on the surface. Finally, it can stay down for considerable periods.

Originally, the California population of pygmy sperm whales was estimated at 2,993. It is very difficult to distinguish between pygmy and dwarf sperm whales (please see below) at any distance, however, so sightings of such animals were simply recorded as *Kogia* sp. The number of dwarf sperm whales was

derived from the total sightings of *Kogia* sp. at 1,813. However, no dwarf sperm whales have been reported since the early 1970s in California, so researchers now assume that the 1,813 animals listed as dwarf sperm whales were very likely pygmy sperm whales, bringing the total to 4,746 animals (Carretta *et al.* 2002).

At least two pygmy sperm whales have stranded within the study area. Strandings have also been reported along other parts of the California coast as well as in Oregon and Washington.

Pygmy sperm whales feed on squid, crabs and benthic fish beyond the Continental Borderland (Leatherwood *et al.* 1982).

Dwarf sperm whale (Kogia simus)

The dwarf sperm whale was recognized as a different species from the pygmy sperm whale in 1966 (Handley 1966), thus observations made before then do not differentiate between the two species. In any case, no recent observations of this species have been recorded. Only three strandings have occurred in California, all many years ago.

The dwarf sperm whale occupies the same deepwater realm as the pygmy sperm whale and feeds on the same type of organisms (Leatherwood *et al.* 2002). Because of its small size, long submergence periods and cryptic behavior while on the surface, very little is known of this species even in areas where it regularly occurs.

Odontocetes: Mesoplodont Beaked Whales

A list of mesoplodont beaked whales in the CINMS is provided in Table C-10.

Table C-10. Cetaceans: Odontocetes—Mesoplodont Beaked Whales in the CINMS

Species	Population or Stock Size	Protected Status	Relative Abundance	Seasonality	Normal Habitat
Blainville's beaked whale (*Mesoplodon densirostris*)	Stock size: 360	Protected under MMPA	Uncommon	Unknown	Deep water
Hubb's beaked whale (*Mesoplodon carlhubbsi*)	Collective stock size: 3,738	Protected under MMPA	Uncommon	Unknown	Deep water
Ginkgo-toothed whale (*Mesoplodon ginkgodens*)	Collective stock size: 3,738	Protected under MMPA	Uncommon	Unknown	Deep water
Perrin's beaked whale (*Mesoplodon perrini*)	Collective stock size: 3,738	Protected under MMPA	Uncommon	Unknown	Deep water
Stejneger's beaked whale (*Mesoplodon stejnegeri*)	Collective stock size: 3,738	Protected under MMPA	Uncommon	Unknown	Deep water

Source: Carretta *et al.* 2002.

Five species of beaked whales of the Genus Mesoplodon have been reported in the region. All are deepwater species that are cryptic in their behavior. Moreover, they remain submerged for long periods. Finally, they are virtually impossible to distinguish in the field. Most positive identifications have come from specimens killed in domestic drift nets and from stranded specimens. Considering these difficulties, all five species are treated as one unit for management purposes. Although the management stock is said to include California, Oregon and Washington, the only sightings available are from California waters (Carretta *et al.* 2002). The best estimate of nonspecific mesoplodonts is 3,738 (Carretta *et al.* 2002).

Blainville's beaked whale (Mesoplodon densirostris)

An estimate of the California-Oregon-Washington stock of Blainville's beaked whale has been made for 360 animals (Carretta *et al.* 2003). One Blainville's beaked whale stranded in Ventura, within the study area (NOAA Fisheries 2003). Another stranded in San Mateo County, California (Leatherwood *et al.* 1982).

Hubb's beaked whale (Mesoplodon carlhubbsi)

One Hubbs' beaked whale stranded in Santa Barbara, within the study area (NOAA Fisheries 2003). Hubbs' beaked whales have stranded from San Diego, California to British Columbia, however, so it is likely that they may be found within the study area. Five Hubbs' beaked whales were observed killed in drift nets during the period 1991-1995 (Carretta *et al.* 2003).

Ginkgo-toothed whale (Mesoplodon ginkgodens)

The ginkgo-toothed beaked whale is known from two strandings: one in Baja California, the other at Del Mar, California (Leatherwood *et al.* 1982). Its presence in the study area is extremely unlikely.

Perrin's beaked whale (Mesoplodon perrini)

Perrin's beaked whale is known from several strandings in Southern California. It has also been reported twice off the Southern California Bight: once near Santa Catalina Island, the other time off San Clemente Island (Leatherwood *et al.* 1982). No other sightings or strandings have been reported, so the presence of this mesoplodont in the Study Area is extremely unlikely.

Originally, the strandings and sightings were attributed to Hector's beaked whale (*Mesoplodon hectori).* Recent studies of the DNA of the stranded specimens revealed marked differences from Hector's beaked whale, however, leading marine mammalogists John Heyning and James Mead to conclude that the strandings represent a new species of beaked whale that they named Perrin's beaked whale (*Mesoplodon perrini*) (Heyning and Mead 2002).

Stejneger's beaked whale (Mesoplodon stejnegeri)

No Stejneger's beaked whales have stranded south of Monterey, so their appearance in the study area is extremely unlikely. One Stejneger's beaked whale was killed in a drift net off California in 1994 (Carretta *et al.* 2002).

Odontocetes: Other Beaked Whales

A list of other beaked whales in the CINMS is provided in Table C-11.

Table C-11. Cetaceans: Odontocetes—Other Beaked Whales in the CINMS

Species	Population or Stock Size	Protected Status	Relative Abundance	Seasonality	Normal Habitat
Baird's beaked whale (*Berardius bairdii*)	Stock size: 370	Protected under MMPA	Uncommon	Unknown	Slope
Cuvier's beaked whale (*Ziphius cairostris*)	Stock size: 5,870	Protected under MMPA	Uncommon	Unknown	Deep water

Source: Carretta *et al.* 2002

Baird's beaked whale (Berardius bairdii)

Baird's beaked whales are found along the slope and deep waters of the eastern North Pacific. They have been seen most frequently from late spring to early fall, leading researchers to theorize that they may venture farther offshore or to other regions for the winter. These whales are deep divers, staying down for considerable periods, thus it is not surprising that they are sighted only infrequently. Unlike the mesoplodonts, however, Baird's beaked whales are sizable creatures, attaining some 12 meters in length. Perhaps because of this, sightings of Baird's beaked whales, though uncommon, are still more numerous than mesoplodont sightings. The population of the California-Oregon-Washington stock is estimated at 370 animals (Carretta *et al.* 2002).

Baird's beaked whales enjoy a cosmopolitan diet of deep-sea fish and cephalopods, as well as rockfish, mackerel, sardines, crustaceans, and sea cucumbers (Leatherwood *et al.* 2002).

Cuvier's beaked whale (Ziphius cavirostris)

Like the mesoplodonts, Cuvier's beaked whales inhabit offshore waters along the slope and deep ocean. They are deep divers, staying down for extended periods. Cuvier's beaked whales can grow larger than the mesoplodonts found in the region, but other than that, they are difficult to positively identify unless the observer is reasonably close, in good sea conditions. The best estimate of the California-Oregon-Washington population is 9,163, but this is based on sightings in California only and is likely conservative (Carretta *et al.* 2002).

Cuvier's beaked whale preys primarily on deep-sea fish and squid (Leatherwood *et al.* 2002).

Mysticetes: Right Whales

A list of right whales in the CINMS is provided in Table C-12.

Table C-12. Cetaceans: Mysticetes—Right Whales in the CINMS

Species	Population or Stock Size	Protected Status	Relative Abundance	Seasonality	Normal Habitat
Northern right whale (*Eubalaena glacialis*)	Not available for region	Protected, and strategic under MMPA Endangered under ESA	Extremely rare	Unknown	Coastal

Note: ESA – Endangered Species Act; MMPA – Marine Mammal Protection Act
Source: Angliss et al. 2001

Northern Right Whale (Eubalaena glacialis)

Right whales are the most endangered of all the world's whales, having been hunted relentlessly in the seventeenth, eighteenth and nineteenth centuries. They are currently listed as endangered under the ESA, and depleted, protected, and strategic under the MMPA. The historic range of this species was thought to be the entire West coast, from the Bering Sea to Baja, Mexico. The pre-exploitation size of the stock was 11,000 animals. A current population estimate for the entire North Pacific is 100-200 animals (Kreitman and Schramm 1995), and it is doubted whether the species will remain extant. Recent sightings have ranged from Baja, Mexico, to Bristol Bay, Alaska, and there has been one sighting reported in the Santa Barbara Channel in 1981 (Scarff 1986).

Northern right whales are baleen whales and feed primarily on the surface by skimming zooplankton-rich patches of surface water. They have occasionally been seen bottom feeding in shallow water (Kreitman and Schramm 1995).

Mysticetes: Gray Whales

Information about gray whales in the CINMS is provided in Table C-13.

Table C-13. Cetaceans: Mysticetes—Gray Whales in the CINMS

Species	Population or Stock Size	Protected Status	Relative Abundance	Seasonality	Normal Habitat
California gray whale (*Eschrichtius robustus*)	Population: 26,635	Protected under MMPA	Common	December through May; rarely rest of year	Coastal

Notes: MMPA – Marine Mammal Protection Act
Source: Rugh *et al.* 1999.

California Gray Whale (Eschrichtius robustus)

Of the large baleen whales, the California gray whale is the only species that has been delisted from the Federal Endangered Species List; this occurred in 1994. Its population was last estimated in 1998 at 26,635 animals (Rugh *et al.* 1999).

Every year, the California gray whale migrates south from its winter feeding grounds in Alaska and the Bering Sea. Small numbers sometimes straggle from the Bering or Chukchi seas down the coast of Asia. In the past, such animals were considered a separate stock called the Korean or western Pacific stock (Leatherwood *et al.* 1982).

The vast majority of the California gray whale population begins to appear in the SCB in late December. However, individuals or small groups are often seen migrating south as early as October and November. Most of the southbound whales have passed the region by the end of February, but a few stragglers are sometimes seen later.

The northbound migration begins in February, and by the middle of the month, both south- and northbound animals may be seen in the SCB. When the northbound migration is in full swing, killer whales are most often seen in large numbers in the region. Attacks on gray whale calves and juveniles have been documented during this period. The northbound migration generally continues into May, with mother-calf pairs becoming most abundant in April. In the SCB, California gray whales are believed to utilize two main migration corridors, with several smaller corridors. The majority of both north- and southbound whales pass among the Channel Islands during both migrations. Smaller numbers pass near the mainland coast of the SCB, with greater numbers being seen during the northbound migration (Carretta *et al.* 2000; Howorth 1998). Gray whales have been reported for every month of the year, with occasional individuals lingering in the area over the summer.

Gray whales have been seen by several reliable observers feeding in drifting patches of giant kelp offshore, on isopods in established kelp beds, on mole crabs (*Emerita analoga*) in the surf, and on amphipods off shallow sandy sea floors (Anderson 1998, DeLong 1998). Still, such feeding seems largely opportunistic, and the whales generally keep moving as they feed. Migrational feeding activities are more often observed during the northbound migration, perhaps because more whales pass close to the mainland coast where they can be more readily observed.

Mysticetes: Rorquals

A list of rorquals in CINMS is provided in Table C-14.

Blue Whale (Balaenoptera musculus)

Blue whales are listed as endangered under the ESA. They are considered depleted, and the California-Mexico stock is listed as strategic under the MMPA.

A best estimate of this stock size is 1,940 animals, based on line transect aerial surveys and mark-recapture studies in which identification photographs are taken of individual whales over time (Carretta *et al.* 2002). Since 1989, blue whales have been appearing in numbers in the Santa Barbara Channel. Prior to that time, blue whale sightings were sporadic. Although blue whales have been reported at or near the region every month of the year, they generally arrive in early to mid-June and remain until August or September. Sometimes a number of individuals linger as late as November or even December. When blue whales are present in numbers in the Santa Barbara Channel, some 100 individuals may be in the area at one time. These animals seem to stay for several days or more than a week, then move on as others fill their place. The Santa Barbara Channel has prodigious quantities of krill, mainly *Euphausia pacifica*, upon which the blue whales feed.

Blue whales also frequent the Gulf of the Farallones and areas offshore from Monterey Bay in the latter part of summer and early fall. Some individuals travel into Oregon and Washington, but the California-Mexico stock does not appear to journey to Alaska. In late fall and winter, the California-Mexico blue whale stock stays off the coast of Mexico and Central America. Some venture into the Gulf of California, while others travel to the oceanic islands and to the Costa Rica Dome (Calambokidis and Steiger 1997). Little is known about the migration route from Central America and Mexico to California and back. From very limited observations and from a few satellite tags, it appears as though blue whales travel

across wide expanses of deeper water offshore, then appear from west of San Nicolas Island across to Santa Rosa and San Miguel islands, entering and leaving the Santa Barbara Channel from the west.

Table C-14. Cetaceans: Mysticetes—Rorquals in the CINMS

Species	Population or Stock Size	Protected Status	Relative Abundance	Seasonality	Normal Habitat
Blue whale (*Balaenoptera musculus*)	Stock size: 1,940	Protected, depleted and strategic under MMPA Endangered under ESA	Common in season	June to September; occasionally through November	Shelf and slope
Fin Whale (*Balaenoptera physalus*)	Stock size: 1,851	Protected, depleted and strategic under MMPA Endangered under ESA	Uncommon	Summer, fall; possible year-round	Shelf and slope
Sei whale (*Balaenoptera borealis*)	Not available for region	Protected, depleted and strategic under MMPA Endangered under ESA	Very rare	No longer known	Oceanic
Bryde's whale (*Balaenoptera edeni*)	Stock size: 12	Protected under MMPA	Rare	Warm water months	Shelf and slope
Minke whale (*Balaenoptera acutorostrata*)	Stock size: 631	Protected and strategic under MMPA	Uncommon	Year-round; Most abundant in summer and fall	Coastal to slope
Humpback whale (*Megaptera novaeangliae*)	Stock size: 856	Protected, depleted and strategic under MMPA Endangered under ESA	Common in season	May to September	Shelf and slope

Note: ESA – Endangered Species Act; MMPA – Marine Mammal Protection Act
Source: Carretta *et al.* 2002.

Fin Whale (Balaenoptera physalus)

Fin whales are listed as endangered under the ESA. They are considered depleted and strategic species under the MMPA. The California-Oregon-Washington management stock is considered strategic. Population estimates of fin whales vary, but based on 1991 and 1993 ship surveys, an estimate has been made of 1,851 fin whales for this stock (Carretta *et al.* 2002). At least 148 fin whales have been photo-identified in the Gulf of California. Whether these animals are resident or are part of the California-Oregon-Washington stock is unknown at this time. Fin whale abundance dwindles off the coasts of California and Oregon in winter and spring, while it increases during the same period in the Gulf of

California. This may be coincidence, however (Carretta *et al.* 2002). At least part of the population appears to spend winter and spring well off the southern California coast down to Mexico.

Fin whales are more cosmopolitan in their diet, feeding on krill, copepods, squid, and even small schooling fish (Leatherwood *et al.* 1982). They have been observed in the Santa Barbara Channel near feeding aggregations of blue and humpback whales. These individuals were feeding on the same prey, *Euphausia pacifica*, a species of krill.

Sei Whale (Balaenoptera borealis)

Sei whales are listed as endangered under the ESA and are considered depleted and strategic under the MMPA. Once commonly taken by whalers off the California coast in the 1950s and 1960s, sei whales are now quite rare (Daugherty 1985). Several extensive aerial and ship surveys from 1991 through 1993 revealed only one confirmed sighting of a sei whale (Carretta *et al.* 2002).

Bryde's Whale (Balaenoptera edeni)

Bryde's whales are common throughout the eastern tropical Pacific and are the most common balaenopterid in the Midriff region of the Gulf of California. There, 140 individuals have been photo-identified. During extensive ship and aerial surveys off California from 1991 through 1994, five possible observations of Bryde's whales were made. Bryde's whales are rare off California. The population is estimated at 12 individuals in California, Oregon, and Washington coastal waters (Carretta *et al.* 2002). The minimum overall population in the eastern tropical Pacific has been estimated at 11,163 animals. Bryde's whales seem to prefer small schooling fish in their diet, including pilchards, anchovies, herring, and mackerel. They also feed on euphausiids (Leatherwood *et al.* 1982).

Minke Whale (Balaenoptera acutorostrata)

Minke whales are not listed under the ESA, nor are they considered depleted under the MMPA. The stock size is estimated at 631 individuals based on ship surveys in 1991, 1993, and 1996 (Carretta *et al.* 2002). Minke whales occur year-round in the region, from relatively shallow coastal areas to shelves off the north shore of the four northern Channel Islands. They appear to be most abundant from late spring through late summer although they are never seen in large numbers. Feeding activities are generally associated with small schooling fish, although they may also eat euphasiids.

Humpback Whale (Megaptera novaeangliae)

Humpback whales are endangered under the ESA and depleted and strategic under the MMPA. This particular stock is officially called the California-Oregon-Washington-Mexico stock. In reality, this stock ranges from at least Costa Rica to British Columbia. It does not mingle with the Alaska stock. Various estimates have been made for the California-Mexico stock. The most reliable estimate, obtained by mark-recapture photo-identification methods, was 856 animals (Carretta *et al.* 2002).

In winter, this stock congregates near oceanic islands off Mexico and Central America, with at least some individuals at the Costa Rica Dome. Humpback whales usually begin to appear in the region by late May and early June (Calambokidis *et al.* 2000). They generally stay until August or September. Humpback whales may stay as late as November in the western reaches of the Santa Barbara Channel. Like the blue whales, the humpback whales travel into central California in summer and early fall, occupying much the same areas. Little is known about the movements of humpback whales between Central America and Mexico to the western coastal United States, but their movements may be similar to those of the blue whales.

Although humpback whales in the region feed primarily on krill, particularly *Euphausia pacifica*, they have also been observed feeding on northern anchovies (*Engraulis mordax*), Pacific sardines (*Sardinops sagax coeruleus*), and on various small fish and amphipods in drifting patches of giant kelp (Leatherwood *et al.* 1982; Croll *et al.* 1999).

1.2.7.2 Pinnipeds

Pinnipeds depend on haulout and rookery sites throughout the Channel Islands (Figure C-4). Historically, six species of pinnipeds have occurred in the northern Channel Islands. These include four members of the family Otariidae and two representatives of the family Phocidae. Two of the six species that have occurred in the Sanctuary are listed as threatened under the ESA.

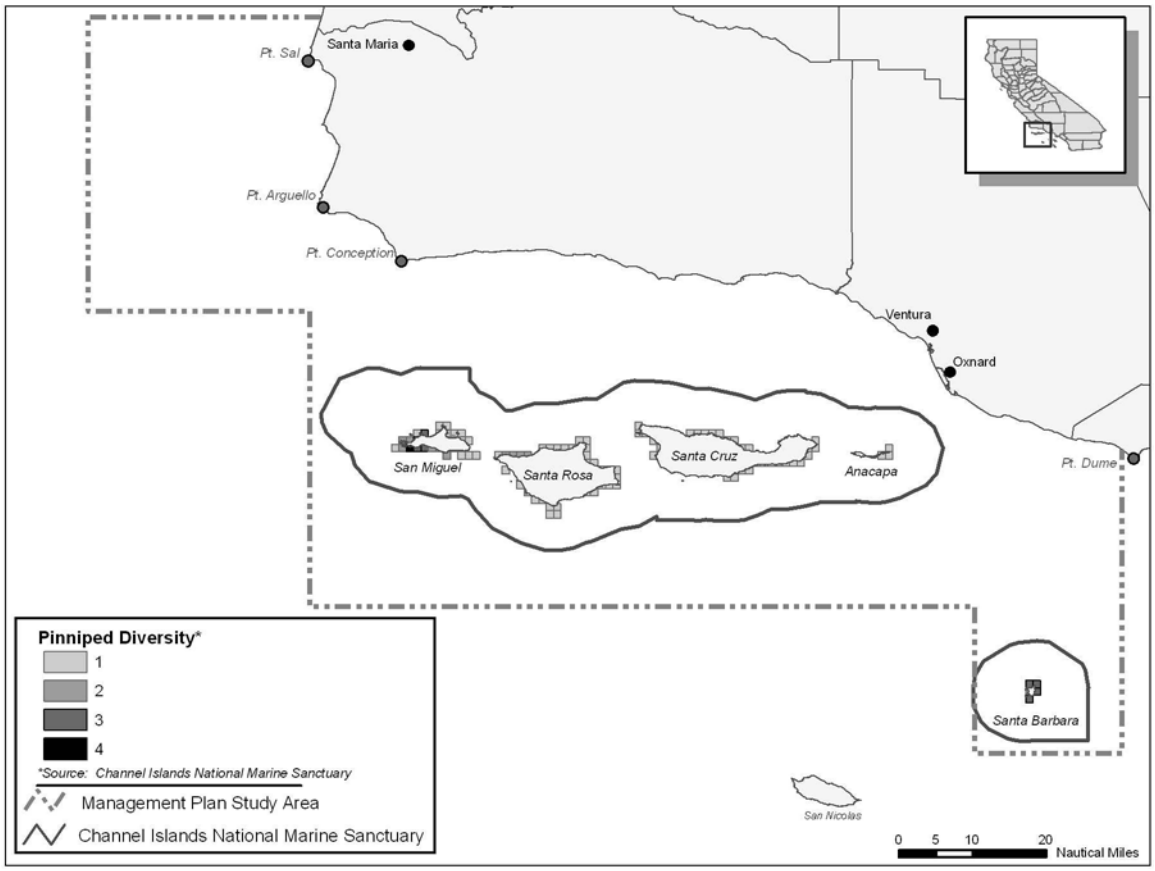

Figure C-4. Pinniped Diversity at Haul-Out and Rookery Sites in the CINMS

Of the otariid seals, the California sea lion (*Zalophus californianus c.*) is the most abundant (Carretta *et al.* 2002). The Steller sea lion (*Eumetopias jubatus*) had two rookeries on San Miguel Island, but these rookeries have not been occupied since the 1982 to 1983 El Niño event. The eastern stock of Steller sea lions is listed as threatened under the ESA. The northern fur seal (*Callorhinus ursinus*) has two rookeries on San Miguel Island. The Guadalupe fur seal (*Arctocephalus townsendi*) has been reported on San Nicolas and San Miguel islands in very small numbers, usually from one to three individuals. A few strandings have occurred along the mainland coast (Hanni *et al.* 1997). The Guadalupe fur seal is listed as threatened under the ESA and CESA and is also fully protected under the Fish and Game Code (section 4700).

Of the phocid seals, the northern elephant seal (*Mirounga angustirostris*) is the most common, with rookeries at San Miguel, Santa Rosa, San Nicolas, and Santa Barbara islands (Carretta *et al.* 2002). The Pacific harbor seal (*Phoca vitulina richardsi*) is common throughout the Channel Islands, with numerous haulout and rookery sites throughout the Channel Islands and along the mainland coast (Carretta *et al.* 2002). The ribbon seal (*Histriophoca fasciata*), an arctic species, has been reported twice in California (Daugherty 1985; Santa Barbara Museum of Natural History 2003).

Otariids

A list of otariids in CINMS is provided in Table C-15.

Table C-15. Pinnipeds: Otariids—Eared Seals in the CINMS

Species	Population or Stock Size	Protected Status	Relative Abundance	Seasonality	Normal Habitat	Water Mass Preference
California sea lion (*Zalophus californianus c.*)	Stock Size: 204,000 to 214,000	Protected under MMPA	Common	Year-round	Coastal	Tropical to temperate
Steller sea lion (*Eumetopias jubatus*)	31,005	Protected and strategic under MMPA Threatened under ESA	Now extremely rare	Formerly summer and fall	Coastal	Subtemperate to subpolar
Northern fur seal (*Callorhinus ursinus*)	Stock size: 4,336	Protected under MMPA	Uncommon	May to November	Pelagic	Subtemperate to subpolar
Guadalupe fur seal (*Arctocephalus townsendi*)	Population: 7,408	Protected, depleted, and strategic under MMPA Threatened under ESA	Rare	Summer and fall	Pelagic	Subtropical to temperate

Note: ESA – Endangered Species Act; MMPA – Marine Mammal Protection Act
Source: Carretta *et al.* 2002.

California Sea Lion (Zalophus californianus c.)

The California sea lion consists of three subspecies: *Zalophus californianus japonicus*, which occurred off Japan and is now thought to be extinct; *Zalophus californianus wollebaeki*, found at the Galapagos Islands; and *Zalophus californianus californianus*, found from Baja California to British Columbia. The latter population is divided into three stocks. The range of the Gulf of California stock is as indicated by the name; the western Baja California stock extends from the southern tip of Baja California to the California border; and the U.S. stock ranges from California through Washington. The United States stock size has been estimated at 204,000 to 214,000 animals (Carretta *et al.* 2002).

California sea lions have two main rookeries at the Channel Islands, one at San Miguel Island, the other at San Nicolas Island. Other rookeries exist at Santa Barbara and San Clemente islands. Several haul-out sites exist on Santa Cruz and Anacapa islands. California sea lions are a coastal species, seldom venturing much past the Continental Borderland. Adult male California sea lions usually haul out from May into early August to defend their beach territories and breed. After mating, they head north, some

reaching as far as British Columbia. The females linger with their pups, which are weaned at 4 to 10 months. Some continue to nurse for up to a year.

The females generally stay at the island haulout sites or near the mainland coast as far north as Monterey, as do the juveniles. A few adult males also linger in this region. California sea lions feed on small schooling fish and market squid (*Loligo opalescens*).

Steller Sea Lion (Eumetopias jubatus)

Steller sea lions were reclassified into two separate stocks within United States waters in 1997: the eastern stock, including animals east of Cape Suckling, Alaska (144 degrees west longitude); and the western stock, including animals at and west of Cape Suckling. The eastern stock of Steller sea lions is threatened under the ESA, while the western stock is endangered because of major population declines. Both populations are now considered strategic and depleted. Reduced prey stocks from overfishing during critical times and locations resulted in the decimation of the western population (NMFS 2000). Regionally, the 1982–1983 El Niño event may have contributed to the decline of this species (Angliss *et al.* 2001).

The most recent abundance estimate of the eastern stock of Steller sea lions is based on combined surveys conducted in Southeast Alaska (15,173 animals), British Columbia (9,277), and Washington, Oregon and California (6,555). Combining the total count for the three regions results in a minimum estimated abundance of 31,005 Steller sea lions (Angliss *et al.* 2001). Trends in Steller sea lion abundance for the three regions have been slightly variable over the past two decades. Steller sea lion numbers in California, especially southern and central California, have declined considerably, from 5,000 to 7,000 non-pups from 1927–1947 to 1,500 non-pups between 1980 and 1998 (Angliss *et al.* 2001).

Critical habitat for the Steller sea lion was established in 1993 (58 FR 45269) and includes all major rookeries for the eastern stock. In California, rookeries at Año Nuevo Island, Southeast Farallon Islands and Sugarloaf Island, off Cape Mendocino, are considered critical habitat (NMFS 2000). Año Nuevo Island, the closest critical habitat to the SCB and the southernmost breeding site for this species, is hundreds of miles to the north in Santa Cruz County. No critical habitat exists for this species in the SCB (NMFS 2000).

The Steller sea lion was last reported at San Miguel Island during the 1982–1983 El Niño (NMFS 1992 and 2000). Historically, Steller sea lions have been seen occasionally at San Nicolas Island but have not been observed there for decades (Bartholomew 1951; Bartholomew and Boolotian 1960). Steller sea lions once appeared in early summer and remained into the fall at San Miguel Island. A similar pattern continues at the Año Nuevo Island colony. Steller sea lions prefer cold temperate waters.

Steller sea lions feed on a variety of fish, including the walleye pollock or black cod *(Theragra chalcogramma)*, once a major prey item (Angliss *et al.* 2001; NMFS 1992 and 2000).

Northern Fur Seal (Callorhinus ursinus)

The northern or Alaskan fur seal has two rookeries of approximately 4,500 animals at San Miguel Island. These were reestablished in the late 1950s. The two rookeries have grown over the years to an estimated 4,336 animals (Carretta *et al.* 2002). At San Miguel Island, adult males usually arrive in May and stay through August. Some will stay as late as November, along with the females, although they will not maintain territories much beyond August. By November, most adults have left for the open ocean, where they will spend the next seven to eight months. Many pups will spend the next 22 months at sea after

they have been weaned, finally returning to the rookeries where they were born. Northern fur seals are pelagic, frequenting offshore waters in search of fish and squid.

Guadalupe Fur Seal (Arctocephalus townsendi)

The Guadalupe fur seal is listed as threatened under the ESA. It is considered depleted under the MMPA and is also fully protected under Fish and Game Code (section 4700). The California-Mexico stock is considered strategic under the MMPA. The latest estimate of this population is 7,408 animals (Carretta *et al.* 2002), virtually all of which are found in Mexican waters at Guadalupe Island. A pup was born on San Miguel Island in 1997 (Melin and DeLong 1999).

Phocids

A list of phocids is provided in Table C-16.

Table C-16. Pinnipeds: Phocids—True Seals in the CINMS

Species	Population or Stock Size	Protected Status	Relative Abundance	Seasonality	Normal Habitat
Northern elephant seal (*Mirounga angustirostris*)	Stock size: 101,000	Protected under MMPA	Common in season	December to August	Deep benthic
Pacific harbor seal (*Phoca vitulina richardsi*)	Stock size: 30,293	Protected under MMPA	Common	Year-round	Coastal
Ribbon seal (*Histriophoca fasciata*)	Not applicable	Protected under MMPA	Extremely rare	Not applicable	Arctic

Note: MMPA – Marine Mammal Protection Act
Sources: Carretta *et al.* 2002, Santa Barbara Museum of Natural History 2003, Daugherty 1985.

Northern Elephant Seal (Mirounga angustirostris)

The California population is considered a separate stock (Carretta *et al.* 2002). Northern elephant seals have two large rookeries on San Miguel and San Nicolas islands. Smaller rookeries are found on Santa Barbara and Santa Rosa islands. They have also been reported at Santa Cruz and Anacapa islands but have not established rookeries there. The California stock was estimated at 101,000 animals in 1996 (Carretta *et al.* 2002).

Northern elephant seals migrate to California twice from feeding grounds as far north as the Aleutian Islands and the Gulf of Alaska (for the males) and to areas off the Oregon coast (for the females). They migrate once to bear their young and breed, then a second time to molt. The pupping and breeding season extends from December through March. The molting season is between March and August. Males generally arrive later than the females. Northern elephant seals feed on deepwater organisms including bony fish, sharks, skates, rays, and squid, and octopus.

Pacific Harbor Seal (Phoca vitulina richardsi)

Two subspecies of harbor seals exist in the Pacific, *Phoca vitulina stejnegeri*, which is found in the western Pacific and in northern Japan and *Phoca vitulina richardsi*, which ranges from the Pribilof Islands in the Bering Sea to Baja California. The Pacific harbor seal is well distributed in California, with 400 to 500 haulout sites along the mainland coast at river mouths, estuaries, beaches, offshore rocks, and islands, including San Francisco Bay, as well as at the Channel Islands. Harbor seals usually do not roam far from their haulout and rookery areas, although a few individuals may wander a few hundred kilometers. The best estimate of the California stock is 30,293 animals (Carretta *et al.* 2002).

Harbor seals pup from February through May. Some pups have been reported in December and January at several rookeries. The most animals can be seen ashore at the Channel Islands during the molting season, which peaks from late May to early June. Harbor seals prey mostly on various species of bottom fish and octopi.

Ribbon seal (Histriophoca fasciata)

Please see note under Pinnipeds, above.

1.2.7.3 Mustelids

The southern sea otter is the only member of the mustelid family that occurs in the CINMS. It is described below and listed in Table C-17.

Table C-17. Mustelids – Sea Otters in the CINMS

Species	Population or Stock Size	Protected Status	Relative Abundance	Seasonality	Normal Habitat
Southern sea otter (*Enhydra lutris nereis*)	Stock size: 2,505	Protected, depleted, and strategic under MMPA Threatened under ESA Fully Protected under California State Law	Most abundant in spring in region	Year round	Coastal

Note: ESA – Endangered Species Act; MMPA – Marine Mammal Protection Act
Source: USGS 2003.

Southern Sea Otter (Enhydra lutris nereis)

The southern sea otter is listed as threatened under the federal ESA, is considered depleted and strategic under the MMPA, and listed as Fully Protected under California state law. 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 U.S. Geological Survey (USGS 1999, 2001) has shown declines in the population of California sea otters following El Niño events. USGS observers tallied a total of 2,692 California sea otters for the 2006 spring survey. The 2006 total showed a 1.6% decrease in sea otters from the 2005 count of 2,735. It is the second year of small decreases in abundance since a record-high number of sea otters that were observed in spring 2004 (USGS 2006). The latest three-year running average – the average of the totals from the spring counts of 2004, 2005, and 2006 – is up 2.3% over the previous average, to 2,751 sea otters. While no single year's survey result is indicative of a population change, researchers and managers remain concerned at the overall slow rate of growth for the threatened California sea otter. Cooperative research efforts are ongoing to try to understand why the otter's recovery has been so slow (USFWS 2005).

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 Coho Reef in the Study Area north to Año Nuevo Island, in Santa Cruz County (USFWS 2005). This population is concentrated near the coast in waters up to about 20 meters deep, although some otters can be found out to about 40 meters of water depth. Few otters have been sighted north of Año Nuevo Island, where the northward spread seems to have stopped. Predation by great white sharks (*Carcharodon carcharias*) likely has contributed to the cessation of range expansion to the north (Ames *et al*. 1996).

From 1987 to 1990, the USFWS, which has primary jurisdiction over sea otters, translocated 140 otters to San Nicolas Island. The translocation effort has not been considered a success. In 2004 only 32 otters (excluding dependent pups) were counted at the Island (USFWS 2005). Whether these animals are part of the translocated stock, offspring from the translocated stock, others that have moved there, or a combination of these possibilities, is unknown (Sanders 2003). Following the translocation, there have been few sightings of sea otters in the Sanctuary (USFWS 2005). 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. The USFWS (2005) notes that the sea otter range is naturally expanding in the SCB, and is expected to expand along the mainland coastline towards the city of Santa Barbara over the next ten years. While sea otters have not yet recolonized areas within the Sanctuary, they would likely eventually reestablish their range within Sanctuary boundaries, but are not expected to have an effect on the Sanctuary within ten years (USFWS 2005). (More information about termination of the sea otter translocation program is provided in the FMP's (Vol. I) Resource Protection Action Plan.)

Southern sea otters eat certain mollusks, crustaceans, and echinoderms. Unlike Alaskan otters, they do not appear to eat fish.

Sea otters can be sensitive to runoff into the nearshore marine environment. Research is showing that the parasite *Toxoplasma gondii*, which affects a wide variety of hosts (including humans), is a major cause of mortality and contributor to the slow rate of population recovery for southern sea otters in California. An analysis by Conrad *et al*. (2005) showed that 52% of 305 freshly dead, beachcast sea otters and 38% of 257 live sea otters sampled along the California coast from 1998 to 2004 were infected with *T. gondii*. Conrad *et al*. (2005) found that areas with high *T. gondii* exposure were predominantly sandy bays near urban centers with freshwater runoff, and suggested that the most likely source of infection is by infectious, environmentally resistant oocysts (a dormant yet infectious form of some protozoan parasites) that are shed in the feces of felids (cats) and transported via freshwater runoff into the marine ecosystem.

1.2.7.4 Special-Status Marine Mammal Species

The federal Endangered Species Act (ESA) provides measures to conserve and recover listed species. NMFS is charged with implementation of the ESA for all marine mammals in the SCB except the southern sea otter, which is handled by the USFWS. Section 7 of the ESA requires that federal agencies ensure that their actions are not likely to jeopardize the continued existence of endangered or threatened species or result in the destruction or adverse modification of the critical habitat of such species. Likewise, the California Endangered Species Act prioritizes the protection and recovery of listed endangered or threatened species and their habitats. The ESA requires NMFS and the USFWS to develop recovery plans for species added to the list of Threatened and Endangered (T&E) species. The Recovery Plans describe conservation measures to ensure recovery of the listed species.

The State also designates protection to one marine mammal under the California Endangered Species Act (CESA). In addition, the California Fish and Game Code (section 4700) designates several marine mammal species as fully protected (northern elephant seal, Guadalupe fur seal, Pacific right whale, and southern sea otter). Fully protected mammals may not be taken or possessed at any time, and no provision may be made to allow incidental take.

Under the ESA, an endangered species is defined as "any species which is in danger of extinction throughout all or a significant portion of its range." Six whale species occurring in California waters are listed as endangered. A threatened species is "any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range." The Steller sea lion, Guadalupe fur seal, and southern sea otter are the only marine mammal species occurring in California waters that are listed as threatened. The Guadalupe fur seal is also listed under the CESA as threatened.

A candidate species is "any species being considered by the Secretary for listing as an endangered or threatened species, but not yet the subject of a proposed rule." There are no candidate marine mammal species found in California waters.

All marine mammals are protected under the Federal Marine Mammal Protection Act (MMPA 1972, amended 1994) administered by NMFS and the USFWS. In addition, NMFS and the USFWS grant at-risk marine mammal stocks additional protection under the ESA with endangered, threatened, and depleted status designations. The MMPA also provides designations for at-risk marine mammal stocks. A species or a stock of a species is designated as depleted when it falls below its Optimum Sustainable Population (OSP) or, if the species is listed under ESA. Six whale species and the southern sea otter are considered depleted. The MMPA also lists a stock as strategic if: 1) it is listed as a T&E species under ESA; or 2) the stock is declining and likely to be listed as threatened under the ESA; or 3) the stock is listed as depleted under the MMPA; or 4) the stock has direct human-caused mortality which exceeds that stock's Potential Biological Removals (PBR) level. The term PBR is defined as "the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its OSP" (Carretta *et al.* 2002). As mandated in the 1994 amendments to the MMPA, NMFS develops estimates of PBR's for each marine mammal stock in U.S. waters.

NMFS issues permits through the Marine Mammal Authorization Program (MMAP) to provide an exception for commercial fishers from the general taking prohibitions of the MMPA. The owner of a vessel or non-vessel gear participating in a Category I or II fishery must obtain authorization from NMFS in order to lawfully incidentally take a marine mammal in a commercial fishery, while those participating in Category III fisheries may incidentally take marine mammals without registering for or receiving an authorization (NMFS/NOAA/OPR 2001). For those species under NMFS' jurisdiction, permits may be

issued for the incidental, but not intentional, taking of marine mammals listed as T&E under the ESA. With the 1994 amendments to the MMPA, intentional takes of marine mammals are now illegal except when imminently necessary in self-defense or to save the life of another person.

2.0 HISTORICAL/CULTURAL RESOURCES

Historical/cultural resources in the Study Area are discussed below including existing data sources and key threats to the resources

2.1 DATA SOURCES

2.1.1 Historical Research

Prior to 1976, when a paper was published by Hudson on marine archaeology in the region, little work had been done in this area. Before the 1950s, probably all the marine finds were made in the intertidal region, and few of these were likely reported (Hudson 1976). The earliest known Chumash stone artifact was found by Orr in a cemetery on Santa Rosa Island; he dated the artifact at about 4,000 years B.P. (1968). It was riddled with borings from marine organisms, both inside and out, indicating that it had been manufactured, somehow deposited in the sea, then later recovered.

In the 1870s, a stone vessel was found during a very low tide near the site of the Chumash village of Syuxtun, near what is now the foot of Bath and Chapala streets in Santa Barbara. This was the first recorded marine discovery in the region. Other artifacts were later found there, eroded out of nearby cemeteries and middens.

In 1928, another vessel was found in Carpinteria, followed two years later by yet another, recorded by Wallace and Kritzman (1956). In 1944, the late Campbell Grant, well-known for his work on Chumash rock art, recovered a bowl at Rincon Point. Two grooved stones were found in Montecito in 1934 and 1937. Other finds were undoubtedly made but never reported (Hudson 1976).

From 1950 on, numerous finds were made throughout much of the Study Area by recreational scuba divers and commercial abalone and sea urchin divers. These finds were enumerated in several comprehensive studies (Hudson 1976; Hudson and Howorth 1985; Howorth and Hudson 1993). During the first study, 26 sites were identified along the mainland coast of the Study Area, and 6 at the four northern Channel Islands. Artifacts from all sites totaled 92 (Hudson 1976).

In the next study, which built on the earlier work, the number of artifacts totaled over 150, while the number of mainland sites had increased to 35. Island sites had increased to 17, not counting an additional 4 sites at San Nicolas Island, which is not in the existing Sanctuary or Study Area (Hudson and Howorth 1985). In the last study, confined to the existing Sanctuary, 18 sites were recorded (Howorth and Hudson 1993). Since then, an additional site was found at the northern Channel Islands. To date, no marine archaeological sites have been found at Santa Barbara Island. Another site was reported for the mainland coast of the Study Area.

Most submerged archaeological finds to date have been fortuitous rather than systematic. Such finds have been made mainly by divers who are not trained archaeologists. Not surprisingly, stone vessels, which are large, relatively indestructible and easily recognizable, comprise the majority of finds. In Hudson's 1976 study, a sampling of 68 artifacts revealed 56 stone vessels, vessel blanks, or basket hopper mortars. Six of the remainder were grooved stones; the others consisted of metates, pestles, donut stones, and scrapers.

In 1961, divers from Scripps Institution of Oceanography investigated a site off Santa Rosa Island and found a large concentration of bowls. In 1974 and 1975, two undersea archaeological expeditions were undertaken in the Study Area through the Santa Barbara Museum of Natural History (Hudson 1976; Hudson and Howorth 1985). The first expedition was to see if a helmet-mounted video camera could allow a topside archaeologist to monitor a systematic diver search of the sea floor. In 1975, a qualified archaeologist, investigating a known submerged archaeological site, did find an artifact. The object was a unifacially worked sandstone tool that a diver not trained in archaeology would have missed (Hudson 1976).

In 1977, a diver-archaeologist performed a systematic search of an area near Point Conception proposed for a liquefied natural gas port, using a line transect survey method. He did not find any artifacts. Later, however, a marine biologist recovered a charmstone from the same area (Hudson 1976; Hudson and Howorth 1985).

These studies show that even trained archaeologists will not necessarily locate artifacts during surveys. The problems of sand or algae covering the material, limited underwater visibility, and numerous other factors limit undersea archaeology.

Hudson (1976) concluded that the sampling of submerged cultural resource sites was biased, based on the following observations:

- The distribution of sites was dependent upon the frequency of diving activities or beachwalkers at low tides;
- Fewer people walked beaches at the Channel Islands;
- Shallow, nearshore areas were visited more frequently by divers than deep-water sites;
- Deep sites were rarely visited because of limited dive times;
- Finds were haphazardly reported;
- Little data were available on geomorphology, such as the presence of ancient streambeds;
- No systematic surveys had been undertaken, at least within the Sanctuary; and
- Remote sensing equipment had not located any submerged sites.

Despite the sampling bias, however, a considerable volume of previously unpublished data on submerged cultural resources sites was revealed in Hudson's 1976 study and in subsequent studies (Hudson and Howorth 1985; Howorth and Hudson 1993).

2.1.2 Contemporary Research on Shipwrecks

A preliminary search of primary source material, contemporary newspaper accounts, survivor diaries, oral interviews, published databases and reports, and popular literature on shipwrecks was conducted. In addition to documenting the shipwreck events, the maritime activities associated with these historic resources must be put into context. Lima (1994) described the process in five steps: (1) identifying vessels lost in an area; (2) gathering data about the vessels; (3) identifying and documenting actual wreck sites; (4) interpreting the research findings; and (5) disseminating the research findings. This same process can be applied to other historic resources, such as aircraft and historic land use sites.

In 1985, research was completed and a report was published by Hudson and Howorth. This report included a review of earlier findings by Pierson and Stickel (1977) Pierson (1980), and Pierson *et al*. (1987). It also included many new findings made by Hudson and Howorth. An updated report was prepared in 1993 (Howorth and Hudson), which listed a total of 105 shipwrecks in the CINMS.

In 1996, Morris and Lima published a submerged cultural resources assessment for CINP. Although this assessment addressed shipwrecks and aircraft losses in Sanctuary waters from 1853 to 1980, it did not include the Study Area, nor did Hudson and Howorth's earlier studies (1985 and 1993). Lima (1999) provided a shipwreck study for publication in an EIS prepared for the U.S. Navy at Point Mugu, California. This publication addressed the complete Study Area, but it only provided each vessel's name, rig, date built, date lost, and how the vessel was lost. It did not include a historical profile for each vessel or detailed circumstances surrounding each loss. Gearhart *et al*. (1990) provided broad historic narratives of the Study Area with some discussion on regional losses, but it did not represent a full assessment of the resources. Four government shipwreck databases provided vessel listings but only limited information on the historical significance of these resources (California State Lands Commission 2000; NOAA 2000a, b; U.S. Navy 2000). Schwemmer and Gamble's shipwreck database (2000) represents an ongoing study of ship and aircraft casualties for the four western states.

2.2 THREATS TO SUBMERGED HISTORICAL/CULTURAL RESOURCES

With the development of underwater technologies that bring the public physically and virtually closer to the marine environment, there is increasing interest in submerged historical/cultural resources (SCRs). Protection and 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 the CINMS is protecting. SCRs provide an excellent historical record to past human behavior patterns and uses in the Sanctuary.

SCRs are subject to irreversible damage and can be severely compromised by human and environmental impacts. Although the Sanctuary allows certain compatible activities, its overriding responsibility is to protect both historical/cultural and natural resources for current and future generations.

To gain a better understanding of the past, researchers strive to study SCRs 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 SCR site.

There are two principal threats to SCRs: human behavior and natural phenomena. While little can be done to minimize the damage 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 SCRs of the Sanctuary requires further research because so few sites have been located and thoroughly surveyed. As such, NOAA recognizes the removal of cultural or historical 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.

2.2.1 Human Threats

Site looting (where objects are intentionally pilfered from submerged sites) is the single largest threat to SCRs. This act has the potential to be more damaging 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 usage and the associated site, or destroy the protective coatings that enabled 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 damage through poor diving techniques or tampering. Divers may inadvertently harm 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 damage to SCRs. An anchor dropped on an artifact can result in serious and permanent damage 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 damaging effects of heavy trawl doors and nets dragging through archaeological sites.

Modern ship groundings can have seriously impacted SCRs in the various sites worldwide. A large vessel that grounds on an archaeological site may destroy and permanently bury historical/cultural 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. Petroleum products that sink can physically smother resources. Due to the increase in carbon, oil contamination from a modern shipwreck may also impede the radiocarbon dating processes.

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 historical resources inventories and avoidance plans with supervised magnetometer and side-scan surveys of the proposed regions.

The laying of oil pipelines and other structures that support offshore oil and gas processing facilities can destroy historical resources. Dredging operations to clear harbor entrances can destroy and/or dislodge submerged archaeological resources, thus losing important clues to their history.

2.2.2 Natural Threats

Although there is little that can be done to protect artifacts from natural processes, the Sanctuary staff recognize these threats and, when possible, will attempt to mitigate their impacts. Most damage to shipwrecks occurs in the first few decades of their sinking. Shipwrecks tend to stabilize with the environment (sustaining fewer damaging effects) after twenty or thirty years.

Shipwrecks in shallow water environments within higher energy zones are much more likely to be subjected to damage 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, therefore limiting physical effects. Cold and deep-water environments tend to have fewer biological processes that accelerate 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.

2.3 OVERVIEW OF HISTORICAL/CULTURAL RESOURCES IN STUDY AREA

Submerged historical/cultural resource sites are abundant within the Study Area. Several theories explain the presence of such sites and are presented in the next section. Erosion is the single largest factor that continues to deposit archaeological material into the marine environment. Wave and streambed erosion, and cliff retreat from wind, runoff and even earthquakes, all result in the deposition of archaeological material into the sea. On the four northern Channel Islands, where such material is abundant in bluff top middens and in burial grounds, the process is inevitable. Given the almost continuous length of insular coastline capped by archaeological remains, one should expect the presence of marine finds almost everywhere offshore of these islands (Hudson and Howorth 1985; Howorth and Hudson 1993). This process also occurs, although to a lesser extent, along the mainland coast of the Study Area south of Point Conception. From Point Conception north, such sites are quite abundant (Lebow 2000). (Hudson and Howorth 1985; Hudson 1976). Throughout the Study Area, such sites are probably under-reported.

Along the mainland coast, most eroding sites lead directly to the intertidal zone, which is subject to the weathering effects of sun, windblown sand, scouring from wave-driven sand, pounding by rock rubble, and direct surf action, in addition to the effects of rock-boring clams and other organisms. Some island sites are also characterized by the same influences. For these reasons, only the hardiest of artifacts, such as stone vessels and pestles, usually survive over time in such areas.

Along some sections of the Channel Islands, however, eroding coastal bluffs are perched over relatively deep, semi-protected waters. Material falling into the sea from such sites is subject only to damage while falling. Once submerged, the material is more prone to damage from biological organisms than from physical impacts. This may account for one diver's find of two vessels, a doughnut stone, a scraper, and some human bones (Hudson 1976).

A few other areas have yielded small concentrations of Chumash artifacts. At Santa Cruz and Santa Rosa islands, a number of stone vessels were reported in two separate sites (Hudson 1976; Morris 2000). Along the mainland coast, repeated finds have been made in two intertidal and four subtidal sites (Anderson 2000; Hudson 1976; Hudson and Howorth 1985). The remainder of finds has been widely dispersed and almost always involved single artifacts (Hudson 1976; Hudson and Howorth 1985).

Historical/cultural resources include shipwrecks, aircraft wrecks, and material associated with ocean piers. In many of the historical/cultural resources reported as total losses, some portion of the hull remains in position. Exposure to currents, tides, and sediment movements in high-energy beach and nearshore waters greatly reduce the potential of preservation, however. In addition, vessels located in shallow waters are more susceptible to commercial salvage and modern-day souvenir hunters. Submerged remains found in deep water are in a more stable environment and are in a better state of preservation. Vessels and aircraft built of metal construction have a greater potential for preservation than wood or composite (metal and wood) resources (McClelland Engineers, Inc. 1985).

Caution must be applied when reviewing casualty reports. When reporting vessel and aircraft casualties, the most prominent land area, island, harbor, or port is given as the location of the loss. This practice continues to this day. In many cases, the actual location of the loss site may be many miles from the geographic location given. Several vessels have been reported lost off Point Arguello and Point Conception, where in reality they were not lost there (Schwemmer and Gamble 2000).

Within certain regions in the Study Area, shipwrecks have concentrated in a relatively small geographic area. Point Pedernales, to the north of Point Arguello, is one such example. This region of the coast is frequently shrouded in fog, which prevented early mariners from spotting the dangers of this rugged shoreline. At Point Pedernales, several ships, representing the various coastal trades, ran aground on the treacherous reefs. The Gold Rush passenger side-wheel steamer *Yankee Blade* was lost in 1854 after striking one of the submerged rocks in fog. Just north of the point, the passenger steamer *Santa Rosa* was lost in 1911, and 20 years later another passenger steamer, the *Harvard*, became stranded. Also victims of fog were nine U.S. naval destroyers that struck the rocks in 1923. Seven warships became total losses: USS *Delphy*, USS *Chauncey*, USS *Young*, USS *Woodbury*, USS *Fuller*, USS *S.P. Lee*, and USS *Nicholas*. Ten years later, the Japanese freighter *Nippon Maru* came to rest on the rocks, a total loss. On the same day that the destroyers were stranded in 1923, the passenger-cargo steamer *Cuba* stranded in fog at Point Bennett, San Miguel Island. Point Bennett is located at the west end of the island and marks the southern boundary of the entrance into the west Santa Barbara Channel, with Point Conception marking the northern boundary. Several vessel casualties have occurred on the outlying reefs of Point Bennett. In the same year the *Cuba* was lost, the four-masted schooner *Watson A. West* stranded. The sealing schooner *Leader* was lost in 1876. The two-masted schooner *G.W. Prescott*, carrying a load of railroad ties, was lost in 1879. In 1905, another lumber carrier, the three-masted schooner *J.M. Colman*, was lost. During the filming of "Mutiny On The Bounty" in 1935, the movie barge *W.T. Co. No. 3* foundered off the point. In more recent years, the 1957 transpacific yacht race winner *Legend* became stranded in 1967. Near Point Bennett lie the remains of still more vessels, including the three-masted schooner *Comet*, lost in 1911. Two larger steamers, the tanker *Pectan* (1914) and cargo carrier *Anubis* (1908), stranded near Point Bennett, but they were ultimately re-floated (Morris and Lima 1996). As late as 1997, the commercial fishing vessel *Lady Christine* stranded near the point and was re-floated several months later.

2.4 HISTORICAL/CULTURAL RESOURCES IN THE STUDY AREA

2.4.1 Submerged Historical/Cultural Resource Sites

2.4.1.1 Theories Explaining the Presence of Historical/Cultural Material Underwater

Hudson and Howorth (1985) reviewed ten different possible explanations for the presence of submerged historical/cultural resources:

- Ceremonial deposition;
- Anchors (fishing stations);
- Eustatic changes;
- Cliff erosion;
- Material washed out to sea from coastal streams;
- Earthmoving activities;

- Random loss;
- Cairns;
- Ballast; and
- Coastal subsistence.

Hudson concluded that the first four of these theories were feasible for this region and added "unknown" as a fifth category. He did acknowledge that some of the other theories could be applicable in certain circumstances. For example, intertidal archaeological finds in the vicinity of the Santa Barbara Harbor ceased after the harbor was built and the area became covered with sand as a result of the altered coastline. He also acknowledged that material could have been randomly lost, jettisoned, or sunk from watercraft, including cargoes as well as ballast. This theory was included in a later study (Howorth and Hudson 1993).

Regarding ceremonial deposition, Hudson believed that "supervessels," huge stone vessels up to a meter or more in height, may have been deliberately dropped into the sea. Two such vessels were reported off Anacapa Island, one off Santa Cruz and another off San Miguel. In addition, a concentration of small vessels was found in at least one site off Santa Rosa Island (Howorth and Hudson 1993). Finally, aggregates of stone vessels have been found in at least five sites immediately east of Point Conception, which is sacred to the Chumash (Hudson 1976; Hudson and Howorth 1993). A charmstone was also found in the same area (Hudson 1979; Hudson and Howorth 1985). Six grooved stones, probably representing net anchors, have been found at two mainland coast sites east of Point Conception (Hudson 1976; Hudson and Howorth 1985).

Eustatic changes may account for artifacts found in deeper water representing earlier periods. At the end of the last ice age some 18,000 years ago, huge volumes of water were released as the ice melted, literally raising global sea levels. This process continued until 2,000 to 3,000 years ago (Howorth and Hudson 1993; Hudson 1976; Hudson and Howorth 1985). Coastal village sites representing earlier periods were likely submerged as sea levels rose. Projections of ancient coastlines, established by radiocarbon-dating marine organisms, have been made for the Holocene (12,000 years B.P. to the present). Artifacts found along what is believed to be ancient shorelines were compared to those in dated terrestrial archaeological sites. Hudson concluded that nine sites along the mainland coast and four sites at the islands represented submerged village sites (Hudson 1976; Hudson and Howorth 1985).

As mentioned earlier, erosion of coastal bluffs, both at the Channel Islands and along the mainland coast, undoubtedly results in archaeological material falling into the sea. At least three sites along the mainland coast and two at Santa Cruz Island were the result of erosion (Howorth and Hudson 1993; Hudson 1976; Hudson and Howorth 1985). Such sites are probably grossly under-reported.

2.4.1.2 Distribution of Submerged Historical/Cultural Resource Sites

A total of 18 submerged historical/cultural resource sites exists off the four northern Channel Islands: three off Anacapa; seven off Santa Cruz; three off Santa Rosa; and five off San Miguel (Howorth and Hudson 1993). A number of Chumash artifacts have been recovered from these sites, while others have been reported and left in place. Again, the number of marine archaeological sites caused by erosion is likely to be grossly under-reported, particularly at the Channel Islands, where few people walk the beaches at low tide.

Along the mainland coast of the Study Area, 35 sites exist (Hudson and Howorth 1985). Again, it is likely that marine archaeological sites caused by erosion are under-reported, especially in areas characterized by cliff retreat from erosion. Numerous middens on top of coastal bluffs can be found west of Santa Barbara to the northern limit of the Study Area.

Detailed discussions of both Channel Islands and mainland sites can be found in three documents (Howorth and Hudson 1993; Hudson 1976; Hudson and Howorth 1985). Submerged Historical/Cultural Resource Sites

2.4.2 Shipping History

Submerged historical resources in the Study Area date back to Spanish occupation (1769–1821), through the Mexican period (1822–1846) and into this century. Explorer Juan Rodriguez Cabrillo in 1542 to 1543 made the earliest recorded exploration of this region. Vessel losses for the period have not been documented and are left to speculation by historians, who believe Cabrillo's ship *Victoria* may have grounded briefly at one of the islands. Manila galleons sailed through the area on their southern voyage from northern California to Mexico between 1565 and 1815. During this period at least 10 galleons were lost, their locations still unknown, with the possible exception of the *San Augustin* lost in 1595 in Drakes Bay near San Francisco. It was rumored a galleon was lost off Point Bennett, San Miguel Island, but this has not been substantiated. At the turn of the eighteenth century, ships engaged in the sea otter fur trade hunted at the Channel Islands and mainland coast near Santa Barbara. As the sea otter population became depleted, seals were then hunted for their furs (Morris and Lima 1996). Vessels in the hide and tallow trade frequently called at the Santa Barbara settlement to export the cargo. At least six vessels during the period 1819 to 1846 (pre-American occupation) were reported as lost in the Study Area.

2.4.2.1 Explanation of Vessel Losses

Table C-18 indicates a rise in the rate of casualties reported during the California Gold Rush period (1849 to 1856). This was based on an increase in steam and sailing vessel activity passing through the region and western expansion. Pre-Gold Rush (before 1849) records of casualties are more difficult to locate, therefore the representation of shipwrecks from this earlier period is less accurate.

Table C-18. Total Number of Vessel and Aircraft Casualties Reported Within the Study Area

			Total Loss	Non-Total Loss
1810	-	1819	2	0
1820	-	1829	0	2
1830	-	1839	1	0
1840	-	1849	4	0
1850	-	1859	8	0
1860	-	1869	2	0
1870	-	1879	11	0
1880	-	1889	9	3
1890	-	1899	16	0
1900	-	1909	18	4
1910	-	1919	19	11
1920	-	1929	31	35
1930	-	1939	31	17
1940	-	1949	80	7
1950	-	1959	44	9
1960	-	1969	64	4
1970	-	1979	52	7
1980	-	1989	103	9
1990	-	1999	77	7
2000	-		2	0
Total(s)			**574**	**115**

Notes: Listed by decade from 1810 to 2000. Does not include reported losses where no vessel or aircraft name was available.

The next increase in vessel losses occurred during the 1870s. This was attributed to the increase in commercial fisheries and the transportation of lumber products for building material to southern ports. Lumberyards were established in Santa Barbara, Ventura, and San Pedro during this period (Cox 1974). The expanding railway system also required lumber products that were shipped south from the lumber mills of northern California and the Pacific Northwest. The seagoing lumber trade in the Pacific is one of the most significant and long-lasting maritime economic developments, continuing well into the twentieth century (Gearhart *et al.* 1990). Vessels engaged in island commerce date back to nineteenth century sheep and cattle operations. Today, vessels still travel to the islands, providing public transportation for national park and sanctuary visitors, and employees of island operations.

American military vessels representing the U.S. Coast Survey (renamed the U.S. Coast and Geodetic Survey in 1878) and the Revenue Cutter Service (now the USCG) called at Santa Barbara during the 1850s. In 1849, the three-masted naval auxiliary steam bark *Edith*, en-route to Santa Barbara from Sausalito to transport representatives to the California State Constitutional Convention, was lost at San Antonio Creek, just north of Purisima Point (Schwemmer and Gamble 2000). The *Edith* represents the earliest American steam and naval vessel lost in the western United States and is located in the Study Area. The *Edith* was designed with an Ericsson telescoping propeller shaft; this shipwreck may provide the only surviving artifact of this kind (Nevitt 1941).

During the late nineteenth century, naval vessels frequently called at the ports of San Diego and San Francisco, transiting the nearshore waters between these ports. The protected waters of the Santa Barbara Channel were regularly used for sea trials by military vessels, as in the case of the battleship USS *Oregon* in 1896 (Tompkins 1966). From World War II to present, military aircraft from local bases on the mainland and offshore islands have been flown over the channel for training operations. Both military and civilian aircraft have been lost in the Study Area, including the recent Alaska Airlines crash in early

2000. Military vessel operations still continue in the Santa Barbara Channel, south of the Channel Islands and to the north of Point Conception. This region is currently part of the Naval Air Warfare Center Weapons Division, Point Mugu Sea Range (U.S. Navy 1999). The most recent shipwreck associated with these military operations was the stranding of the USS *Hostile Method 9* in 1999 at Government Point, just south of Point Conception.

In modern times, even with the advent of electronic navigational systems, there has been an increase in the number of casualties, mostly due to errors in judgment, uncharted hazards and unseaworthy vessels. These high numbers are also associated with an increase in recreational vessel use and a heightened awareness of reporting vessel losses by the USCG (Schwemmer and Gamble 2000). Although modern casualties do not represent historic resources, unless the vessel or aircraft was built over 50 years ago or had a unique design, each wreck still reflects the maritime historical landscape of this Study Area. Also, over time such wrecks could become of historic interest. Vessels lost in recent years may represent one-of-a-kind design features unique to this region, not unlike earlier island vessels designed and built for oceangoing cattle transportation. Military surplus vessels from the World War II era are still engaged in commercial coastal work and represent design features unique to a period more than 50 years ago.

2.4.2.2 Distribution of Submerged Historical Resource Sites

The number of shipwrecks and aircraft in the Study Area represents diverse historic resources (Table C-19). These craft were engaged in coastal, military, and in some cases, international trade. Shipwrecks can reflect transitions in construction methods and ship architecture, ranging, for example, from small wooden sloops to steel-hulled, fully rigged sailing vessels. The wooden-hull passenger steamer *Winfield Scott*, built in 1850, and the steel-hulled *Cuba*, built in 1897, are good examples of the evolution of steam propulsion and advancements in hull design over just a 47-year period. The *Winfield Scott* was powered by two side-lever steam engines driving two paddle wheels, whereas the *Cuba* was powered by two triple-expansion engines driving two propellers. Both vessels were engaged in the passenger and cargo trade between Panama and San Francisco and both were owned by the Pacific Mail Steamship Company at the time of their loss (Schwemmer 2000b).

Table C-19. Historic Vessels in the CINMS

Name	***Aggi***	***Comet***	***Cuba***	***Goldenhorn***
Type	Steel full-rigged sail	Wooden schooner	Steel propeller	Iron bark sail
Built	1894	1886	1897	1883
Lost	1915	1911	1923	1892
Historic Theme	International grain trade	Lumber carrier	Cargo-passenger	Bulk cargo carrier
Gross Tonnage	1,898	429	3,168	1,914
Length*	265	144.6	308	268.6
Breadth*	39.1	35.2	42	40.2
Depth of Hold*	23.1	11.4	24.7	23.7

*Dimensions in feet.

Artifacts located at submerged shipwreck sites, such as personal items or tools, provide valuable information about the crew and passengers who once sailed aboard these vessels. Further, shipwrecks can provide insight into the regional commerce of not only the Study Area, but sometimes, international trade (Terrell 1995). Documented submerged shipwrecks and aircraft can be pinpointed to a given day, providing optimal time capsules for archaeologists and historians to study. Submerged land use sites, such as landings, piers, and wharves, can provide historians with valuable information on the broader context of regional, national, and international commerce.

2.4.2.3 Shipwrecks of Historic Importance

Collectively and individually, certain land use sites, shipwrecks, and aircraft in the Study Area are of national historic significance. To date, however, the only two shipwrecks in the Study Area to be nominated and to receive a listing on the National Register of Historic Places (NRHP) are the California Gold Rush era side-wheel steamers *Winfield Scott* and *Yankee Blade* (Delgado 1992).

For a shipwreck to be eligible for listing, the vessel must be significant in American history, architecture, archaeology, engineering, or culture; and possess integrity of location, design, setting, materials, and workmanship. It may also evoke an aesthetic feeling of the past. The association of the vessel to its setting can also be important. The shipwreck should meet one or more of the four NRHP (2000) criteria:

1. Be associated with events that have made a significant contribution to the broad patterns of our history;

2. Be associated with the lives of persons significant in our past;

3. Embody the distinctive characteristics of a type, period, or method of construction, represent the work of a master, possess high artistic values, or represent a significant and distinguishable entity whose components may lack individual distinction; and

4. Have yielded, or may be likely to yield, information important to prehistory or history.

Grouping shipwrecks into a Maritime District rather than as individual sites is another possibility. Maritime Districts make up a geographically definable area possessing a significant concentration, linkage, or continuity of maritime sites, buildings, structures, or objects united by past events or by plan or physical development (Delgado 1992).

The shipwrecks in the Sanctuary (Table C-19) may meet the criteria for listing on the NRHP.

The following accounts briefly describe the history of each ship and its historic importance:

Aggi: Mackie and Thomson built the three-masted full-rigged ship *Aggi* in 1894 at Glasgow, Scotland. This steel-hulled vessel was originally christened *Seerose*, which was later changed to *Sant' Erasmo*, then renamed *Apise*. At the time of loss, *Aggi* was owned by the Norwegian firm of B.A. Olsen and Son.

With a cargo of barley and beans, the *Aggi* departed San Francisco on April 29, 1915, under tow by the steamer *Edgar H. Vance*. En route for the Panama Canal to later sail on to Malmo, Sweden, the two vessels encountered a severe storm, which caused the towing hawser to part. The steamer limped back to San Francisco, leaving the *Aggi* on its own. The cargo shifted, putting the lee rails under water and submerging half the bunks in the forecastle. Although an effort was made to reach Santa Barbara, the vessel was unmanageable and struck Talcott Shoal, Santa Rosa Island. The remains of the *Aggi* lie at the top of the shoal and are scattered into deeper water.

National Register Consideration: The shipwreck site of the *Aggi* represents European advancements in the introduction of steel constructed sailing vessels over iron or wood, in the late nineteenth century. *Aggi*'s final career represents this nation's international grain trade after the opening of the Panama Canal.

Comet: The three-masted lumber schooner *Comet* was built in 1886 at the Hall Brothers' shipbuilding firm at Port Blakely, Washington. It was built of Douglas fir with the exception of its hardwood stem- and sternposts, and had an elliptic stern and billet head. It was equipped with a centerboard and had one

deck. Like many of its contemporaries, it was fitted with bow and stern ports for loading lumber. During the *Comet*'s 25-year career, it delivered lumber to many coastal ports along the west coast (Russell 1996).

The *Comet* departed Aberdeen, Washington, destined for San Pedro, with its holds full and decks covered with a cargo of 500,000 board feet of lumber. On August 30, 1911, at 8:00 p.m., while sailing in heavy seas with a thick fog, the *Comet* struck Wilson Rock, 2.5 miles northwest of Harris Point, San Miguel Island. After the vessel struck the rock, it drifted with the current toward San Miguel Island. The crew lowered the sails to ease the strain, then grounded the schooner in Simonton Cove.

Today, the complete bow section of the *Comet* lies partly buried in the sand along the high tide line. The bow section is in a remarkable state of preservation and is possibly the only example of a Hall Brothers-built vessel (Schwemmer 2000a).

National Register Consideration: The *Comet*'s hull design is unique to nineteenth-century Pacific Coast-built lumber schooners, with heavily-fastened, over-built construction of Douglas fur timbering, lumber loading ports, a beamy, shallow hull, and fore-and-aft rigging. The three-masted lumber schooner *C.A. Thayer* was also employed in the Pacific lumber trade and is now a floating historic vessel moored at the National Maritime Museum in San Francisco. Both the *Comet* and *C.A. Thayer* have similar design features, with the *Thayer* representing construction features of shipwright Hans Bendixsen at Fairhaven, California.

Cuba: The German-designed and built steamer *Cuba* was launched as the *Coblenz* at the Hamburg shipyard of Blohm and Voss on March 18, 1897. Blohm and Voss, which survived two world wars and is still in existence today, is recognized for building vessels such as the German battleship *Bismarck* and the sailing vessel *Horst Wessel*, now known as the USCG training ship *Eagle*. *Coblenz* was originally built for the Norddeutscher Lloyd of Bremen as an oceangoing passenger steamer and served this line until seized as a World War I prize in the Philippines. It was admitted to American registry under a joint resolution of Congress on May 12, 1917 and given the name *Sachem*. Pacific Mail Steamship Company purchased the *Sachem* and later changed its name to *Cuba*. Ultimately, the steamer was put on the Panama - San Francisco route. *Cuba*'s power plant consisted of two triple-expansion steam engines, which delivered the relatively high revolutions required to drive the twin propellers (Schwemmer 2000b).

In the early morning darkness of September 8, 1923, the *Cuba* was northbound en route from the Panama Canal to San Francisco. In thick fog for 3 days, the ship navigated blindly up the coast, which led to its stranding on the treacherous reefs of Point Bennett, San Miguel Island. There was no loss of life. The passengers boarded lifeboats and were picked up by passing ships.

The shipwreck site offers an opportunity to study late nineteenth-century ship construction and propulsion design. The triple-expansion steam engines sit upright 14 feet off the sea floor, with the Scott boilers still positioned in front of the engines. The *Cuba* is the most compact and organized of all the major shipwrecks in the sanctuary, with much of its deck equipment in place (Morris and Lima 1996).

National Register Consideration: The shipwreck site of the *Cuba* represents vessels seized in World War I and put into American passenger and cargo service. The *Cuba*'s builder, Blohm and Voss, is still internationally recognized for its achievements in the development of vessels, submarines, and aircraft.

Goldenhorn: The four-masted bark *Goldenhorn* was built for J.R. de Wolf and Son by Russell and Company of Greenock, Scotland, in 1883. The iron-hulled vessel was originally ship-rigged.

On the evening of September 12, 1892, the *Goldenhorn* was en route from Newcastle, New South Wales, Australia, to San Pedro, California, with coal destined for the Southern Pacific Railroad Company.

Encountering thick fog off Santa Rosa Island, the bark was becalmed and driven ashore by a strong current and swell at 8:00 in the evening (Schwemmer 1999). The shipwreck scatter of the *Goldenhorn* lies off the southwest coast of Santa Rosa Island. Mapping of this site was started in 1985, and three separate scatters of wreckage were identified, including an 83-foot section of bottom hull (Morris and Lima 1996).

National Register Consideration: The shipwreck site of the *Goldenhorn* represents the European coal trade during America's railroad expansion in the late nineteenth century. Artifacts associated with the shipwreck *Goldenhorn* were used in the establishment of fishing camps during Chinese occupation of Santa Rosa Island.

Within the Study Area but outside Sanctuary boundaries lie a number of shipwrecks of historic significance (Table C-20). Several of these qualify for consideration on the NRHP. Collectively, shipwrecks in the vicinity of Point Pedernales could be included in a Maritime District.

Table C-20. Historic Vessels in the Study Area but Outside the Sanctuary

Name	*Edith*	*Gosford*	*USS McCulloch*
Type	Wooden aux. steamer	Wooden bark	Composite aux. steamer
Built	1844	1892	1897
Lost	1849	1893	1917
Historic Theme	Naval aux. steamer	Cargo: collier	Naval aux. steamer
Gross Tonnage	407	2,251	869
Length*	121	281.6	210
Breadth*	26.3	42.3	33.4
Depth of hold*	14	24.4	17.1

*Dimensions in feet.

The following accounts briefly describe the history of each ship and its historic importance:

Edith: The three-masted auxiliary steamer bark *Edith* was built in 1844 by Samuel Hall, of East Boston, Massachusetts, for Robert Bennett Forbes. To augment its sail propulsion, it was powered by a John Ericsson-designed, Delamater Iron Works steam engine with a single propeller and shaft. The shaft penetrated the hull at one side of the sternpost. The propeller was carried on a pivoted bracket that could be swung sideways and upward to lift the propeller out of the water. It was built for the opium trade, which was legal then, but lay idle in China because the British underwriters refused to insure it, fearing that the heat from its furnaces would damage the opium. Consequently, the machinery was dismantled and the *Edith* sailed back to America, where the equipment was put back into working order. The *Edith* was purchased by the War Department and was engaged in transporting General Winfield Scott and his troops to the Mexican War (Nevitt 1941).

On March 3, 1849, under Congressional legislation, the *Edith* was transferred to the Department of the Navy and turned over to Commodore Thomas Catesby Jones, Commander-in-Chief of the Pacific Squadron at San Francisco. Lieutenant James McCormick was ordered on 16 June to report on the condition of the steamer. Subsequently, he was placed in command, with orders to transport representatives to the California State Constitutional Convention. En route from Sausalito to Santa Barbara, the *Edith* encountered dense fog on August 23, 1849, grounding south of Point Sal (U.S. Navy 1977).

National Register Future Consideration: Although the site of the *Edith* has not been located, contemporary research provides good documentation on its probable location. The site of the *Edith*

would represent the oldest-known steamer and naval vessel to be lost on the west coast of America and may represent the only known Ericsson-designed telescoping propeller shaft.

Gosford: The shipyard of Scott & Company at Greenock, Scotland, built the four-masted, steel-hulled bark *Gosford* in 1892.

In November 1893, *Gosford* was en route from Birkenhead, England, to San Francisco with a cargo of coal. When it was about 300 miles off the California coast, its cargo erupted in fire, an event not uncommon with coal. According to Lloyd's Survey Handbook (1956), all classes of coal are liable to spontaneous combustion and therefore require adequate ventilation of holds. The crew made attempts to extinguish the fire without success as the *Gosford* neared Point Conception. The steam-schooner *Caspar* arrived on the scene and offered to take the bark in tow. Captain William Chatman accepted. The *Gosford* was towed to Cojo Anchorage, just southeast of Point Conception. On November 22, 1893, even with other vessels arriving on the scene to render assistance, the *Gosford* succumbed to the fire and foundered at Cojo. Portions of the steel hull and some of its cargo of coal still exist at the site (Schwemmer and Gamble 2000).

National Register Consideration: The shipwreck site of the *Gosford* represents sailing vessels engaged as colliers in the international coal trade during the American industrial revolution.

USS McCulloch: This ship was built in 1897 by William Cramp and Sons of Philadelphia for the Revenue Cutter Service (now the USCG). It was ranked as a first-rate vessel in the Revenue Service in 1898. Its assigned status was "cooperating with Navy" (Revenue Cutter Service 1898). The *McCulloch* was originally rigged as a two-masted barkentine driven by a triple-expansion steam engine. Its composite steel hull was planked with wood. It was the largest revenue cutter of its time (Canney 1995).

The *McCulloch* was on its shakedown cruise at Malta when word was received that the *Maine* had been sunk in Havana Harbor, Cuba. The *McCulloch* was ordered to join Commodore Dewey's Asiatic Squadron, then at Hong Kong. Its white hull was painted gray and additional guns were added. The *McCulloch* arrived at Manila Bay with other ships and silenced a Spanish shore battery. Commodore George Dewey had won a decisive victory, with no losses. As the *McCulloch* sailed for Hong Kong, news was received that the Spanish fleet had been destroyed (Gurney 1973). Transferred to the Navy on April 6, 1917, the *McCulloch* was assigned to patrol operations along the Pacific Coast (U.S. Navy 1969).

On June 13, 1917, the passenger steamer *Governor* was moving forward at a cautious speed through dense fog when its lookout discovered the approaching USS *McCulloch*. The *Governor*'s alarm was sounded just before the two vessels collided off Point Conception. The *Governor* struck the starboard bow of the *McCulloch*, making a large hole, which caused water to pour in so fast that the vessel sank in 35 minutes. The *Governor* took aboard the Navy crew of 110, including one sailor with serious injuries (*Los Angeles Times* 1917).

National Register Future Consideration: Remote sensing surveys of this region have identified the probable submerged site of the USS *McCulloch* (Hunter 1999). *McCulloch*'s naval career played a significant role in American history as part of Commodore George Dewey's Asiatic Squadron.

3.0 APPENDIX C - REFERENCES

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APPENDIX D

PROPOSED DETERMINATIONS AND FINDINGS

INTRODUCTION

Under the NMSA the Secretary of Commerce may designate an area as a national marine sanctuary and promulgate regulations implementing the designation if the Secretary makes a set of determinations and findings and has considered factors and conducted consultations described in the NMSA (16 U.S.C. 1433(a) and (b)). Although CINMS was designated in 1980, the NMSA states that terms of designation may be modified only by the same procedures by which the original designation was made. Because this action proposes to revise the CINMS terms of designation somewhat (see summary below), relevant determinations and findings based on required factors and consultations are described here. In addition, NEPA requires that the NMSP explain how the proposed actions and regulations described in this document relate to existing law and executive orders. This Appendix meets these NMSA and NEPA requirements by describing below the consultations in section I, making proposed determinations and findings and considering factors in section II, and discussing the relation of the proposed action to existing laws and executive orders in section III.

SUMMARY OF PROPOSED CHANGES TO THE SANCTUARY'S TERMS OF DESIGNATION

Since the NMSP is currently proposing several revisions to the CINMS terms of designation, the NMSP has provided the required determinations and findings from the NMSA after the following summary of the proposed revisions. Proposed revisions of the Description of the Area would: clarify that the submerged lands at CINMS are legally part of the Sanctuary and are included in the boundary description, replace the term "seabed" with "submerged lands of the Sanctuary", and clarify that the Mean High Water Line marks the Sanctuary's shoreline boundary. Proposed changes to the Scope of Regulations would authorize Sanctuary regulation of: exploring for, developing, or producing minerals within the Sanctuary; discharging or depositing from beyond the boundary of the Sanctuary any material or other matter that subsequently enters the Sanctuary and injures a Sanctuary resource or quality; placing or abandoning any structure, material, or other matter on or in the submerged lands of the Sanctuary; moving, injuring, possessing, or attempting to move, injure, or possess a Sanctuary historical resource; taking any marine mammal, sea turtle, or seabird within or above the Sanctuary; possessing within the Sanctuary any marine mammal, sea turtle, or seabird; marking, defacing, damaging, moving, removing, or tampering with any sign, notice, or placard, whether temporary or permanent, or any monument, stake, post, or other boundary marker related to the Sanctuary; and introducing or otherwise releasing from within or into the Sanctuary an introduced species. Additional proposed changes to the terms of designation would provide: an updated and more complete description of characteristics that give the Sanctuary particular value; greater clarity on the applicability of Sanctuary emergency regulations (and in keeping with the NMSP regulations of general applicability, 15 CFR part 922, Subpart E); revision of the Scope of Regulations section on consistency with international law with language taken directly from sec. 305(a) of the NMSA, which deals with application of regulations; an updated explanation of the effect of Sanctuary authority on preexisting leases, permits, licenses, and rights; and occasional wording fine-tuning in order to conform wording of the terms of designation, where appropriate, to wording used for more recently designated sanctuaries. No changes are proposed to be made to the "Fishing" and "Defense Activities" sections within Article V (Relation to Other Regulatory Programs) of the terms of designation as part of this action.

SECTION I: CONSULTATIONS AND RESULTS UNDER THE NMSA

Under section 303(b)(2) of the NMSA, the NMSP is required to conduct a series of consultations with Congress, federal and state agencies, and other interested parties. Per this requirement, consultation letters were sent in May 2003 to the following:

- Department of Defense;
- Department of Energy;
- Department of the Interior;
- Department of State;
- Department of Transportation;
- Environmental Protection Agency;
- National Marine Fisheries Service (NMFS);
- Pacific Fishery Management Council;
- Governor, State of California;
- California Resources Agency;
- California Department of Fish and Game;
- California Department of Water Resources;
- California Resources Agency;
- California State Lands Commission;
- California Fish and Game Commission;
- California Department of Boating and Waterways;
- California Department of Conservation;
- California Coastal Commission;
- City of Santa Barbara;
- County of Ventura;
- County of Santa Barbara;
- House of Representatives Resources Committee;
- Senate Committee on Commerce, Science, and Transportation;
- Members of California's Congressional Delegation;
- Sanctuary Advisory Council, CINMS.

The comments received in response to the consultation letters were considered in the preparation of this FMP/FEIS. The results of these consultations were also used to assist in making the determinations and findings described in section II.

An additional set of consultations is also required by the NMSA and other laws, and was conducted after NOAA released the DMP/DEIS for public review in May 2006. These additional consultations included:

- Section 7 Endangered Species Act consultation with NMFS and the U.S. Fish and Wildlife Service (required by the Endangered Species Act) – NMFS found that the proposed regulatory changes will benefit species listed under the ESA, and concurred with the determination that the action is not likely to adversely affect endangered or threatened species under NMFS' jurisdiction. The U.S. Fish and Wildlife Service also concurred with the determination that the action is not likely to adversely affect endangered or threatened species under the U.S. Fish and Wildlife Service's jurisdiction that occur in the CINMS. The U.S. Fish and Wildlife Service also

found that the only impact on listed species as a result of the DMP/DEIS, if adopted, is expected to be beneficial in the form of increased protections for listed species.

- Essential Fish Habitat consultation with NMFS (required by the Magnuson-Stevens Act) – NMFS determined that the proposed regulatory action alternatives would not adversely affect EFH, and that many have the potential to enhance EFH.

- Federal consistency consultation (determination) with the State's coastal zone management agency (required by the Coastal Zone Management Act) –NOAA initiated this consultation with the California Coastal Commission in 2006. NOAA will conclude this consultation following release of this FEIS.

- National Historic Preservation Act sec. 106 consultation – NOAA sent a consultation letter to the California State Historic Preservation Officer in May, 2006. The State Historic Preservation Officer did not submit comments on the proposal.

SECTION II: NMSA AND NEPA FINDINGS AND DETERMINATIONS

A. Determinations Required Under Section 303 of the NMSA

1. *The designation will fulfill the purposes and policies of the NMSA.*

2. *The area is of special national significance due to–*

   a) *its conservation, recreational, ecological, historical, scientific, cultural, archaeological, educational, or esthetic qualities;*
   b) *the communities of living marine resources it harbors; or*
   c) *its resource or human-use values.*

These determinations and findings were made when the Sanctuary was designated in 1980. The proposed addition of submerged lands to the description of the Sanctuary boundary and the other proposed changes to the terms of designation described in this FMP/FEIS are consistent with and further support the original determinations and findings. The waters and submerged lands of the Sanctuary, and their associated marine life and historical/cultural resources, possess exceptional value in all categories (conservation, recreational, ecological, historical, scientific, cultural, archaeological, educational, and esthetic qualities). The proposed changes would provide additional protection to bottom habitats, water quality, living resources, and historical/cultural resources of the Sanctuary.

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

4. *Designation of the area as a national marine sanctuary will facilitate the objectives stated in paragraph 3.*

The original FEIS found that existing statutes did not provide a comprehensive management mechanism for marine waters surrounding the northern Channel Islands. The proposed changes to the terms of designation would allow existing laws relating to marine resource management, water quality protection, and marine species protection within the Sanctuary to be supplemented. The proposed changes would also allow for more comprehensive and coordinated management, including scientific research and public education, of living and non-living resources in the Sanctuary.

5. *The area is of size and nature that will permit the comprehensive and coordinated conservation and management.*

Although proposed changes to the terms of designation would clarify that submerged lands are included as part of Sanctuary's described boundary, and that the Mean High Water Line marks the Sanctuary's shoreline boundary, there would be no change to the Sanctuary's overall size.

B. Determinations Required Under Section 303(b)(1) of the NMSA

Section 303(b)(1) of the NMSA (16 U.S.C. 1433(b)(1)) requires that the following factors be considered for purposes of determining if an area of the marine environment meets the standards set forth in section 303(a). Each factor is discussed below:

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

2. *The area's historical, cultural, archaeological, or paleontological significance.*

The exceptional natural resource and ecological qualities of the Channel Islands National Marine Sanctuary are described in the original FEIS on pages 11-55, and an updated description is provided in this document at section 3.0. The proposed changes to the activities that could be regulated (published at 71 FR 29096 and 73 FR 16580), and analyzed in this FEIS, recognize the significance of maintaining the Sanctuary's water quality, protecting sensitive species and habitats, and protecting historical/cultural resources of the Sanctuary.

3. *The present and potential uses of the area that depend on maintenance of the area's resources, including commercial and recreational fishing, subsistence uses, other commercial and recreational activities, and research and education.*

4. *The present and potential activities that may adversely affect the factors identified in subparagraphs 1, 2, and 3.*

A description of the human uses of the Sanctuary and its surrounding areas is provided in the original FEIS on pages 59-90, and an updated description is provided in this document at section 3.0. The proposed changes to the terms of designation would allow for increased protection of the resources that support commercial and recreational fishing, diving, boating, research, and education.

5. *The existing State and Federal regulatory and management authorities applicable to the area and the adequacy of those authorities to fulfill the purposes of the NMSA.*

Management authorities and associated laws and regulations applicable to the Sanctuary are described in the original FEIS on pages F6-49, and an updated description is found in section 5.0 of this document. Existing management authorities were considered in the final rule designating the Sanctuary in 1980 (45 FR 65198) and the additional protections and comprehensive management approach provided by the Sanctuary management plan and regulations continue to apply.

6. *The manageability of the area, including such factors as its size, its ability to be identified as a discrete ecological unit with definable boundaries, its accessibility, and its suitability for monitoring and enforcement activities.*

The proposed changes to the terms of designation would clarify that submerged lands are part of the Sanctuary's underlying boundary, as well as clarify that the Mean High Water Line marks the Sanctuary's shoreline boundary, but would not change the overall size, manageability, accessibility or suitability for monitoring and enforcement activities in the Sanctuary.

7. *The public benefits to be derived from sanctuary status, with emphasis on the benefits of long-term protection of nationally significant resources, vital habitats, and resources which generate tourism.*

The public benefits from sanctuary status were described in the original 1980 FEIS and final rule designating the Sanctuary (45 FR 65198). The changes to the terms of designation analyzed in this FMP/FEIS would enhance public benefits by providing for increased protection to water quality, seabed habitats and marine life, sensitive marine species, and cultural and historical resources of the Sanctuary while still allowing for continued public use and enjoyment, education, and research of the Sanctuary environment.

8. *The negative impacts produced by management restrictions on income-generating activities such as living and nonliving resources development.*

9. *The socioeconomic effects of sanctuary designation.*

An analysis of the socioeconomic impacts of proposed regulatory changes is included in section 4.0 of this FEIS. The socioeconomic analysis concludes that impacts of the proposed changes would be less than significant.

10. *The area's scientific value and value for monitoring the resources and natural processes that occur there.*

The area's scientific value and value for monitoring the resources and natural processes are described in the original FEIS, management plan, and final rule for designation of the Sanctuary. The changes to the terms of designation analyzed in this FMP/FEIS will enhance the area's scientific and monitoring value by allowing for increased protection to seabed habitats and features, water quality, and living resources of the Sanctuary.

11. *The feasibility, where appropriate, of employing innovative management approaches to protect sanctuary resources or to manage compatible uses.*

The changes to the terms of designation, along with other regulatory and management changes proposed at 71 FR 29096 and 73 FR 16580, and analyzed in this FMP/FEIS, represent an appropriate mechanism to manage and protect Sanctuary resources, and propose many innovative management approaches to education, research, and resource protection.

12. *The value of the area as an addition to the System.*

The Sanctuary has already been a part of the Sanctuary System since 1980.

C. Resource Assessment

1. *Present and potential uses of the area, including commercial and recreational fishing, research and education, minerals and energy development, subsistence uses, and other commercial, governmental, or recreational uses.*

Section 3.0 of this FEIS (Affected Environment) provides a full description of the current and potential uses of the area.

2. *Any commercial, governmental, or recreational resource uses in the areas that are subject to the primary jurisdiction of the Department of the Interior.*

The Department of the Interior has been contacted. Coordination and consultation with the National Park Service has occurred and will continue with regard to management and public use of the Channel Islands National Park. Additionally, consultation has occurred and will continue with the U.S. Fish and Wildlife Service and the Minerals Management Service.

3. *Information prepared in consultation with the Secretary of Defense, the Secretary of Energy, and the Administrator of the Environmental Protection Agency, on any past, present, or proposed future disposal or discharge of materials in the vicinity of the proposed sanctuary.*

As noted above, these three agencies were consulted. The NMSP is not aware of any actively used past, present, or future disposal or discharge areas designated or to be designated within the Sanctuary by these agencies.

SECTION III: RELATION TO EXISTING LAWS AND EXECUTIVE ORDERS

NEPA requires that a discussion of the relation of the proposed action to other existing laws and executive orders be included. The relation of this proposed action to other legal requirements is discussed as follows:

Coastal Zone Management Act (CZMA)

The CZMA creates a partnership between the Federal and State governments that allows States to develop coastal zone management programs within a set of Federal requirements but tailored to their individual needs. The CZMA also requires that each Federal agency activity within or outside the coastal zone that affects any land or water use or natural resource of the coastal zone shall be carried out in a manner that is, to the maximum extent practicable, consistent with the enforceable policies of the Federally-approved state coastal zone management program.

Located partially within State waters, the Sanctuary works closely with several California state departments and commissions. NOAA has consulted with the California Coastal Commission on the federal consistency of the proposed action with the California Coastal Zone Management Program. NOAA initiated this consultation with the Commission in 2006. NOAA will conclude this consultation following release of this FEIS.

Magnuson-Steven Fishery Conservation and Management Act (MSFCMA)

The MSFCMA governs the management and conservation of fisheries in Federal waters of the United States and created the Pacific Fishery Management Council (PFMC), along with seven other regional

councils. Sanctuary staff work closely with the PFMC and NOAA Fisheries on matters pertaining to federally managed fisheries within the Sanctuary.

The MSFCMA also requires Federal agencies to consult with NMFS regarding any agency action they authorize (*e.g.*, issue permits for), fund, or undertake, that may adversely affect essential fish habitat (EFH). The NMSP consulted with NMFS on the impact of the proposed action on EFH. NMFS determined that the proposed regulatory action alternatives would not adversely affect EFH, and that many have the potential to enhance EFH.

National Historic Preservation Act (NHPA)

The NHPA was enacted to help protect and preserve the historic heritage of the United States. Section 106 of the NHPA requires that Federal agencies take into account the effects of their activities and programs on historic properties (which are defined as any district, site, building, structure, or object included in or eligible for inclusion in the National Register of Historic Places) by providing the Advisory Council on Historic Preservation with the opportunity to comment on proposed actions. The NMSP consulted with the Advisory Council on Historic Preservation on the impact of the proposed action on any historical or cultural resource in the Sanctuary. NOAA sent a consultation letter to the California State Historic Preservation Officer in May, 2006, indicating that the proposed action includes a Maritime Heritage Resources Action Plan, and a modification of the Sanctuary's historical resources protection regulation. The letter explained the following. The Maritime Heritage Resources Action Plan promotes the responsible exploration for, consistent monitoring of, and increased public understanding and stewardship of historical resources within the Sanctuary. The modified historical resources protection regulation would slightly enhance protection for historical resources by expanding the range of prohibited actions that result in damage or loss of historic resources. The State Historic Preservation Officer did not submit comments on the proposal.

Regulatory Flexibility Act (RFA)

The Regulatory Flexibility Act requires Federal agencies to consider the effects of their regulatory actions on small businesses and other small entities, and to minimize any undue disproportionate burden. If the regulations will have a significant economic impact on a substantial number of small businesses, then an agency must prepare an initial (IRFA) and final regulatory flexibility analysis (FRFA). The Chief Counsel for Regulation of the Department of Commerce certified to the Chief Counsel for Advocacy of the Small Business Administration that the proposed rule, if adopted, would not have a significant economic impact on a substantial number of small entities. The factual basis for this certification appears in the proposed rule (71 FR 29096) and is not repeated here. There were no comments received on the certification or the economic impacts of this rule. As a result, a final regulatory flexibility analysis was not required and none was prepared.

Executive Order 12866 Cost-Benefit Analysis

Under Executive Order 12866, if a rule is determined to be significant, then a socioeconomic impact study (*i.e.*, assessment of the costs and benefits of the regulatory action) must be conducted. Under 12866 a regulatory action is significant if the rule may:

- Have an annual effect on the economy of $100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities;

- Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;

- Materially alter the budgetary impacts of entitlements, grants, user fees, or loan programs, or the rights and obligations of recipients thereof; or

- Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in this Executive Order.

The NMSP has concluded that the proposed rules (published at 71 FR 29096 and 73 FR 16580) addressed in this FEIS are not significant. The Office of Management and Budget has concurred with this conclusion.

Executive Order 13132 Federalism

Under Executive Order 13132, each agency must consult, to the extent practicable and permitted by law, with State and local officials early in the process of developing proposed regulations. These consultations should seek comment on the compliance costs or preemption, as appropriate to the nature of the rulemaking under development.

When an agency submits a draft final regulation to OMB for review under Executive Order 12866 prior to promulgation of the final regulation, the agency must include a separately identified portion of the preamble to the regulation as a "federalism summary impact statement" that must include:

- A description of the extent of the agency's prior consultation with State and local officials;

- A summary of the nature of their concerns and the agency's position supporting the need to issue the regulation; and

- A statement of the extent to which the concerns of State and local concerns have been met.

NOAA has concluded that this regulatory action does not have federalism implications, as that term is defined in Executive Order 13132, to warrant preparation of a federalism assessment. Through the course of the development of the management plan and proposed regulatory changes NMSP staff consulted with members of the Sanctuary Advisory Council, the California Resources Agency, California Department of Fish and Game, and the California Coastal Commission. In addition, staff from the NMSP's west coast region have consulted with the California Department of Boating and Waterways, California Department of Fish and Game, California State Lands Commission, and California Resources Agency. Also, in 2003, the NMSP consulted in writing with the above mentioned state agencies in addition to: the Office of the Governor of California, the California Department of Parks and Recreation, the California Department of Water Resources, the California Department of Conservation, the California Environmental Protection Agency, the California State Water Resources Control Board, and the California Assembly Committee on Natural Resources.

APPENDIX E

MAILING LIST

The following officials, agencies and organizations will receive the Final Management Plan/Final Environmental Impact Statement. In addition, a CINMS public interest email list of over 1000 individuals will be notified and informed about the documents and how to obtain them. The Final Management Plan/Final Environmental Impact Statement may be obtained by download from https://channelislands.noaa.gov or by mail in either CD or hard copy format by contacting:

Management Plan Coordinator, CINMS
113 Harbor Way, Suite 150, Santa Barbara, California, 93109
or by email at mp.request@noaa.gov
or by fax to (805) 568-1582.

Elected Officials

United States Senate
- The Honorable Barbara Boxer
- The Honorable Diane Feinstein

United States House of Representatives
- The Honorable Lois Capps
- The Honorable Elton Gallegly

United States Senate and House Committees
- Chair, Senate Committee on Commerce, Science, and Transportation
- Vice Chair, Senate Committee on Commerce, Science, and Transportation
- Chair, House Committee on Natural Resources

Federal Agencies and Councils

Department of Energy, Director, Office of Environmental Policy and Guidance

Department of Transportation
- Assistant Secretary for Governmental Affairs
- Maritime Administrator, Federal Maritime Administration
- Associate Administrator, Federal Aviation Administration, Office of Commercial Space Transportation

Federal Aviation Administration, Associate Administrator, Office of Commercial Space Transportation

Department of the Interior
- Director, Office of Environmental Policy and Compliance
- U.S. Fish and Wildlife Service, Regional Director, Pacific Region
- Minerals Management Service, Regional Manager, Pacific OCS Region
- National Park Service, Director, Pacific West Region
- National Park Service, Superintendent, Channel Islands National Park
- Los Padres National Forest

Department of State, Deputy Assistant Secretary for Oceans and Fisheries

Department of Defense
- Assistant Deputy Under Secretary for Defense for Environment
- Deputy Assistant Secretary of the Navy (Environment)
- Deputy Assistant Secretary of the Air Force (Environment, Safety and Occupational Health)

National Aeronautics and Space Administration
- Director, Environmental Management Division
- Director, Ames Research Center

United States Coast Guard
- Commander, 11th Coast Guard District
- Chief, Law Enforcement Division, 11th Coast Guard District
- Living Marine Resources Officer, Law Enforcement Division, 11th Coast Guard District
- Staff Attorney, Environmental Law Branch, Legal Division, Maintenance and Logistics Command Pacific
- Commander, Coast Guard Sector Los Angeles-Long Beach
- Commanding Officer, Coast Guard Station Channel Islands
- Commanding Officer, Marine Safety Detachment Santa Barbara

United States Army Corps of Engineers, District Commander, Los Angeles District

United States Federal Maritime Commission, Secretary

National Oceanic and Atmospheric Administration
- Deputy Assistant Administrator, NOAA National Marine Fisheries Service
- NOAA Fisheries Southwest Region, Regional Administrator
- Assistant Administrator, NOAA National Environmental Satellite, Data, and Information Service
- NOAA Coastal Services Center
- National Environmental Satellite, Data, and Information Service (NESDIS), Polar Operational Satellite Program

Pacific Fishery Management Council
- Executive Director and Chair

United States Environmental Protection Agency
- Director, Office of Federal Activities
- Region 9, Federal Activities Branch, Communities and Ecosystem Division
- Director, Office of Ocean, Wetlands, and Watersheds

Tribal Government

- Tribal Chairman, Santa Ynez Band of Chumash Indians
- Tribal Environmental Manager, Santa Ynez Band of Chumash Indians

State Agencies, Commissions, Committees and Boards

- Governor, State of California

- Secretary of Resources, California Resources Agency
- State Historic Preservation Officer, California State Historical Resources Commission
- Director, California Department of Fish and Game
- Chair and Members, Harbor Safety Committee, Los Angeles/Long Beach Harbor
- Executive Director, California Fish and Game Commission
- Director, California Department of Parks and Recreation
- Director, California Department of Water Resources
- Executive Officer, California State Lands Commission
- Director, California Department of Boating and Waterways
- Chairman, California Boating and Waterways Commission
- Director, California Department of Conservation
- Executive Director, California Coastal Commission
- Secretary, California Environmental Protection Agency
- Chair and Executive Officer, California State Water Resources Control Board
- Beach Erosion Authority for Clean Oceans and Nourishment (BEACON)
- Chair, California State Assembly Committee on Natural Resources
- Program Manager, Wastewater Discharge Program, Division of Water, Alaska Department of Environmental Conservation

Local Government

County Government:

- Santa Barbara County, Board of Supervisors
- Santa Barbara County Water Agency
- Santa Barbara County Planning and Development, Director
- San Luis Obispo County Planning Department
- Ventura County Board of Supervisors
- Ventura County Executive Officer
- Ventura County Harbor Department, Director
- Ventura County Library
- Ventura County Planning Division, Supervisor of Regional Programs

Municipal Entities:

- Goleta Sanitary District
- Mayor, City of Morro Bay
- Montecito Sanitary District
- Morro Bay Harbor, Director
- Port of Hueneme/Oxnard Harbor District, Executive Director
- Port San Luis Harbor District
- Santa Barbara City, Wastewater System Manager
- Santa Barbara City Creeks Division, Parks and Recreation Department
- San Buenaventura City, Economic Development Director
- Santa Barbara, Mayor of
- Santa Barbara Harbor, Harbor Operations Manager
- Santa Barbara Public Library, Reference Department
- Santa Barbara Waterfront Department, Director
- Ventura Port District, General Manager
- Ventura Harbor, Harbor Master

Sanctuary Advisory Council Representatives as of November 2008

Bacon, Capt. David – Wave Walker Charters, Santa Barbara CA
Baird, Brian – California Resources Agency
Black, Dianne – County of Santa Barbara
Boone, Amy – California Resources Agency
Baker, Lauri – Hotel Sales and Marketing, Santa Barbara CA
Carey, Barbara – California Coastal Commission, Ventura CA
Chicote, Jose - Montalvo Elementary School, Ventura CA
Collins, CDR Jason – U.S. Coast Guard
Curtis, Susan – County of Santa Barbara
Dunn, W. Scott - Adventours Outdoor Excursions
Fischel, Peter – National Marine Fisheries Service
Galipeau, Russell – Channel Islands National Park
Greene, Carolyn – Channel Islands Naturalists Corps
Grifman, Phyllis – Sea Grant, University of Southern California
Helms, Greg – The Ocean Conservancy
Hudson, Steve – California Coastal Commission, Ventura CA
Kett, Eric – Sea Zen Marine Consulting (former) and Property Manager, Santa Barbara County, CA
Krieger, Lyn – Ventura County Harbor Department
Krop, Linda – Environmental Defense Center, Santa Barbara CA
Marshall, Jim – Commercial Fisherman, Santa Barbara CA
McCrea, Merit – SeaHawk Sportfishing Charters (former) and UC Santa Barbara
Miller, Marilyn – Ventura County Harbor Department
Moe, Andrea – Island Packers, Inc.
Ontiveros, Jacy – Santa Ynez Band of Chumash Indians
Petras, Elizabeth – National Marine Fisheries Service
Petueli, Maria - Ty Warner Sea Center, Santa Barbara CA
Piltz, Fred – Minerals Management Service
Powell, Dan – Oceanographer, Santa Barbara Applied Research
Salazar, Alan – Chumash storyteller, tomol paddler
Schobel, Walter – U.S. Air Force
Schroeder, Donna – Minerals Management Service
Schwartz, Steven – U.S. Navy
Spandrio, Amy - California State University Channel Islands
Spicer, William – Western Gate Publishing
Steele, Bruce – Commercial Urchin Fisherman, Santa Barbara CA
Steward, LTJG Brittany – U.S. Coast Guard
Ugoretz, John – California Department of Fish and Game
Vojkovich, Marija – California Department of Fish and Game
Warner, Robert – University of California, Department of Ecology, Evolution, and Marine Biology

Sanctuary Advisory Council Working Groups (active as of 2008)

Sanctuary Education Team
Conservation Working Group
Chumash Community Working Group
Commercial Fishing Working Group
Recreational Fishing Working Group

Other Private Organizations and Businesses

- Alliance of Communities for Sustainable Fisheries
- American Cetacean Society
- AXYS Environmental Consulting Ltd.
- Beacon Foundation
- Bluewater Network
- Bornholdt, Peron & Pratt, LLP
- Carpinteria Valley Association
- C-PORT
- Cal – PORT
- California Association of Harbor Masters and Port Captains
- California Coastal Protection Network
- California League of Conservation Voters, Headquarters and Santa Barbara
- California Space Authority, Inc.
- Chumash Maritime Association
- Citizens for the Carpinteria Bluffs
- Citizens for Goleta Valley
- Citizens Planning Association
- Citizens Planning Foundation
- Coalition for Sustainable Transportation
- Coastal Resource Information Center, Goleta CA
- Commercial Fishermen of Santa Barbara, Inc.
- Community Environmental Council, Santa Barbara
- Conception Coast Project
- Cruise Lines International Association
- Dave's Marine Fuel Service
- David and Lucile Packard Foundation
- Environmental Center of San Luis Obispo County
- Environmental Defense Center
- Friends of the Elephant Seal
- Friends of the Ellwood Coast
- Joint Oil/Fisheries Liaison Office
- Gaviota Coast Conservancy
- Get Oil Out
- Goleta Valley Land Trust
- Heal the Ocean
- ICF Consulting
- Land Trust for Santa Barbara County
- League for Coastal Protection
- League of Women Voters, Santa Barbara
- Lockheed Martin Space Systems Company
- Lompoc Dive Club
- Lompoc Valley Republican Club
- Los Cerritos Wetlands Task Force
- Los Padres ForestWatch
- Marine Exchange of Southern California
- McKenna Long & Aldridge LLP
- More Mesa Preservation Coalition
- Morro Coast Audubon Society
- National OCS Coalition
- National Wildlife Federation
- Nature Conservancy of California
- Natural Resources Defense Council
- North Coast Alliance, central California
- North West Cruise Ship Association
- Nuevo Energy
- Ocean Futures Society
- Pacific Coast Federation of Fishermen's Association
- Pacific Gas and Electric Company
- Pacific Merchant Shipping Association
- Padre Associates Inc.
- Parrotfish Productions Ltd.
- Project AWARE
- Point Conception Ground Fish Association
- Port San Luis Marine Institute
- Regional Alliance for Information Networking
- San Marcos Foothills Coalition
- San Marcos Trout Club
- Santa Barbara Audubon Society
- Santa Barbara ChannelKeeper
- Santa Barbara County Action Network
- Santa Barbara Museum of Natural History
- Santa Monica Mountain Trails Council
- Save Ellwood Shores
- Seafloor Surveys International, Inc.
- Sea Foam Enterprises
- Shoreline Preservation Fund, Santa Barbara
- Sierra Club, Los Padres Chapter
- Small Wilderness Area Preserves
- Surfrider Foundation, Santa Barbara Chapter

- Surfrider Foundation, Isla Vista Chapter
- Surfrider Foundation, Ventura Chapter
- Surfrider Foundation, San Luis Bay Chapter
- The Ocean Conservancy
- The Otter Project
- Trout Unlimited
- Trust for Public Land
- UCLA Institute of the Environment
- UCSB Environmental Affairs Board
- Urban Creeks Council
- URS Corp.
- USC Wrigley Institute
- Venoco, Inc.
- Ventura County Commercial Fishermen's Association
- Ventura County Economic Development Association
- Ventura County Environmental Coalition
- Vessel Assist
- West Coast Seafood Processors Association
- Western States Petroleum Association
- WET/tv Productions
- Women's Environmental Watch


NOAA