Office of National Marine Sanctuaries
National Oceanic and Atmospheric Administration

Cordell Bank & Gulf of the Farallones National Marine Sanctuaries

Cordell Bank and Gulf of the Farallones National Marine Sanctuaries Expansion

Photos (top row, left to right): Steve Lonhart, Claire Fackler, Jenny Stock, Steve Lonhart; (middle and bottom rows): Jenny Stock

Draft Environmental Impact Statement

April 2014

http://farallones.noaa.gov/manage/expansion_cbgf.html

DRAFT

Environmental Impact Statement

Cordell Bank and Gulf of the Farallones National Marine Sanctuaries Expansion

Prepared by:

Office of National Marine Sanctuaries
National Oceanic and Atmospheric Administration
Cordell Bank & Gulf of the Farallones
National Marine Sanctuaries

April 2014

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
PROGRAM PLANNING AND INTEGRATION
Silver Spring, Maryland 20910

MAR 28 2014

Dear Reviewer:

In accordance with provisions of the National Environmental Policy Act of 1969 (NEPA), the National Oceanic and Atmospheric Administration (NOAA) encloses for your review the Draft Environmental Impact Statement (DEIS) for the Cordell Bank and Gulf of the Farallones national marine sanctuaries. Gulf of the Farallones National Marine Sanctuary (GFNMS), designated in 1981, and Cordell Bank National Marine Sanctuary (CBNMS), designated in 1989, are federally protected marine areas along and offshore of California's north-central coast. The sanctuaries contribute greatly to ocean and coastal management by engaging in public outreach and education to promote stewardship, conducting scientific and applied research initiatives, and developing and supporting programs that strengthen resource protection for the long-term health of the region.

This DEIS is prepared pursuant to NEPA to assess the environmental impacts associated with NOAA developing revised regulations for CBNMS and GFNMS under the National Marine Sanctuaries Act and expanding the sanctuaries. To allow the addition of new areas and the regulation of certain activities not currently identified as subject to regulation, these proposed changes will require NOAA to change the existing terms of designation for CBNMS and GFNMS. The proposed rule published concurrently with this DEIS presents the proposed new regulations and the text of the proposed revised terms of designation for CBNMS and GFNMS.

Public hearings will be held as follows:

(1) May 22, 2014, 6 pm – U.S. Army Corps of Engineers Bay Model Visitor Center, 2100 Bridgeway Blvd., Sausalito, CA 94965.
(2) June 16, 2014, 6 pm – Point Arena City Hall, 451 School St., Point Arena, CA 95468
(3) June 17, 2014, 6 pm – Gualala Community Center, 47950 Center St., Gualala, CA 95445
(4) June 18, 2014, 6 pm – Grange Hall, 1370 Bodega Ave., Bodega Bay, CA 94923

Written comments will be accepted until June 30, 2014, and should be directed to the sanctuary official identified on the second page.

Responsible Official: Holly A. Bamford, Ph.D.
Assistant Administrator for Ocean Services and Coastal Zone Management

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Sanctuary Official: Maria Brown, Superintendent
Gulf of the Farallones National Marine Sanctuary
991 Marine Drive - The Presidio
San Francisco, CA 94129
Ph. (415) 561 6622 x301

Sincerely,

Patricia A. Montanio
NOAA NEPA Coordinator

About This Document

This draft environmental impact statement (DEIS) provides detailed information and analysis of a range of reasonable alternatives for a proposed boundary expansion to include the nutrient-rich waters from the Point Arena ocean upwelling and the waters south of it in these sanctuaries. This document includes analysis of the potential environmental, cultural and socioeconomic impacts of the proposed boundary expansion as well as several regulatory changes that would affect the existing Cordell Bank and Gulf of the Farallones national marine sanctuaries.

The National Oceanic and Atmospheric Administration (NOAA) prepared this DEIS in accordance with the National Environmental Policy Act of 1969 (NEPA; 42 USC §4321 *et seq*.) as implemented by the Council on Environmental Quality regulations (40 CFR Parts 1500-1508), and NOAA Administrative Order (NAO) 216-6, which describes NOAA policies, requirements, and procedures for implementing NEPA.

NOAA is the lead agency for this action. NOAA's Office of National Marine Sanctuaries (ONMS) is the implementing office for this action.

This document relies on expertise and information, comments and recommendations from the sanctuary advisory councils, National Marine Fisheries Service, NOAA staff and scoping participants.

Recommended Citation:

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LIST OF ACRONYMS

AFB	Air Force Base
AIS	Automatic Identification System
APCD	Air Pollution Control District
APPS	Act to Prevent Pollution from Ships
AQMD	Air Quality Management District
ASBS	Areas of Special Biological Significance
BAAQMD	Bay Area Air Quality Management District
BEA	Bureau of Economic Analysis
BLM	Bureau of Land Management
BOEM	Bureau of Ocean Energy Management
BP	Before Present
CAMSPAC	Communications Area Master Station Pacific
CARB	California Air Resources Board
CBNMS	Cordell Bank National Marine Sanctuary
CCA	California Coastal Act
CCAA	California Clean Air Act
CCNM	California Coastal National Monument
CDFG	California Department of Fish and Game
CDFW	California Department of Fish and Wildlife
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability System
CESA	California Endangered Species Act
CFIS	California Fishery Information System
CFR	Code of Federal Regulations
CPFV	Commercial passenger fishing vessel
CSLC	California State Lands Commission
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
DEIS	Draft Environmental Impact Statement
DHS	Department of Homeland Security
DMP	Draft management plan
DOD	Department of Defense
DOI	Department of the Interior
DPS	Distinct population segment

DST	Dover sole, thorneyheads, and sable fish
ECA	Emissions Control Area
EEZ	Exclusive Economic Zone
EFH	Essential Fish Habitat
EIR	Environmental Impact Report
ENSO	El Niño/Southern Oscillation
ESA	Endangered Species Act
ESU	Evolutionarily significant unit
FAA	Federal Aviation Administration
FCAA	Federal Clean Air Act
FERC	Federal Energy Regulatory Commission
FMPs	Fishery management plans
FWPCA	Federal Water Pollution Control Act
GHG	Greenhouse gas
GRT	Gross registered tons
HAPC	Habitat Areas of Particular Concern
IFQ	Individual fishing quota
IMO	International Maritime Organization
JMPR	Joint Management Plan Review
LCP	Local Coastal Program
LME	Large Marine Ecosystem
MARPOL	Marine Plastic Pollution and Control Act
MBNMS	Monterey Bay National Marine Sanctuary
MBTA	Migratory Bird Treaty Act
MHK	Marine and hydrokinetic energy
MHWL	Mean high water line
MLMA	Marine Life Management Act
MLPA	Marine Life Protection Act
MMA	Marine Managed Area
MMPA	Marine Mammal Protection
MOTCO	Military Ocean Terminal
MPA	Marine Protected Area
MPCD	Marine pollution control device
MPRSA	Marine Protection, Research, and Sanctuaries Act
MPWC	Motorized personal watercraft
MS4	Municipal separate storm sewer system
MSA	Magnuson-Stevens Fishery Conservation and Management Act
MSD	Marine Sanitation Device
NAAQS	National ambient air quality standard

NAICS	North American Industry Classification System
NANPCA	National Aquatic Nuisance Prevention and Control Act
NCAB	North Coast Air Basin
NCP	National Contingency Plan
NDZ	No Discharge Zone
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service or NOAA Fisheries
NMSA	National Marine Sanctuaries Act
NMSS	National Marine Sanctuary System
NOAA	National Oceanic and Atmospheric Administration
NOS	National Ocean Service
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NRHP	National Register of Historic Places
OCS	Outer Continental Shelf
OCSLA	Outer Continental Shelf Lands Act
OGV	Ocean-going vessel
ONMS	Office of National Marine Sanctuaries
OREP	Office of Renewable Energy Programs
OTEC	Ocean Thermal Energy Conversion
PDO	Pacific (inter)Decadal Oscillation
PFMC	Pacific Fishery Management Council
PISCO	Partnership for Interdisciplinary Studies of Coastal Oceans
PM10	10-micron particulate matter
PM2.5	2.5-micron particulate matter
PRNS	Point Reyes National Seashore
PWSA	Ports and Waterways Safety Act
RCA	Rockfish Conservation Area
RCRA	Resource Conservation and Recovery Act
RHA	Rivers and Harbors Appropriations Act
ROD	Record of Decision
ROV	Remotely operated vessel
SAC	Sanctuary Advisory Council
SCWA	Sonoma County Water Agency
SFAB	San Francisco Air Basin
SF-DODS	San Francisco Deep Ocean Disposal Site
SHPO	State Historic Preservation Officer
SLA	Submerged Lands Act

sVGP	small Vessel General Permit
SWPZ	Special Wildlife Protection Zone
SWRCB	State Water Resources Control Board
SWQPA	State water quality protection area
THPO	Tribal Historic Preservation Officer
TMDL	Total maximum daily load
TRACEN	U.S. Coast Guard Training Center
TSS	Traffic Separation Scheme
UNDS	Uniform National Discharge Standards
USACE	U.S. Army Corps of Engineers
USAF	U.S. Air Force
U.S.C.	United States Code
USCG	U.S. Coast Guard
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
UTRR	Undiscovered technically recoverable reserves
VGP	Vessel General Permit
VMRS	Vessel Movement Reporting System
VTS	Vessel Traffic Service
VTSS	Vessel traffic service/separation

EXECUTIVE SUMMARY

Background, Purpose and Need

This Draft Environmental Impact Statement (DEIS) is an evaluation of the potential environmental impacts of expanding the boundaries of Cordell Bank and Gulf of the Farallones national marine sanctuaries and establishing regulations for the management of the expanded sanctuaries. This DEIS also evaluates proposed regulatory changes that would apply to existing sanctuary boundaries. NOAA is considering expansion of CBNMS and GFNMS to an area north of the existing sanctuaries that extends from Bodega Bay in Sonoma County, to just south of Alder Creek in Mendocino County, and west beyond the continental shelf.

The draft management plans (DMP) for each sanctuary are published separately. They include information about the sanctuaries' environment and resources, regulations and boundaries, staffing and administration, priority management issues, and actions proposed to address them over the next five to ten years. The National Oceanic and Atmospheric Administration's (NOAA) Office of National Marine Sanctuaries (ONMS) is the lead agency for this proposed project.

This DEIS has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969 (42 United States Code (U.S.C.) § 4321 *et seq.*,) and its implementing regulations (40 Code of Federal Regulations (CFR) Parts 1500-1508). This DEIS presents information to understand the potential environmental consequences of the proposed action and alternatives.

Section 304(a)(4) of the NMSA requires that "terms of designation may be modified only by the same procedures by which the original designation is made." When CBNMS and GFNMS were under consideration for establishment under the NMSA, EISs were prepared prior to their designations as required by the NMSA. As such, since the proposed action would modify the sanctuaries' terms of designation, the NMSA requires preparation of an EIS regardless of the significance of the impacts of the alteration.

Background

In 2001, NOAA received public comment during joint management plan review scoping meetings requesting that CBNMS and GFNMS be expanded north and west. In response, the revised sanctuary management plans completed in 2008 include strategies to facilitate a public process to ensure that boundaries are inclusive of the area's natural resource and ecological qualities, including the biogeographic representation of the area.

Since 2003, sanctuary advisory councils from both sites have regularly discussed expansion northward of the sanctuaries. Beginning in 2004, then Congresswoman Lynn Woolsey, joined later by Senator Barbara Boxer, repeatedly introduced legislation to expand both of these national marine sanctuaries. Interest in

expanding CBNMS and GFNMS stemmed from a desire to protect the biologically productive underwater habitat and important upwelling center that is the source of nutrient rich waters.

At times during review of the proposed expansion legislation, NOAA expressed support for the expansion, including the boundary option the legislation proposed. In 2008, the joint management plan review for CBNMS and GFNMS included strategies for the managers of these sanctuaries to facilitate a public process within five years to evaluate boundary alternatives that ensured maintenance of the area's natural ecosystem, including its contribution to biological productivity. The aim was to ensure the sanctuaries' boundaries were inclusive of the area's natural resource, ecological qualities, and biogeographic representation of the area. Accordingly, in compliance with Section 304(e) of the National Marine Sanctuaries Act (NMSA; 16 U.S.C. § 1431 *et seq.*,) NOAA initiated the public process in December 2012 to evaluate and assess a proposed expansion of the sanctuaries. In doing so, NOAA is considering extending, and as necessary amending, the regulations and management plan for CBNMS and GFNMS to this area. Additional information on the background of the proposed action is available at http://farallones.noaa.gov/manage/expansion_cbgf.html.

Project Location

Figure ES-1 shows the regional location of the proposed expansion area, including the existing and proposed sanctuary boundaries and surrounding area. The proposed expansion area covers the offshore coastal area from Bodega Bay in Sonoma County to a point just south of Alder Creek in Mendocino County. It also includes extension of CBNMS farther west offshore of Marin County and north to include Bodega Canyon. The total expansion area is 2771 square miles (sq miles) (2093 square nautical miles [sq nm]). Approximately 757 sq miles (572 sq nm) of offshore ocean waters and the submerged lands under those waters would be added to the existing CBNMS size of 528 sq miles (399 sq nm), for a total size of approximately 1286 sq miles (971 sq nm). The expanded GFNMS area would be north of the existing GFNMS and would add approximately 2014 sq miles (1521 sq nm) to the existing 1279 sq miles (966 sq nm) sanctuary, with a total size of approximately 3297 sq miles (2490 sq nm) (including the additional four sq miles of restored wetlands on the Giacomini property).

Purpose and Need

The purpose of this action, expansion of CBNMS and GFNMS to an area north and west of their current boundaries, is to extend national marine sanctuary protection to an area that has significant marine resources and habitats and is the source of nutrient-rich upwelled waters for the existing marine sanctuaries. This expansion would encompass a globally significant coastal upwelling center originating off Point Arena and flowing into GFNMS and CBNMS via wind driven currents. The proposed action would also carry over existing regulations into the expansion area, amend current regulations for GFNMS and CBNMS, and add new regulations. These regulatory changes would provide for comprehensive management and protection of the resources of the area encompassed by the current sanctuaries and the proposed expansion area.

Expansion of CBNMS and GFNMS to this area would protect one of the most consistent and intense coastal upwelling centers in all of North America and the spectacular marine ecosystem along the southern Mendocino and Sonoma Coast. Because of effects related to coastal topography and ocean circulation,

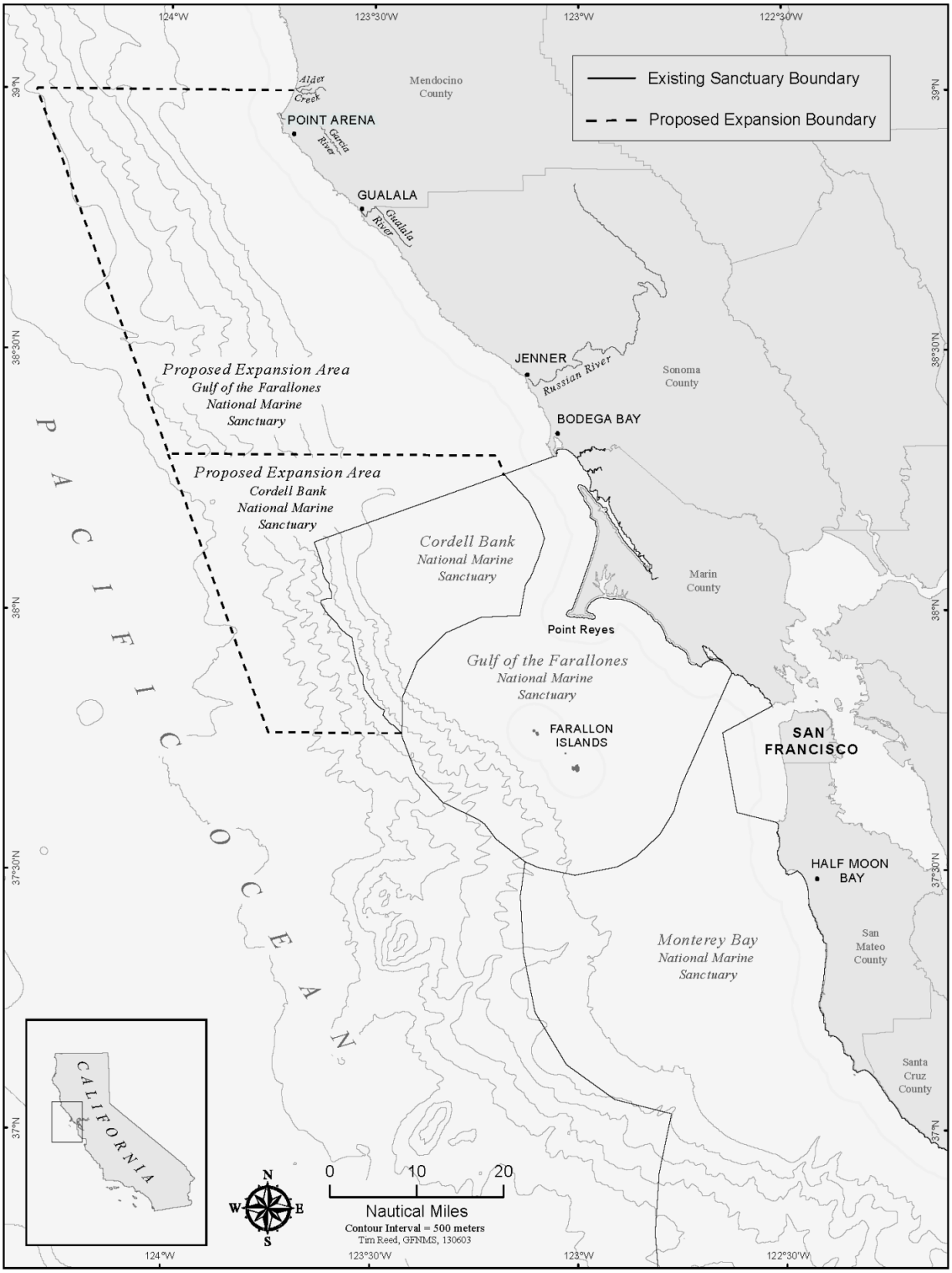

Figure ES-1. Regional Location of Proposed Expansion Area

upwelling at Point Arena is concentrated into a strong center or 'cell' distinctly different from upwelling along the California Current (see Figure 4.3-1 in Section 4.3 [Biological Resources]). The Point Arena upwelling center is largely separate from upwelling to the north and strongly linked with areas to the south; analysis of ocean currents, water properties, and chlorophyll show a strong association between water upwelled at Point Arena and coastal water masses off southern Mendocino, Sonoma and Marin Counties (Halle and Largier 2011). Upwelling currents at Point Arena carry nutrients to the surface where the prevailing wind driven surface currents transport the nutrient filled waters south along the Mendocino and Sonoma coast to the waters over Cordell Bank and around the Farallon Islands. These nutrients are the foundation of the food rich environment in the study area and promote the growth of organisms at all levels of the marine food web. The nutrients flowing from this upwelling center form the basis of support for a range of species, from plankton to predators. Cordell Bank is densely covered with invertebrates, and has hundreds of species of fish, seabirds and marine mammals in the ocean waters above and around it. Bodega Canyon is a prominent submarine feature in close proximity to Cordell Bank. This seafloor feature cuts across the continental shelf and slope north of Cordell Bank. Submarine canyons provide areas of high bathymetric complexity, support deep water communities, and effect local and regional circulation patterns. Bodega Canyon provides habitat for adult stages of groundfish including rockfish and flatfish that rear in nearshore waters and move offshore in their adult stages. In addition, offshore canyons and other bathymetric features are important foraging areas for seabirds and marine mammals. Offshore waters of the study area support large populations of krill, which are keystone species and form the basis of a productive marine food web.

The action would connect key geographic components of the Point Arena upwelling system, extending sanctuary boundaries from the source waters of the nutrient-based food web to existing areas of high biological productivity around the Farallon Islands and Cordell Bank. In addition, the thriving marine ecosystems along and offshore of southern Mendocino and Sonoma Counties would receive sanctuary protection. Expansion of the sanctuaries would also protect nationally significant seascapes and shipwrecks, and recreational and commercial uses, including fisheries, in the area.

The proposed expansion area's nutrient-rich waters are integral parts of the overall marine ecosystem for these sanctuaries but are currently outside the sanctuaries' boundaries. The upwelled water that emanates from Point Arena is the regional ecosystem driver for productivity in coastal waters of north central California. The source waters of CBNMS and GFNMS are not afforded the needed level of protections, management actions and programs that national marine sanctuaries provide. Including this area within CBNMS and GFNMS is critical to help conserve and protect resources by preventing or reducing human-caused impacts such as marine pollution and seabed disturbance, which have the potential to impact the proposed expansion area as well as downstream areas. The biological communities of these national marine sanctuaries are susceptible to damage from these and other select human activities. Additional protection is needed for the food-rich water flowing south from the Point Arena area that supports a marine food web made up of many species of algae, invertebrates, fish, seabirds, and marine mammals. Some species are transitory, travelling hundreds or thousands of miles to the region, such as endangered blue whales, albatross, shearwaters, king salmon, white and salmon sharks, while others live year round in the sanctuaries, such as Dungeness crab, sponges, other benthic invertebrates and many species of rockfish. Of note, the largest assemblage of breeding seabirds in the contiguous United States is at the

Farallon Islands, and each year their breeding success depends on a healthy and productive marine ecosystem so nesting adults and fledgling young can feed and flourish.

Existing laws and policies for the Point Arena upwelling area and south do not provide comprehensive and coordinated conservation and management to protect resources, and application of the NMSA through the sanctuaries' expansion would provide this needed safeguard while facilitating uses compatible with resource protection. In addition, community members and members of Congress have expressed their desire for and the need to ensure better protection of the sanctuaries' resources. Management of these nationally significant places under the National Marine Sanctuaries Act would provide protection through regulations pertaining to: discharge, altering the seabed, taking and possessing certain species, disturbing historical resources, introducing introduced species, attracting white sharks, approaching white sharks in certain designated zones, deserting a vessel, prohibiting oil, gas and minerals exploration, operating motorized personal watercrafts, flying aircrafts below 1,000 feet in certain designated zones, sailing cargo vessels in certain designated zones, prohibiting interference with an investigation, and providing the ability for GFNMS to authorize permits for certain currently prohibited activities, such as discharge and alteration of the submerged land in the sanctuary.

Scope of EIS

This EIS evaluates the environmental impacts associated with expansion of both CBNMS and GFNMS. Alternatives to the proposed action consist of slight variations in the proposed regulations and several localized boundary options. This EIS focuses on the regulatory changes that could affect the environment. Since the proposed action includes several modifications to existing sanctuary regulations, there are implications for the existing sanctuaries as well that are evaluated in this EIS.

Because there are specific proposed boundary and regulatory changes, both sanctuaries' terms of designation must be amended to establish authority for the new or modified regulations and boundaries (see Appendix D). These revisions, which are narrow in scope and correspond directly to the proposed boundary and regulatory changes, are included as part of the proposed action evaluated in this EIS.

Decisions to be Made

Decisions related to the proposed action include the following:

- Expansion of CBNMS and GFNMS boundaries;
- Proposed changes to the terms of designation for CBNMS and GFNMS;
- Proposed changes to regulations for CBNMS and GFNMS; and
- Revised management plans for CBNMS and GFNMS.

Public and Agency Involvement

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]).

Scoping

On December 21, 2012, NOAA published a notice of intent (NOI) in the Federal Register, which notified the public of the proposed action, announced the three public scoping meetings, and solicited public comments. ONMS held public scoping meetings in Bodega Bay on January 24, 2013, Point Arena on February 12, 2013 and Gualala on February 13, 2013. Several hundred people participated in these meetings and provided input on specific issues to be analyzed or addressed as part of the environmental analysis for the proposed expansion of the sanctuary boundaries.

In addition to public scoping meetings, ONMS accepted written comments from December 21, 2012 to March 1, 2013. Comments were provided in the form of e-mails, letters, faxes, and electronic submissions on http://www.regulations.gov. During the comment period, the agency received over 300 comments. A website http://farallones.noaa.gov/manage/expansion_cbgf.html serves as a central location of project information while the EIS is being developed. The website provides a link http://www.regulations.gov/#!docketDetail;D=NOAA-NOS-2012-0228 to access all of the scoping comments received on the project.

NOAA is working closely with a variety of pertinent resource agencies on the development of the EIS, the management plans, and the proposed regulations. NOAA has sought the input of numerous federal, state, and local officials and agencies in preparing this DEIS (see Appendix F).

Public Review of the Draft EIS

A public review period of at least 60 days follows the Notice of Availability for publication of the DEIS in the Federal Register. Availability of the DEIS was announced in the Federal Register, on various e-mail lists, on the project website, and in local newspapers. In addition, copies of the DEIS are available for review in numerous locations, such as libraries, throughout the study area (locations will be published with notice of availability in local newspapers). Public hearings will be held no sooner than 30 days after the notice is published in the Federal Register.

During the public comment period, oral and written comments are anticipated from federal, state, and local agencies and officials, from organizations, and from interested individuals. After the public comment period is over, the comments will be reviewed. A summary of these comments and the corresponding responses from the agency will be included in the Final EIS. If necessary, changes will be made to the EIS as well as the proposed rule and draft management plans as a result of the public comments.

If NOAA moves forward with a final action, it will issue a Final EIS, after which a 30-day mandatory waiting period will occur, and then NOAA may issue its record of decision (ROD). In addition, a final rule that promulgates changes to the regulations and terms of designation of the sanctuaries would be published in the Federal Register.

Summary of Proposed Action and Alternatives

There are a total of five alternatives, several of which are sub-alternatives:

- The proposed action includes modifications to the existing sanctuary regulations and expansion of the boundaries of both the CBNMS and GFNMS;

- The existing regulations alternative represents a second regulatory alternative, with the same proposed sanctuary expansion boundary as the proposed action;
- The no action alternative represents the condition in which the sanctuaries are not expanded and the sanctuary regulations are not modified;
- The Arena Cove boundary alternative is a sub-alternative that includes all of Arena Cove in the sanctuary expansion area and could be implemented with either the proposed action regulations or existing regulations alternative; and
- The Motorized Personal Watercraft (MPWC) zone alternative is a sub-alternative to the proposed action, involving slight alterations of proposed MPWC operation zone boundaries.

The alternatives are summarized in the following subsections.

Proposed Action

The proposed action represents the preferred alternative and involves expanding both GFNMS and CBNMS boundaries, as well as applying a set of sanctuary regulations that have been tailored for more targeted protection of the area's resources. Some of the GFNMS and CBNMS regulations would be extended to the expansion area without changes, some existing regulations would be altered and applied to both the existing and expanded sanctuaries, and some new regulations would be added in order to best suit the resource protection needs of the expanded sanctuaries. Each sanctuary's terms of designation would be modified to reflect the expanded boundaries, and each sanctuary's management plan would be updated.

Boundary Area

The proposed action involves expanding the boundaries of CBNMS and GFNMS to include waters and submerged lands offshore Sonoma and Mendocino Counties. The overall expansion area would be to the north and west, encompassing waters adjacent to the Sonoma coast and a portion of the Mendocino coast up to a point just south of Alder Creek. The western boundary would be generally aligned with the 1500 fathom depth contour. The northern area would become part of GFNMS. The proposed CBNMS expansion area includes area to the north and west of the existing sanctuary, offshore Marin County. The proposed boundaries are shown in Figure ES-1.

Proposed Regulations

Since the proposed action includes expansion of both CBNMS and GFNMS, the expansion area would be subject to NOAA regulations (CFR Title 15, Part 922) that apply to national marine sanctuaries (Subparts A, D and E, unless noted otherwise) and to the individual regulations of these two sanctuaries (Subparts K and H, respectively). There are several slight differences between the regulations of the two sanctuaries. The regulations for both sanctuaries include definitions, prohibited activities and other regulated uses and permit processes and issuance criteria. In order to design the sanctuary regulations for the existing and anticipated uses in both the current sanctuaries and the proposed expansion area, the existing regulations of CBNMS and GFNMS would be slightly modified. These revisions would apply to both the existing sanctuaries and proposed expansion area. The proposed regulations for the two sanctuaries are described

below and any substantive differences between existing and proposed regulations are noted. The full text of the proposed regulations is included in the proposed rule, published by NOAA in the Federal Register.

CBNMS

The following prohibitions and permit requirements as modified from current regulations would be applied to both the existing sanctuary and the expansion area. Regulations that are new or substantially modified from existing regulations are noted with an asterisk (*).

Prohibited Activities

The following activities would be prohibited within the sanctuary (including both existing sanctuary and proposed sanctuary expansion area[1]:

- Oil, gas or mineral exploration, development or production.
- Discharging or depositing into the sanctuary, other than from a cruise ship, any material except:
  - Fish, fish parts, chumming materials or bait, used in lawful fishing;
  - For a vessel less than 300 gross registered tons (GRT):
    - clean effluent generated incidental to vessel use and generated by an operable Type I or II marine sanitation device (MSD; U.S. Coast Guard classification); and
    - clean graywater*[2];
  - For a vessel 300 GRT or greater without sufficient tank capacity to hold sewage and/or graywater while within the sanctuary:
    - clean effluent generated incidental to vessel use and generated by an operable Type I or II marine sanitation device (U.S. Coast Guard classification); and
    - clean graywater*;
  - Clean vessel deck wash down, clean vessel engine cooling water, clean vessel generator cooling water, clean bilge water, or anchor wash; or
  - Vessel engine or generator exhaust.
- Discharging from a cruise ship except clean vessel engine cooling water, clean vessel generator cooling water, vessel engine or generator exhaust, clean bilge water, or anchor wash.
- Discharging or depositing, from beyond the boundary of the sanctuary, any material that subsequently enters the sanctuary and injures a sanctuary resource or quality, with the same exceptions as listed above.

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1 The order of prohibitions has been modified from the order in the existing regulations.

2 Graywater is defined in section 312 of the Clean Water Act as galley, bath, and shower water. Clean means not containing detectable levels of harmful matter.

- Removing, taking, or injuring benthic invertebrates or algae located on or within the line representing the 50-fathom isobath surrounding Cordell Bank. (This prohibition does not apply to use of bottom contact gear used during fishing activities, which is prohibited pursuant to 50 CFR part 660 (Fisheries off West Coast States)).
- Drilling into, dredging, or otherwise altering the submerged lands within the line representing the 50-fathom isobath surrounding Cordell Bank; or constructing, placing, or abandoning any structure or material on or in the submerged lands. (This prohibition does not apply to use of bottom contact gear used during fishing activities, which is prohibited pursuant to 50 CFR part 660 (Fisheries off West Coast States)).
- Beyond the line representing the 50-fathom isobath surrounding Cordell Bank, drilling into, dredging, or otherwise altering the submerged lands; or constructing, placing, or abandoning any structure or material on the submerged lands except for anchoring any vessel or lawful use of any fishing gear.
- Taking any marine mammal, sea turtle, or bird, except as authorized by existing regulations.
- Possessing within the sanctuary any marine mammal, sea turtle or bird taken, except as authorized by existing regulations or as necessary for law enforcement purposes.
- Possessing, moving, removing, or injuring a sanctuary historical resource.*
- Introducing or otherwise releasing an introduced species, except striped bass (*Morone saxatilis*) released during catch and release fishing activity.
- Interfering with an investigation, search, seizure, or disposition of seized property in connection with enforcement of regulations.*

Exceptions and Authorizations

There are proposed exceptions to the above prohibitions, as well as a new proposed authorization procedure to allow certain activities:

- Exceptions for Emergencies – The above prohibitions do not apply to activities necessary to respond to an emergency threatening life, property or the environment, or as may be permitted by the Sanctuary Superintendent, with authority delegated by the ONMS Director, in accordance with criteria outlined in 15 CFR § 922.48 (National Marine Sanctuary permits – application procedures and issuance criteria) and specifically allowed within the CBNMS permit procedures and criteria 15 CFR § 922.113.
- Department of Defense – All activities carried out by the Department of Defense (DOD) on the effective date of expansion that are necessary for national defense are exempt from the above prohibitions; other such activities will be exempted after consultation between the Department of Commerce and the DOD. DOD activities not necessary for national defense, such as routine exercises and vessel operations, are subject to all prohibitions contained in the regulations in this subpart.
- Authorizations* – A new authorization authority would establish a mechanism for the sanctuary to potentially allow several specific prohibited activities within the existing sanctuary and the proposed

expansion area if they were approved by another authorizing entity and subject to terms and conditions of the sanctuary. This change would have implications for the existing sanctuary as well as the proposed expansion area. Activities potentially allowed by authorization would include discharges, submerged lands alteration beyond the line representing the 50-fathom isobath surrounding Cordell Bank, taking or possessing marine wildlife and possessing or injuring historic resources. Under no circumstance would oil or gas development be allowed.

- Emergencies – Where necessary to prevent immediate, serious, and irreversible damage to a sanctuary resource, any activity may be regulated on an emergency basis for up to 120 days.

Permits

The proposed regulations would extend permit procedures and criteria for issuing permits currently established in the sanctuaries to the expansion area. With authority delegated by the ONMS Director, the Sanctuary Superintendent may issue a permit for activities prohibited above, subject to terms and conditions. A permit may be issued for activities that will: further research or monitoring related to sanctuary resources and qualities; further the educational value of the sanctuary; further salvage or recovery operations in or near the sanctuary; or assist in managing the sanctuary. In no event may a permit be issued to allow oil, gas or mineral exploration, development or production.

GFNMS

For the proposed action, GFNMS would include similar new provisions listed above for CBNMS, as well as additional modified prohibitions. These regulations would be applied to the entire sanctuary, both existing and expanded boundaries. New or substantially modified regulations are noted with an asterisk (*).

Prohibited Activities

Several of the proposed prohibitions are the same as CBNMS, including prohibitions of: oil, gas or mineral development, discharges, taking any marine mammal, sea turtle, or bird, possessing any marine mammal, sea turtle, or bird, possessing, moving, removing, or injuring a sanctuary historical resource, and interfering with enforcement action*. In addition, the following activities would be prohibited within GFNMS (15 CFR 922.82, Prohibited or otherwise regulated activities):

- Constructing any structure other than a navigation aid on or in the submerged lands of the sanctuary; placing or abandoning any structure on or in the submerged lands of the sanctuary; or drilling into, dredging, or otherwise altering the submerged lands of the sanctuary in any way, except:
  - By anchoring vessels;
  - While conducting lawful fishing activities;
  - Routine maintenance and construction of docks and piers on Tomales Bay; or
  - Mariculture activities conducted pursuant to a valid lease, permit, license or other authorization issued by the State of California.
- Operating motorized personal watercraft (MPWC), except:

- For emergency search and rescue missions or law enforcement operations (other than routine training activities) carried out by the National Park Service, U.S. Coast Guard, Fire or Police Departments or other Federal, State or local jurisdictions; or
- For a MPWC equipped with a GPS unit within four designated zones in the expansion area of the sanctuary.*

The four proposed MPWC zones would avoid the proposed Special Wildlife Protection Zones (SWPZs) and include traditional coastal access points. The proposed MPWC zones would be located as follows (see Chapter 3, Description of Proposed Action and Alternatives, for maps of proposed locations):

- Zone 1 (From latitude 39 to Arena Cove) (Area: 6.4 sq nm) – This seasonal zone would be open from October to February. It would be closed from March to September to limit potential negative interactions with MPWC landing on Manchester beach during the time that Snowy Plovers, listed as threatened by the Endangered Species Act, nest on beach.
- Zone 2 (From Arena Cove to Havens Neck) (Area: 19.8 sq nm) – Prominent visual markers at Arena Cove, Moat, Saunders Landing, Iverson Landing and Haven's Neck would be used to define the eastern boundary. The proposed zone would require MPWC users to stay seaward of all the listed points at all times. Use of waypoints at each of the shoreside locations would help operators with compliance.
- Zone 3 (Timber Cove) (Area: 2.9 sq nm) – Zone 3 would be accessed through a boat ramp at Timber Cove.
- Zone 4 (From Bodega Head to Coleman Beach) (Zone Area: 4.5 sq nm; Access Area: 0.3 sq nm) – A 100-yard access route from Bodega Harbor using the harbor entrance and two navigational buoys would allow entrance to the southern boundary of the zone. Seasonal access would also be available through Salmon Creek, at Bean Avenue and the Ranger's Station (see Figure 3.2-15).

■ 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 — same as CBNMS; or species cultivated by mariculture activities in Tomales Bay pursuant to a valid lease, permit, license or other authorization issued by the State of California and in effect on the effective date of the final regulation.

■ Disturbing marine mammals or seabirds by flying motorized aircraft at less than 1000 feet over the waters within the seven designated SWPZs except to transport persons or supplies to or from the Farallon Islands or for enforcement purposes. Failure to maintain a minimum altitude of 1000 feet above ground level over such waters is presumed to disturb marine mammals or seabirds.*

■ Operating any cargo vessel engaged within an area extending one nm from a designated SWPZ.*

As part of these two regulations that reference SWPZs, the sanctuary would designate SWPZs instead of continuing to use Areas of Special Biological Significance (ASBS) and other specified locations. There would be a total of five SWPZs in the current sanctuary boundaries, which would be subject to protection from cargo vessel traffic and low flying aircraft. These zones include: Tomales Point, Point

Reyes, Duxbury Reef-Bolinas Lagoon, and two zones at the Farallon Islands (shown in Figures 3.2-4, 3.2-5, 3.2-6 and 3.2-7 in Chapter 3). Two zones would be created in the proposed expansion area near Gualala and Fort Ross (see Figures 3.2 8 and 3.2-9 in Chapter 3). They would be established in areas of high biological diversity and/or abundance of species including federally listed and specially protected species. SWPZs would be established where biological resources are susceptible to disturbance and need protection from certain activities that could harm these sensitive resources.

The existing GFNMS regulations use a combination of specified locations and State ASBS to protect sensitive seabird and pinniped areas from cargo vessel disturbance or discharge, and from low flying aircraft disturbance. ASBS are those areas designated by California's State Water Resources Control Board as requiring protection of species or biological communities to the extent that alteration of natural water quality is undesirable. ASBS are a subset of State Water Quality Protection Areas established pursuant to California Public Resources Code section 36700 et seq. These areas were designated based on the presence of certain species or biological communities that, because of their value or fragility, deserve special protection by preserving and maintaining natural water quality conditions to the extent practicable.

Within the existing GFNMS boundaries, ASBS coincide with areas of high biological diversity and/or abundance of species, but the ASBS in the expansion area are not in locations that could provide adequate protections to wildlife if used for proposed cargo vessel or low flying aircraft prohibitions. Therefore, SWPZs are proposed to better reflect resource areas needing protection from cargo vessels and low flying aircraft and to provide consistency between the existing and proposed boundary areas.

In the existing sanctuary boundaries, the proposed boundaries of the new SWPZs are very similar to the areas currently protected from cargo vessels and low flying aircraft, which were defined as areas including a two nautical mile buffer or one nautical mile buffer, respectively, around the Farallon Islands, Bolinas Lagoon or any ASBS. A new definition to describe SWPZs, which approximately cover the areas where the low flying aircraft regulation currently apply, would be added to the GFNMS regulations. Cargo vessels would be required to sail at least one nautical mile from any SWPZ. The proposed new cargo vessel prohibition would remain similar in size and location to the areas currently protected from cargo vessels. Therefore, this proposed change in the current boundaries would result in a negligible change for transiting cargo vessels.

- Attracting a white shark in the sanctuary; or approaching within 50 meters of any white shark within one nautical mile of, and inside, the newly designated SWPZs around Southeast and North Farallon Islands. Currently, NOAA prohibits approaching within 50 meters of a white shark within two nautical miles of the Farallon Islands to prevent harassment and reduce disturbance of white sharks. The location and size of the zones would remain effectively similar to the current prohibition at both the Southeast and North Farallon Islands, however, the area around Middle Farallon Island would be removed resulting in a total area that is smaller than the existing zone. The previous zone was circular and surrounded all the Farallon Islands. The two new zones would be changed to a polygon and match the cargo vessel prohibition zones by creating a one nautical mile buffer around proposed SWPZs 6 and 7. Deserting a vessel aground, at anchor, or adrift in the sanctuary.
- Leaving harmful matter aboard a grounded or deserted vessel in the sanctuary.

- Anchoring a vessel in a designated seagrass protection zone in Tomales Bay, except as necessary for mariculture operations conducted pursuant to a valid lease, permit or license.

Exceptions and Authorizations

There are proposed exceptions to the above prohibitions, as well as a proposed authorization procedure to allow certain activities:

- Exceptions for Emergencies – same as CBNMS.

- Department of Defense – The exemption for DOD activities would be similar to the exemption in CBNMS. All activities currently carried out by DOD are considered essential for national defense and not subject to the prohibitions listed above. Any additional activities would be exempted only after consultation with the Sanctuary Superintendent and the Department of Defense.

- Authorizations* – As with CBNMS, this new authorization authority would potentially allow some specific otherwise prohibited activities listed above if they are authorized by a lease, permit, license, approval, or other authorization issued by another agency. As with CBNMS, this change would have implications for the existing sanctuary as well as the proposed expansion area. Activities potentially allowed by authorization would include discharges, construction on submerged lands, operating MPWC, taking or possessing marine wildlife and possessing or injuring historic resources. Introduction of a non-invasive introduced species from shellfish mariculture in State waters may also be allowed in GFNMS under this authorization process. Under no circumstance would oil, gas or minerals development be allowed.

Permits

The proposed GFNMS regulations would provide a permit process for otherwise prohibited activities and criteria for issuing permits, similar to the proposed CBNMS permit provisions, including findings listed above for CBNMS. The proposed regulations would extend permit procedures and criteria for issuing permits currently established in the sanctuary to the expansion area.

No Action Alternative

Evaluation of a No Action alternative is required under NEPA. The No Action alternative is equivalent to the status quo, with regard to sanctuary boundaries and regulations. No boundary adjustments would be made to include additional north central coast waters and no changes would be made to existing regulations or the terms of designation for either sanctuary. All management practices currently occurring in the north coast offshore area would continue. The No Action alternative would involve continuing to implement the current management plans and regulations for the two sanctuaries. Future development and activities in the proposed expansion area would be subject to existing federal and state regulations. No added protection of biological resources, water quality or cultural resources would be provided and the various educational and monitoring programs outlined in the sanctuary management plans would not be implemented in the proposed expansion area.

Existing Regulations Alternative

This alternative differs from the proposed action only in the application of regulations. The boundaries of each sanctuary would be the same as described for the proposed action. All relevant existing regulations for both GFNMS and CBNMS would be applied to their expanded boundaries. There would be no changes in regulations from those currently in effect. The differences from the proposed action are summarized as follows for each sanctuary.

CBNMS

- There would be no authorization process to potentially allow certain otherwise prohibited activities that are approved pursuant to a valid Federal, state or local lease, permit, license, approval or other authorization mechanism. The sanctuary could issue permits under its general permit authority, which would be limited to activities that: further research or monitoring related to sanctuary resources and qualities; further the educational value of the sanctuary; further salvage or recovery operations; or to assist management of the sanctuary.
- There would be no exemption for clean graywater discharges.
- Regulations would not prohibit possessing, moving, removing, or injuring historical resources.
- The prohibition against interfering with an enforcement action, as described for the proposed action, would not be included in this alternative.
- Permit procedures would not be modified to clarify that the regulations prohibit in all cases the issuance of national marine sanctuary permits for oil, gas or mineral exploration, development, or production. However, oil and gas facilities would be clearly listed as prohibited activities, as in the current regulations.

GFNMS

- Similar to CBNMS, the following changes outlined in the proposed action would not be implemented:
  - There would be no authorization authority to potentially allow certain otherwise prohibited activities except that oil and gas pipelines and non-invasive introduced species could be authorized in certain conditions. As with CBNMS, existing permitted uses could be certified under the national marine sanctuaries program regulations and the sanctuary could issue permits under its general permit authority which are the same as CBNMS.
  - There would be no exemption for clean graywater discharges.
  - The prohibition against interfering with an enforcement action would not be included in this alternative.
  - Permit procedures would not be modified to clarify that the regulations prohibit in all cases the issuance of general permits for oil, gas or mineral exploration, development, or production. However, oil and gas facilities would be clearly listed as prohibited activities, as in the current regulations.
- The existing exemption for oil and gas pipelines in GFNMS would remain, as described in the existing regulations, which would allow pipelines under specific conditions.

- MPWC operation would be prohibited in the expansion area, as it currently is prohibited within the existing GFNMS, without any zones where MPWC operation would be allowed, except when necessary for rescue/safety activities conducted by appropriate public safety agencies, as provided in the existing regulations.
- Cargo vessel prohibition areas would be designated within an area extending 2 nm from the existing ASBS in the expansion area: Saunders Reef, Del Mar Landing, Gerstle Cove and Bodega rather than establishing Special Wildlife Protection Zones, as described for the proposed action. Cargo vessel prohibition areas in the existing sanctuary would continue as they currently exist.
- Low overflight prohibitions would be designated within an area extending one nm at the four ASBS in the expansion area: Saunders Reef, Del Mar Landing, Gerstle Cove and Bodega. Low overflight prohibitions in the existing sanctuary would continue as they currently exist; no changes to their configuration within the existing sanctuary boundaries would occur.

Arena Cove Alternative

This alternative provides an option for including all of Arena Cove within the GFNMS boundary. This differs from the proposed action in that the proposed action excludes the existing pier and waters east (shoreward) of the pier. The boundary would extend to the Arena Cove mean high water line (MHWL) on the shore and would include docks, a pier and all moorings in Arena Cove. This boundary option could be implemented with either the proposed action targeted regulations or with the existing sanctuary regulations alternative.

MPWC Zones Alternative

This alternative provides different boundaries for two of the proposed MPWC zones in the GFNMS expansion area, as described below. There are two alternatives for MPWC Zone 2 and one alternative for Zone 4. The regulations and management plan would be the same as described for the proposed action.

- Zone 2A (From Arena Cove to Havens Neck) (Area 19.8 sq nm) – This alternative zone would create an offshore buffer of 1000 feet to keep MPWC away from the nearshore environment. It would allow for access closer to coves between Moat and Saunders Landing, and between Iversen Landing and Haven's Neck, and would be 0.2 sq nm larger than Zone 2 in the proposed action.
- Zone 2B (From Arena Cove to Havens Neck) (Area 21.5 sq nm) – The boundary of this alternative zone would go to the MHWL and would be 1.9 sq nm larger than Zone 2 in the proposed action. This option would allow MPWC users to land their craft at the two small beaches in this zone, in areas where there is not known breeding seabird colonies or pinniped pupping sites.
- Zone 4A (From Bodega Head to Duncan's Point) (Zone Area 4.3 sq nm; Access Area 0.3 sq nm) – This alternative zone would include, as its only entrance point, a 100-yard access route from Bodega Harbor to the zone using the harbor entrance and two navigational buoys. To further minimize the potential for nearshore impacts on wildlife, it would not allow access from Salmon Creek, Bean Avenue or the Ranger Station at Sonoma Coast State Beach. It would allow access farther north to Duncan's Point, a prominent landmark.

Summary of Impacts

Table ES-1 provides a summary of the impacts identified for the proposed action, the no action alternative, existing regulations alternative, Arena Cove boundary sub-alternative and MPWC zone alternative. None of the alternatives would result in a significant adverse impact on any of the resources or uses in the existing CBNMS or GFNMS or proposed expansion areas of the two sanctuaries. The two regulatory alternatives — the proposed action and existing regulations alternative — would result in similar beneficial impacts on natural resources and similar adverse impacts on other uses in the proposed expansion area.

Table ES-1. Summary of Potential Resource Impacts					
Resource	**Proposed Action**	**No Action Alternative**	**Existing Regulations**	**Arena Cove Boundary Alternative**	**MPWC Zones Alternative**
Physical Resources					
Air Quality and Climate	**+** Minor benefits from discharge prohibitions	**O** Status quo	**+** Same as proposed action	**+** Minor increase in benefit over proposed action due to larger area protected by sanctuary regulations	**+** Same as proposed action
Oceanography and Geology	**+** Minor benefits from seabed disturbance prohibition, however authorization process could allow some construction or other alteration of the seabed.	**O** Status quo	**+** Slightly higher benefits than proposed action due to no authorization process which means that there would be less potential for activities that disturb the seabed	**+** Negligible increase in benefit over proposed action due to larger area protected by sanctuary regulations	NA
Water Quality	**+** Benefits from discharge, enter and injure, vessel abandonment prohibitions; minor adverse impact on existing sanctuaries from proposed exemption for graywater.	**O** Status quo, but lacking the protection offered by the proposed action	**+** Slightly higher benefits than proposed action due to no graywater exemption and no authorization process to allow discharges	**+** Slightly higher benefits than proposed action due to larger area protected by sanctuary regulations	**+** Same as proposed action

Key to symbols:

O = No Impact
~ = Less Than Significant Adverse Impact
– = Significant Adverse Impact (Note: no alternative would result in that level of impact)
+ = Beneficial Impact
NA = Not Applicable

Table ES-1. Summary of Potential Resource Impacts					
Resource	**Proposed Action**	**No Action Alternative**	**Existing Regulations**	**Arena Cove Boundary Alternative**	**MPWC Zones Alternative**
Biological Resources	**+** Benefits from: prohibitions of discharges, seabed disturbance, vessel abandonment, wildlife take and disturbance; establishment of SWPZ and MPWC zones; cargo vessel restrictions; overflight restrictions; oil and gas development prohibition. Slight adverse impact in existing sanctuaries from new graywater exemption and authorization process that may allow activities such as discharges and seabed disturbance.	**O** Status quo, but lacking the protection offered by the proposed action	**+** Slightly higher benefits than proposed action due to no exception for clean graywater discharge, no potential for authorization of prohibited activities such as discharges and seabed disturbance	**+** Slightly higher benefits than proposed action due to larger area protected by sanctuary regulations	**+** Similar to proposed action. Alt. Zone 4A is smaller than the proposed action zone and restricts shoreline access points, which would have a slightly higher level of beneficial impact on biological resources.

Key to symbols:

O = No Impact
~ = Less Than Significant Adverse Impact
– = Significant Adverse Impact (Note: no alternative would result in that level of impact)
+ = Beneficial Impact
NA = Not Applicable

Table ES-1. Summary of Potential Resource Impacts					
Resource	**Proposed Action**	**No Action Alternative**	**Existing Regulations**	**Arena Cove Boundary Alternative**	**MPWC Zones Alternative**
Commercial Fishing and Aquaculture	**+** **~** Beneficial effects on fisheries due to discharge, introduced species and oil and gas prohibitions. Minor adverse effects on fishing operations due to discharge and introduced species prohibitions	**O** Status quo	**+** **~** Slightly higher benefits and adverse impact than proposed action	**+** **~** Same as proposed action	NA
Cultural and Maritime Heritage Resources	**+** Increased protection from prohibition on taking or harming cultural resources; benefit from seabed disturbance prohibition	**O** Status quo, but lacking the protection offered by the proposed action	**+** Similar to proposed action, but no specific prohibition on harming cultural resources in CBNMS, so slightly less protection; slightly more potential protection with no authorization process to allow activities that might disturb cultural resources.	**+** Slightly higher benefit than proposed action due to implementation of protection in the cove	NA
Socioeconomic Resources, Human Uses and Environmental Justice					
Socioeconomics*	**O**	**O**	**O**	**O**	NA

Key to symbols:

O = No Impact
~ = Less Than Significant Adverse Impact
– = Significant Adverse Impact (Note: no alternative would result in that level of impact)
+ = Beneficial Impact
NA = Not Applicable

Table ES-1. Summary of Potential Resource Impacts

Resource	Proposed Action	No Action Alternative	Existing Regulations	Arena Cove Boundary Alternative	MPWC Zones Alternative
Environmental Justice	**O** Low-income and minority populations would not be disproportionately affected	**O**	**O**	**O**	**O**
Tourism	**+** Benefits from potentially improved resource and increased awareness due to sanctuary status	**O**	**+** Same as proposed action	**+** Same as proposed action	NA
Land Use and Development	**~** Some activities prohibited such as pier construction, placement of structures on seabed, unless authorized or permitted by the sanctuary	**O**	**~** Higher level of adverse impact than proposed action; no authorization process to approve new discharges or construction on seabed.	**~** Slightly higher level of adverse impact than proposed action; any future uses would be subject to sanctuary regulations and permits	NA
Recreation	**~** Due to limitations of MPWC and discharge prohibitions	**O**	**~** Higher level of adverse impact than proposed action due to stricter discharge regulations and MPWC prohibition	**~** Same as proposed action	**~** Same as proposed action

Key to symbols:

O = No Impact
~ = Less Than Significant Adverse Impact
– = Significant Adverse Impact (Note: no alternative would result in that level of impact)
+ = Beneficial Impact
NA = Not Applicable

Table ES-1. Summary of Potential Resource Impacts					
Resource	**Proposed Action**	**No Action Alternative**	**Existing Regulations**	**Arena Cove Boundary Alternative**	**MPWC Zones Alternative**
Research and Education	**+** Benefits from sanctuary programs, possible increased research opportunities and higher quality resources due to sanctuary prohibitions	**O**	**+** Same as proposed action	**+** Same as proposed action	NA
Offshore Energy Development	**~** Prohibition of oil and gas development is not significant due to no existing or planned facilities; minor adverse effects on alternative energy due to compliance with sanctuary regulations	**O**	**~** Same as proposed action regarding oil and gas development; greater adverse impacts on alternative energy due to absence of authorization process to allow facilities that alter the seabed or have discharges.	**~** Same as proposed action	NA

Key to symbols:

O = No Impact
~ = Less Than Significant Adverse Impact
– = Significant Adverse Impact (Note: no alternative would result in that level of impact)
+ = Beneficial Impact
NA = Not Applicable

Table ES-1. Summary of Potential Resource Impacts					
Resource	**Proposed Action**	**No Action Alternative**	**Existing Regulations**	**Arena Cove Boundary Alternative**	**MPWC Zones Alternative**
Marine Transportation	~ Due to discharge and introduced species prohibitions	O	~ Slightly higher level of adverse impact than proposed action due to no exception for clean graywater discharges.	~ Similar to proposed action. Very minor increase in adverse impact due to application of discharge and other regulations to the cove.	NA
Homeland Security and Military Uses	~ Due to discharge and introduced species prohibitions	O	~ Slightly higher level of adverse impact than proposed action due to no exception for clean graywater discharges.	O	NA

*The impacts across all regulations for all regulatory alternatives in Socioeconomics are not expected to rise to the level that any negative impacts would occur. It is most likely there would be small positive impacts.

Key to symbols:

O = No Impact
~ = Less Than Significant Adverse Impact
– = Significant Adverse Impact (Note: no alternative would result in that level of impact)
+ = Beneficial Impact
NA = Not Applicable

Chapter 1

BACKGROUND

This Draft Environmental Impact Statement (DEIS) is an evaluation of the potential environmental impacts of expanding the boundaries of Cordell Bank and Gulf of the Farallones national marine sanctuaries and establishing regulations for the management of the expanded sanctuaries. This DEIS also evaluates proposed regulatory changes that would apply to existing sanctuary boundaries. NOAA is considering expansion of CBNMS and GFNMS to an area north of the existing sanctuaries that extends from Bodega Bay in Sonoma County, to just south of Alder Creek in Mendocino County, and west beyond the continental shelf.

Volumes 2 and 3 contain the draft management plans (DMP) for each sanctuary. These DMPs include information about the sanctuaries' environment and resources, regulations and boundaries, staffing and administration, priority management issues, and actions proposed to address them over the next five years. The proposed action and several alternative actions are described in Chapter 3 of this DEIS. The National Oceanic and Atmospheric Administration's (NOAA) Office of National Marine Sanctuaries (ONMS) is the lead agency for this proposed project.

This DEIS has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969 (42 United States Code (U.S.C.) § 4321 et seq.,) and its implementing regulations (40 Code of Federal Regulations (CFR) Parts 1500-1508). This DEIS presents to the decision makers and the public information required to understand the potential environmental consequences of the proposed action and alternatives.

This chapter provides background information on the Office of National Marine Sanctuaries (ONMS) and the authorities for establishing, expanding and managing the sanctuaries.

1.1 Statutory Authorities – National Marine Sanctuaries Act

The National Marine Sanctuaries Act (NMSA) of 1972, as amended (16 U.S.C. 1431 et. seq.) is the legislative mandate governing the ONMS. The NMSA authorizes the Secretary of Commerce to designate as national marine sanctuaries areas of the marine environment with special national significance due to their conservation, recreational, ecological, historical, scientific, cultural, archeological, educational or aesthetic qualities. Among the purposes and policies of the NMSA are the mandates 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 (16 U.S.C. 1431 (b)(1));

- 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 (16 U.S.C. 1431 (b)(2));
- 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)); and
- 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, and other public and private interests concerned with the continuing health of these areas (16 U.S.C. 1431 (b)(7)).

The expansion of CBNMS and GFNMS boundaries is consistent with and would further these purposes and policies, and would more comprehensively provide for coordinated conservation and management of these areas of special national significance and the resources within them.

1.2 The Office of National Marine Sanctuaries

The National Oceanic and Atmospheric Administration (NOAA) is charged with managing marine protected areas as the National Marine Sanctuary System (16 U.S.C. 1431 (b)(1)). The Office of National Marine Sanctuaries (ONMS) is the federal program within NOAA that manages the National Marine Sanctuary System. The mission of the ONMS is to identify, protect, conserve, and enhance the natural and cultural resources, values, and qualities of the National Marine Sanctuary System for this and future generations throughout the nation. The ONMS serves as the trustee for a network of 14 marine protected areas. The National Marine Sanctuary System encompasses more than 170,000 sq miles of marine and Great Lakes waters from Washington State to the Florida Keys and from New England to American Samoa (Figure 1.2-1). Within their protected waters, giant whales feed, breed and nurse their young, coral colonies flourish, and shipwrecks tell stories of our maritime history. Sanctuary habitats include beautiful rocky reefs, lush kelp forests, whale migration corridors and destinations, spectacular deep-sea canyons, and underwater archaeological sites. Areas managed by the ONMS range in size from one sq mile in the Monitor National Marine Sanctuary offshore of North Carolina to 13,581 sq miles in the National Marine Sanctuary of American Samoa and 140,000 sq miles in the Papahanāumokuākea Marine National Monument in the Northwestern Hawaiian Islands, which NOAA manages along with the U.S. Fish and Wildlife Service and the State of Hawaii under the Antiquities Act. Each national marine sanctuary or marine national monument is a unique place deserving of special protection. National marine sanctuaries serve as natural classrooms, cherished recreational spots and places for valuable commercial activities. They represent many things to many people and are part of our nation's legacy to future generations.

The National Marine Protected Areas (MPA) Center, established under Executive Order 13158 (May 2000), is a division of ONMS, with a mission to facilitate the effective use of science, technology, training, and information in the planning, management, and evaluation of the nation's system of MPAs. The MPA Center works in partnership with federal, state, tribal, and local governments and stakeholders to build a science-based, comprehensive national system of MPAs, and to support and enhance existing MPA programs across all levels of government.

Figure 1.2-1. The National Marine Sanctuaries System

The ONMS raises public awareness of sanctuary resources and conservation issues through programs of scientific research, monitoring, exploration, education and outreach. The ONMS provides oversight and coordination of the National Marine Sanctuary System by setting priorities for addressing resource management issues and directing program and policy development. To protect the living marine and non-living resources of sanctuaries, the ONMS works cooperatively with the public developing management plans for MPAs within the National Marine Sanctuary System consistent with the NMSA.

1.3 National Marine Sanctuaries as Marine Protected Areas

National marine sanctuaries, including CBNMS and GFNMS, are marine protected areas (MPAs). Executive Order No. 13158 (May 26, 2000, 65 F.R. 34909 Sec. 2. (a)) defines a marine protected area as "…any area of the marine environment that has been reserved by Federal, state, territorial, tribal, or local laws or regulations to provide lasting protection for part or all of the natural and cultural resources therein." MPAs are geographical areas "where natural and/or cultural resources are given greater protection than the surrounding waters (E.O. 13158, 2000)."[3] An MPA can be located in the open ocean, coastal areas, intertidal zones, estuaries, or protected areas of the Great Lakes. There are two other national marine sanctuaries off the California coast, Monterey Bay National Marine Sanctuary (MBNMS) and Channel Islands National Marine Sanctuary. A few illustrative examples of other types of California coastal marine protected areas managed by different management agencies, include Point Reyes National Seashore, Tijuana River National Estuarine Research Reserve, Point Arena State Marine Reserve, Southeast Farallon Island Marine Conservation Area, and Salmon Creek Coast Area of Special Biological Significance.

1.4 Comprehensive Management of the National Marine Sanctuary System

The NMSA includes a finding by Congress that the ONMS will "maintain for future generations the habitat and ecological services of the natural assemblage of living resources that inhabit [sanctuaries]" (16 U.S.C. 1431 (a)(4)(A),(C). The NMSA further recognizes 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 special areas

[3] http://marineprotectedareas.noaa.gov/aboutmpas/definition

of the marine environment" (16 U.S.C. 1431 (a) (3)). Accordingly, the ONMS applies a broad and comprehensive management approach to meet the NMSA's primary objective of resource protection (16 U.S.C. 1431 (b)(6)).

This comprehensive management approach serves as a framework for addressing long-term protection of a wide range of living and nonliving marine resources, while allowing multiple uses of the sanctuary to the extent that they are compatible with the primary goal of resource protection. The resources managed by the ONMS span diverse geographic, administrative, political and economic boundaries. Strong partnerships among resource management agencies, the scientific community, stakeholders and the public at-large are needed to realize the coordination and program integration that the NMSA calls for in order to comprehensively manage national marine sanctuaries.

1.5 CBNMS and GFNMS Management

Management of CBNMS and GFNMS are described below. As part of the expansion of these two national marine sanctuaries, NOAA would revise the management plans, regulations, and terms of designation for each site.

CBNMS

CBNMS was designated in 1989 to protect 529 sq miles (399 sq nm) around Cordell Bank, an underwater bank that rises from the seafloor to within 115 feet of the surface. CBNMS is located west and south of the Point Reyes peninsula, north of San Francisco, California and GFNMS. Its boundaries are contiguous with a portion of the GFNMS boundaries. CBNMS protects the undersea ridges and pinnacles of Cordell Bank and soft bottom areas surrounding the bank. CBNMS waters and habitats also serve as a biological hotspot and support a diverse community of life.

The management plan for CBNMS was updated in 2008, as part of the joint management plan review process. CBNMS and GFNMS managers work together under the framework of their management plans to coordinate cooperative management of the sanctuaries where appropriate, and also work with MBNMS management and a variety of other resource management entities and community partners in the region. Ecosystem protection and allowing human uses compatible with that purpose are major components of the CBNMS management plan. Key ecosystem protection issues include improving understanding of impacts from human uses and adopting management strategies to address the impacts in and around sanctuary waters, such as acoustic impacts and strikes of whales from ships; communication with fishery management authorities; and addressing marine debris. The plan also covers partnerships with community groups, education and outreach, and conservation science.

The sanctuary advisory council for CBNMS is a community-based body which regularly meets to provide advice to CBNMS management. The administrative office for CBNMS is located at the Point Reyes National Seashore headquarters in Point Reyes Station, California, and there is a display about the sanctuary at the National Seashore's Visitor Center. In May 2013, the Oakland Museum of California opened a renovated science wing that dedicated an extensive exhibit focused on the rich and productive marine ecosystem protected by CBNMS. Also, the Cordell Marine Sanctuary Association is an organization dedicated to supporting CBNMS, including supporting CBNMS research and education efforts, partnerships, and increasing public awareness about CBNMS and its programs.

GFNMS

Designated in 1981**,** GFNMS spans 1,282 sq miles (966 sq nm) west and north of the San Francisco peninsula in California, and surrounds the Farallon Islands. GFNMS protects open ocean, nearshore tidal flats, rocky intertidal areas, estuarine wetlands, subtidal reefs**,** and coastal beaches within its boundaries. GFNMS waters and habitats support a diverse community of marine life above and below the surface, located in one of the most biologically productive regions in the world. In addition, GFNMS has administrative jurisdiction over the northern portion of Monterey Bay National Marine Sanctuary (MBNMS), from the San Mateo/Santa Cruz County line northward to the existing boundary between the two sanctuaries, which are contiguous. MBNMS remains the lead for water quality issues in this area.

GFNMS updated its management plan in 2008, as part of a joint management plan review process that included CBNMS and MBNMS. The GFNMS management plan offers a vision and course for protecting the rich marine ecosystems of ocean and coastal waters off north-central California while continuing to allow compatible, sustainable human uses. The result of more than seven years of study, planning and extensive public input, the management plan addresses key issues including ecosystem protection, wildlife disturbance, vessel traffic, water quality, non-native species, maritime heritage, conservation science, and education and outreach.

Sanctuary management receives advice from a sanctuary advisory council, a body of representatives of community constituencies that meets regularly. GFNMS maintains an administrative office and Visitor Center on Crissy Field in the Presidio of San Francisco. GFNMS also relies on an extensive network of volunteers to assist in data collection and outreach to the public. There is an active cooperating association, Farallones Marine Sanctuary Association, that supports and partners closely with GFNMS management on habitat restoration, science, volunteer, education and community awareness projects in the sanctuary.

1.6 Project Location and Background

Figure 1.6-1 shows the regional location of the proposed expansion area, including the existing and proposed sanctuary boundaries and surrounding area. The proposed GFNMS expansion area covers the offshore coastal area from Bodega Bay in Sonoma County to a point just south of Alder Creek in Mendocino County. The proposed CBNMS expansion area includes area to the north and west of the existing sanctuary, offshore Marin County.

In 2001, NOAA received public comment during joint management plan review scoping meetings requesting that CBNMS and GFNMS be expanded north and west. In response, the revised sanctuary management plans completed in 2008 include strategies to facilitate a public process to ensure that current boundaries are inclusive of the area's natural resource and ecological qualities, including the biogeographic representation of the area. These strategies include GFNMS Resource Protection Action Plan, Strategy RP-9 and CBNMS Administration Action Plan, Strategy AD-10.

Beginning in 2004, then Congresswoman Lynn Woolsey, joined later by Senator Barbara Boxer, repeatedly introduced legislation to expand both of these national marine sanctuaries but was never passed by Congress. Congressional, public, and NOAA interest in expanding CBNMS and GFNMS stemmed from a desire to protect the biologically productive underwater habitat and important upwelling center that is the source of nutrient rich waters (see Chapter 2, Purpose and Need).

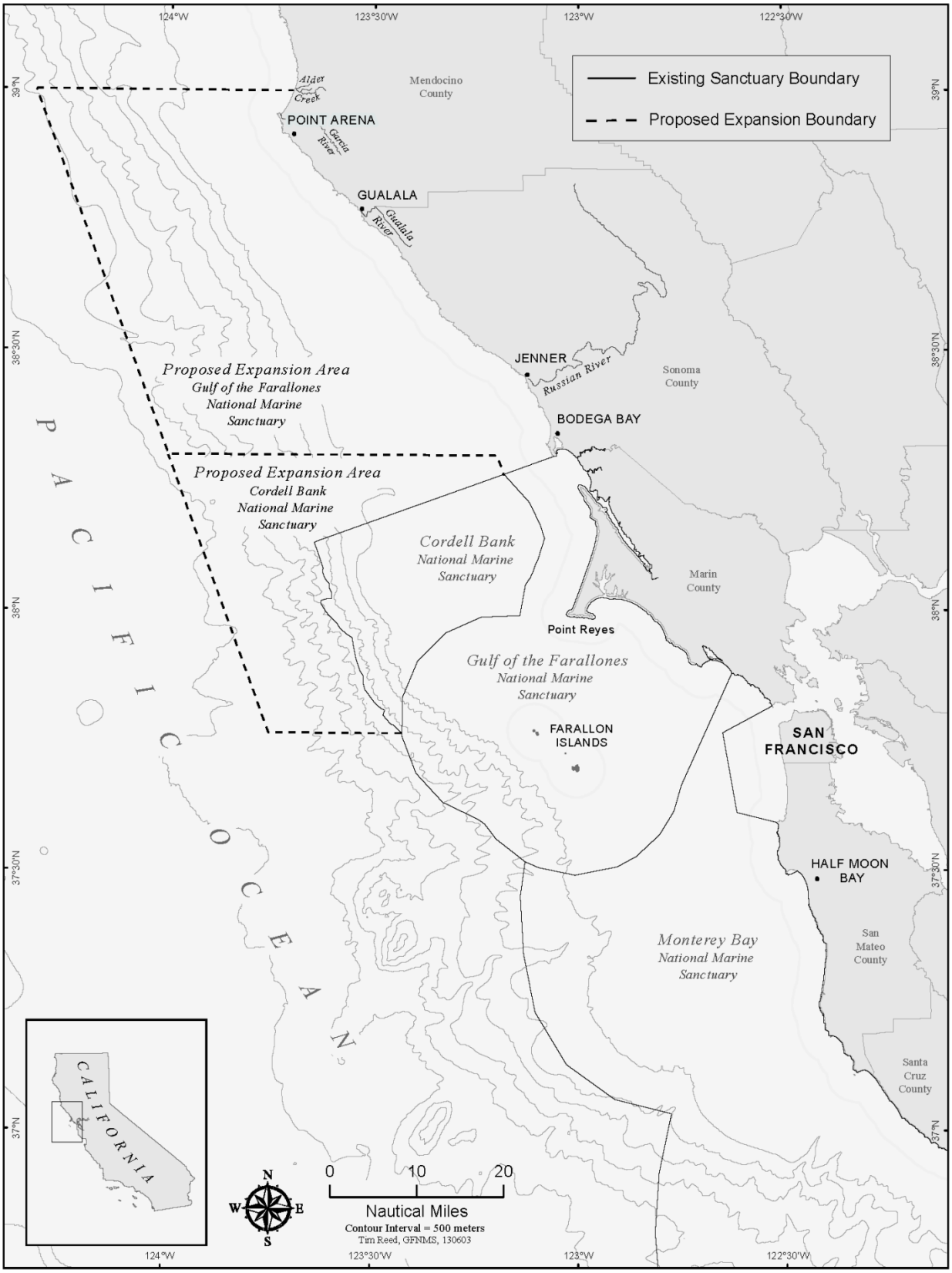

Figure 1.6-1. Regional Location of Proposed Expansion Area

In accordance with Section 304(e) of the NMSA, NOAA is now initiating a review of the boundaries for CBNMS and GFNMS to evaluate and assess a proposed expansion of the sanctuaries. In doing so, NOAA is considering extending, and as necessary amending, the regulations and management plan for CBNMS and GFNMS to this area. During the development of this action, it became clear that a wholesale extension of GFNMS and CBNMS regulations to the respective expansion areas would not be the most judicious approach in order to meet the goals of providing resource protection and allowing compatible uses. Therefore, NOAA is proposing to extend some of the regulations unchanged to the expansion area, amend some of the existing regulations, and add some new regulations. This proposed action would protect the upwelling source waters of the sanctuaries as well as nationally significant seascapes, wildlife, and shipwrecks, and would promote ecotourism. Additional information on the background of the proposed action is available at http://farallones.noaa.gov/manage/expansion_cbgf.html.

1.7 Public Involvement

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]). The following section outlines public involvement in the proposed sanctuary expansion review process.

Scoping

One aspect of public involvement is the scoping process. Public involvement begins with a notice of intent (NOI) to prepare an environmental impact statement, which announces public scoping meetings. Public involvement extends to any NEPA-related public hearings or meetings (40 CFR § 1506.6[b]). Soliciting public comment begins when the NOI is published in the Federal Register and continues through the preparation of the EIS.

On December 21, 2012, NOAA published an NOI in the Federal Register, which notified the public of the proposed action, announced the three public scoping meetings, and solicited public comments. ONMS held public scoping meetings in Bodega Bay on January 24, 2013, Point Arena on February 12, 2013 and Gualala on February 13, 2013. Several hundred people participated in these meetings and provided input on specific issues to be analyzed or addressed as part of the environmental analysis for the proposed expansion of the sanctuary boundaries.

In addition to public scoping meetings, ONMS accepted written comments from December 21, 2012 to March 1, 2013. Comments were provided in the form of e-mails, letters, faxes, and electronic submissions on http://www.regulations.gov. During the comment period, the agency received over 300 comments; four of these submissions were compilations of comments provided at scoping meetings and a workshop. A website http://farallones.noaa.gov/manage/expansion_cbgf.html was launched to serve as a central location of project information while the EIS is being developed. The web site provides a link http://www.regulations.gov/#!docketDetail;D=NOAA-NOS-2012-0228 to access all of the scoping comments received on the project, including oral comments made during the scoping meetings. In addition to formal scoping, both sanctuary advisory councils were briefed to provide an opportunity to identify issues for analysis in the EIS. ONMS analyzed all of the scoping comments; to the extent that comments raised issues that are relevant to potential impacts from the proposed expansion, these issues are addressed in the EIS.

Public Review of the Draft EIS

The next step of public involvement is to ensure wide circulation of the DEIS and to solicit public comments on this document. A public review period of at least 60 days follows publication of the DEIS. Availability of the DEIS was announced in the Federal Register, on various e-mail lists, on the project website, and in local newspapers. In addition, copies of the DEIS are available for review in numerous locations, such as libraries, throughout the study area (locations will be published with notice of availability in local newspapers). Public hearings will be held no sooner than 30 days after the notice is published in the Federal Register.

During the public comment period, oral and written comments are anticipated from federal, state, and local agencies and officials, from organizations, and from interested individuals. After the public comment period is over, the comments will be reviewed. A summary of these comments and the corresponding responses from the agency will be included in the Final EIS. If necessary, changes will be made to the EIS as well as the proposed rule and draft management plans as a result of the public comments.

If NOAA moves forward with a final action, it will issue a Final EIS, after which a 30-day mandatory waiting period will occur, and then NOAA may issue its record of decision (ROD). In addition, a final rule that promulgates changes to the regulations and terms of designation of the sanctuaries would be published in the Federal Register.

1.8 Organization of EIS

Chapter 1 is a background discussion of the statutory authorities, the Office of National Marine Sanctuaries, summary of existing CBNMS and GFNMS management, and overview of the public involvement process for the proposed action.

Chapter 2 (Purpose and Need) provides the reasoning behind the proposed action and a summary of the scope of the EIS and decisions to be made on the proposed action.

Chapter 3 (Description of the Proposed Action and Alternatives) describes the proposed boundaries of both sanctuaries and the proposed regulations to be implemented within the existing and expanded sanctuary boundaries. This chapter also includes a description of the alternatives screening process, several alternatives to the proposed action, the No Action alternative, and alternatives identified but removed from consideration.

Chapter 4 (Affected Environment and Environmental Consequences) is a description of the existing conditions in the study area to provide a baseline for assessing environmental impacts that may occur. The chapter includes an evaluation of potential impacts on 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, long-term, and cumulative impacts are evaluated. A separate alternatives comparison section is provided at the end of the chapter.

Chapter 5 (References) provides references for each section of the EIS.

The Appendices include an index, revised terms of designation, report preparers, agencies consulted, distribution list, and biological resources species lists.

Chapter 2

PURPOSE OF AND NEED FOR ACTION

The purpose and need for the action are based on statutory requirements and the ecological importance of maintaining, protecting and enhancing CBNMS and GFNMS marine resources and habitats, which are demonstrated to be of special national significance.

2.1 Purpose of Action

The purpose of this action, expansion of CBNMS and GFNMS to an area north and west of their current boundaries (Figure 1.6-1), is to increase protection of the environment. This expansion would add to the National Marine Sanctuary System a globally significant coastal upwelling center originating off Point Arena and flowing into GFNMS and CBNMS via wind driven currents. The proposed action would also carry over existing regulations into the expansion area, amend current regulations for GFNMS and CBNMS, and add new regulations. Together these regulatory changes would provide for comprehensive management and protection of the resources of the area encompassed by the current sanctuaries and the expansion area.

Expansion of CBNMS and GFNMS to this area would protect one of the most consistent and intense coastal upwelling centers in all of North America and the spectacular marine ecosystem along the southern Mendocino and Sonoma Coast. Because of effects related to coastal topography and ocean circulation, upwelling at Point Arena is concentrated into a strong center or 'cell' distinctly different from upwelling along the California Current. The Point Arena upwelling center is largely separate from upwelling to the north and strongly linked with areas to the south; analysis of ocean currents, water properties, and chlorophyll show a strong association between water upwelled at Point Arena and coastal water masses off southern Mendocino, Sonoma and Marin Counties (Halle and Largier 2011). Upwelling currents at Point Arena carry nutrients to the surface, where the prevailing wind driven surface currents then transport the nutrient filled waters south along the Mendocino and Sonoma coast to the waters over Cordell Bank and around the Farallon Islands. These nutrients are the foundation of the food rich environment in the study area, CBNMS and GFNMS, and promote the growth of organisms at all levels of the marine food web. The nutrients flowing from this upwelling center form the basis of support for a range of species, from plankton to predators. Cordell Bank is densely covered with invertebrates, and has hundreds of species of fish, seabirds and marine mammals in the ocean waters above and around it.

Bodega Canyon is a prominent submarine feature in close proximity to Cordell Bank. This seafloor feature cuts across the continental shelf and slope 2.5 to 5 nm (2.3-5.7 miles) north of Cordell Bank. Submarine canyons provide areas of high bathymetric complexity, support deep water communities, and effect local and regional circulation patterns. Bodega Canyon provides habitat for adult stages of groundfish including rockfish and flatfish that rear in nearshore waters and move offshore in their adult stages. In addi-

tion, offshore canyons and other bathymetric features are important foraging areas for seabirds and marine mammals (Yen et al. 2004). Bodega Canyon has a direct ecological link with CBNMS. It is well documented along that biological productivity along the west coast is enhanced in areas down current from submarine canyons (Pereyra et al. 1969). Each night, krill and other organisms migrate from the canyon edge into the upper layers of the water column. Prevailing currents carry these zooplankton to the south over the continental shelf and away from the canyon during the night. At first light when the krill descend, instead of returning to the canyon, they are trapped on the continental shelf where they are vulnerable to shelf dwelling predators (Chess et al. 1988). This vertical migration of zooplankton out of Bodega Canyon every night provides a constant supply of food for a variety of predators within CBNMS. Krill is an important link in the Cordell Bank food web and primary prey for blue whales, humpback whales, rockfishes and seabirds.

The Farallon Islands are significant sites for resting and breeding marine mammals and seabirds, and their surrounding waters contain one of the largest concentrations of adult white sharks, as well as many fish and invertebrate species. Thick forests of bull kelp create a thriving nearshore ecosystem along the southern Mendocino and Sonoma coast. When upwelling winds relax, surface currents flow to the north and provide nutrients and food from the south for kelp bed inhabitants. Offshore waters of the study area support large populations of krill, which are keystone species and form the basis of a productive marine food web.

The proposed action would connect key geographic components of the Point Arena upwelling system, extending sanctuary boundaries from the source waters of the nutrient-based food web to existing areas of high biological productivity around the Farallon Islands and Cordell Bank. In addition, the thriving marine ecosystems along and offshore of southern Mendocino and Sonoma Counties would receive sanctuary protection.

In addition to protecting living marine resources and their habitats, expansion of the sanctuaries would protect nationally significant seascapes and recreational and commercial uses, including fisheries, in the area.

Furthermore, the proposed action would protect significant submerged cultural resources and historical properties, as defined by the National Historic Preservation Act and its regulations. There are several existing state and federal laws that provide some degree of protection of historical resources, but the State of California regulations only extend 3 nm offshore and existing federal regulations do not provide comprehensive protection of these resources. Records document over 200 vessel and aircraft losses between 1820 and 1961 along California's north-central coast from Bodega Head north to Point Arena. Submerged archaeological remnants likely exist in the area. While there is no documentation of submerged Native American human settlements in the proposed boundary expansion area, some may exist there, since Coast Miwok and Pomo peoples have lived and harvested the resources of this abundant marine landscape for thousands of years. Sea level rise at the end of the last great Ice Age inundated a large area that was likely used by these peoples when it was dry land.

Expansion of the sanctuaries would require revision of each site's terms of designation and sanctuary regulations to cover the resources within the proposed area, benefitting current and future generations. In addition, CBNMS and GFNMS management plans would be revised and their programs would be extended to the area, covering resource protection, sustainable uses, research, and education.

2.2 Need for Action

The proposed expansion area's nutrient-rich waters from the Point Arena coastal upwelling (shown in Figure 4.3-1 in Section 4.3 [Biological Resources]) and the waters south to CBNMS and GFNMS are integral parts of the overall marine ecosystem for these sanctuaries but are currently outside the sanctuaries' boundaries. The upwelled water that emanates from Point Arena is the regional ecosystem driver for productivity in coastal waters of north central California. The source waters of CBNMS and GFNMS, and the study area are not afforded the needed level of protection, management actions and programs that national marine sanctuaries provide. Including this area within CBNMS and GFNMS is critical to help conserve and protect resources by preventing or reducing human-caused impacts such as marine pollution and seabed disturbance, which have the potential to impact the proposed expansion area as well as downstream areas. The biological communities of these national marine sanctuaries are susceptible to damage from these and other select human activities. Additional protection is needed for the food-rich water flowing south from the Point Arena area that supports a marine food web made up of many species of algae, invertebrates, fish, seabirds, and marine mammals. Some species are transitory, travelling hundreds or thousands of miles to the region, such as endangered blue whales, albatross, shearwaters, king salmon, white and salmon sharks, while others live year round in the sanctuaries, such as Dungeness crab, sponges, other benthic invertebrates and many species of rockfish. Of note, the largest assemblage of breeding seabirds in the contiguous United States is at the Farallon Islands, and each year their breeding success depends on a healthy and productive marine ecosystem so nesting adults and fledgling young can feed and flourish.

Purposes and policies of the NMSA (16 U.S.C. § 1431[b]) include these important mandates:

- "…to provide authority for comprehensive and coordinated conservation and management of these marine areas [national marine sanctuaries], and activities affecting them, in a manner which complements existing regulatory authorities; [and]
- 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…"

Existing laws and policies for the Point Arena upwelling area and south do not provide comprehensive and coordinated conservation and management to protect the resources, and application of the NMSA through the sanctuaries' expansion would provide this needed safeguard while facilitating uses compatible with resource protection. In addition, community members and members of Congress have expressed their desire for and the need to ensure better protection of the sanctuaries' resources.

The NMSA requires periodic review and evaluation of the progress in implementing the management plan and goals for each sanctuary. The management plans and regulations must be revised as necessary to fulfill the purposes and policies of the NMSA (16 U.S.C. 1434(e)) to ensure that each sanctuary continues to best conserve, protect, and enhance their nationally significant living and cultural resources.

Since 2003, sanctuary advisory councils from both sites have regularly discussed expansion northward of the sanctuaries and have expressed support for boundary expansion when proposed by local congressional members Representative Lynn Woolsey and Senator Barbara Boxer. At times during review of the proposed

expansion legislation, NOAA expressed support for the expansion, including the boundary option the legislation proposed.

In 2008, the joint management plan review for CBNMS and GFNMS included strategies for the managers of these sanctuaries to facilitate a public process within five years to evaluate boundary alternatives that ensured maintenance of the area's natural ecosystem, including its contribution to biological productivity. The aim was to ensure the sanctuaries' boundaries were inclusive of the area's natural resource, ecological qualities, and biogeographic representation of the area. Accordingly, NOAA initiated the public process to evaluate this action in December 2012.

2.3 Scope of EIS

NEPA requires federal agencies to prepare an environmental document to thoroughly assess the environmental impacts of major federal actions that could significantly affect the environment. The proposed expansion of CBNMS and GFNMS and the associated regulatory changes that would apply in the expansion area have been specifically developed to facilitate improved management and protection of identified priority resources. Therefore, incorporation of the area into the sanctuaries is intended to protect resources and generally reduce impacts of human activities on the environment. Even so, it is necessary to fully disclose and document the potential adverse and beneficial environmental effects of the proposed regulatory actions in a public process, consistent with NEPA and Council on Environmental Quality (CEQ) regulations implementing NEPA.

Additionally, Section 304(a)(4) of the NMSA requires that "terms of designation may be modified only by the same procedures by which the original designation is made." When CBNMS and GFNMS were under consideration for establishment under the NMSA, EISs were prepared prior to their designations as required by the NMSA. As such, since the proposed action would modify the sanctuaries' terms of designation, the NMSA requires preparation of an EIS regardless of the significance of the impacts of the alteration.

This EIS evaluates the environmental impacts associated with expansion of both CBNMS and GFNMS, as well as modification of existing sanctuary regulations within the current GFNMS and CBNMS boundaries. Alternatives to the proposed action consist of slight variations in the proposed regulations and several localized boundary options. Specific boundary and regulatory changes contained within the proposed action and alternatives are described in detail in Chapter 3 of this EIS and are analyzed in terms of impacts in Chapter 4 of this EIS. Application of sanctuary regulations to the expanded area would result in either no effect or beneficial effects in most issue areas. This EIS focuses on the regulatory changes that could affect the environment. Since the proposed action includes modifications to existing sanctuary regulations, there are implications for the existing sanctuaries as well that are evaluated in Chapter 4 of this EIS.

Finally, this EIS presents proposed changes to each sanctuary's terms of designation (see Appendix D). As described in Section 2.2, in order to expand the sanctuary boundaries and implement the proposed regulations, ONMS would need to modify each sanctuary's terms of designation describing the new boundaries and the particular types of activities subject to sanctuary regulation.

This EIS is not an analysis of all activities set forth in the proposed sanctuary management plans. The bulk of the management plans is an extension of the management plans that have been in place since 2008 for

GFNMS and CBNMS. The management strategies and actions that sanctuary staff and their partners will use to address priority issues in the expansion area include targeted research, monitoring, education, outreach, coordination, and resource protection activities. Implementation of the proposed actions within the management plans, individually and cumulatively, would have no significant adverse impact on the environment. See Chapter 3 and 4 for additional details on the management plans.

It is important to note several other related processes that affect the scope of this EIS:

- The proposed action does not involve changes to sanctuary permit procedures, although it would add authorization authority to sanctuary regulations. A separate nationwide regulatory review process is underway to consolidate sanctuary permit regulations.

- NOAA is currently developing a programmatic NEPA analysis for West Coast regional field operations, many of which are designed to implement activities described in management plans that have the potential to affect the environment. The vast majority of activities presented in the draft CBNMS and GFNMS management plans would not have an impact on the environment because they are administrative in nature. In addition, the draft management plans describe strategies that could result in activities such as: vessel operations, ship operations, aircraft operations, non-motorized craft, SCUBA or snorkel operations, onshore fieldwork, deployment of autonomous underwater vehicles or remotely operated vehicles, deployment of remote sensing equipment, deployment of buoys, sampling protocols, facilities construction or onshore signage. However, the strategies laid out in the draft management plans are not detailed enough at this time to determine what specific field operations would be needed to implement them. As a result, operational decisions regarding field operations are not ripe for decision and therefore, are not ready to undergo a full analysis under NEPA at this time. Any potential impacts of those field operations would be considered in a separate NEPA action at the time that NOAA has determined what specific activities would need to be considered. For example, some field operations may be analyzed under the programmatic West Coast regional field operations NEPA analysis, or in a supplement to that analysis, or any construction of facilities or onshore signage may be analyzed in a separate facilities-related NEPA analysis.

- NOAA is currently working on a proposal to regulate introduced species in both the State and federal waters of GFNMS and MBNMS. As part of this separate rulemaking, the regulations for the GFNMS would contain a minor modification to the wording regarding exceptions for introduced species.

- A separate nationwide regulatory review process is currently underway in NOAA to consolidate some definitions of terms that are common across several national marine sanctuaries, which includes potential modifications to the definition of MPWC.

2.4 Decisions to be Made and Agency Coordination

Decisions related to the proposed action include the following:

- Expansion of CBNMS and GFNMS boundaries;
- Proposed changes to the terms of designation for CBNMS and GFNMS;
- Proposed changes to regulations for CBNMS and GFNMS; and
- Revised management plans for CBNMS and GFNMS.

The CEQ defines the rights and responsibilities of cooperating agencies in Section 1501.6 of the CEQ regulations. At the request of the lead agency, any other federal agency that has jurisdiction or that has special expertise with respect to any environmental issue will be a cooperating agency. No federal agencies were formally requested to be cooperating agencies, nor did any federal or state agencies request this status. NOAA is working closely with a variety of pertinent resource agencies on the development of the EIS, the management plans, and the proposed regulations. NOAA has sought the input of numerous federal, state, and local officials and agencies in preparing this DEIS; see Appendix F (Persons and Agencies Consulted).

Chapter 3

DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

This chapter includes a specific description of the components of the proposed action and identifies alternatives. The proposed action includes expansion of the boundaries of both CBNMS and GFNMS, application of existing sanctuary regulations to the expanded boundaries, modification of several existing regulations and corresponding changes to each sanctuary's terms of designation, and updates to each sanctuary management plan. The proposed action represents NOAA's "preferred alternative" (Section 3.2). Also in this section is a description of the alternatives to the proposed action, including the No Action alternative (Section 3.3), a regulatory alternative (Section 3.4), a boundary alternative for Arena Cove (Section 3.5), alternative zones for Motorized Personal Watercraft (MPWC) (Section 3.6) and a description of the alternatives that were initially considered but screened from full EIS analysis (Section 3.7). NOAA has carefully considered state and federal authorities in proposing new regulatory oversight to ensure protection and management of sanctuary resources. Proposed new authorities are intended to complement existing authorities.

Section 2.3 of this EIS describes the scope of the analysis, which is focused on regulatory changes that would apply to the proposed sanctuary expansion area and several proposed changes to existing regulations that would apply to activities within the existing sanctuary boundaries. The focus of this project description is on those components of the proposed regulations that have the potential to result in environmental or socioeconomic effects. The DEIS does not include a detailed assessment of the individual, issue-based action plans that are contained in the sanctuary management plans because they are based on the proposed regulations, which are fully analyzed in this EIS. The action plans within the management plans involve goals, strategies, activities, and planning tools for resource protection and education programs and sanctuary administration and are not anticipated to cause significant physical changes to the environment nor would they allow activities that are currently prohibited in the expansion area. As mentioned in Section 2.3, field operations that would implement the action plans will be analyzed in a regionally based programmatic environmental assessment currently under development. These action plans are described in detail in each sanctuary's draft updated management plan. The full draft management plans have been made available for review and comment with this DEIS.

3.1 Development of Alternatives

As described in Chapter 1, the proposed action is a result of the need to apply additional protection to California's north-central coast environment. In developing the proposed action and alternatives for analysis in this EIS, NOAA considered possible boundary and regulatory changes that would be consistent with achieving increased resource protection and would be appropriate for inclusion in the overall sanctuary

expansion proposal. The following screening criteria were used for determining both the proposed action and a range of reasonable alternatives:

- Alternative must be feasible;
- Alternative must be consistent with the purposes and policies of the NMSA;
- Alternative must be consistent with, and achieve the overall purpose and need, as established in Chapter 2 of this EIS;
- Alternative must be consistent with the purpose and goals of the management plans, which means that it must address resource management issues, generate beneficial environmental effects, and address uses or other activities that have an adverse effect on sanctuary resources;
- Alternative should allow for the incorporation and consideration of recent or best available data and scientific knowledge; and
- Alternative should maximize environmental benefits, while avoiding unnecessary adverse socio-economic impacts.

Alternatives that were initially considered but that did not meet the screening criteria above are listed in Section 3.6, Other Alternatives Considered and Eliminated.

Both boundary and regulatory alternatives were identified by agencies, businesses, non-profit organizations and citizens during the public scoping process. In addition, alternatives were identified and explored by sanctuary staff, based on their scientific, policy and management expertise.

All national marine sanctuaries are governed by NOAA regulations. Within the national marine sanctuary regulations, for each sanctuary, there is a set of individual site regulations that establish the sanctuary boundaries, administrative procedures, definitions, and prohibited activities. In addition, each sanctuary has a management plan that identifies specific programs and action plans for the management of the sanctuary. Therefore, there are several components to define for the proposed sanctuary expansion — boundaries, regulations, terms of designation and management plan actions.

Although each sanctuary has unique issues that are addressed by the site regulations, there are many issues in common between the two sanctuaries. For several issues, the proposed regulation is the same for each sanctuary, but in some cases the proposed regulation may differ between the two sanctuaries due to different conditions, circumstances, needs, and language used at the time of original designation.

The following text describes the proposed and alternative boundaries under consideration, as well as proposed and alternative substantive regulatory changes for each sanctuary. A detailed discussion of the regulatory text is included in the notice of proposed rulemaking concurrently published in the Federal Register.

3.2 Proposed Action

The proposed action represents the preferred alternative and involves expanding both GFNMS and CBNMS boundaries, as well as applying a set of sanctuary regulations that have been tailored for more targeted

protection of the area's resources. Some of the GFNMS and CBNMS regulations would be extended to the expansion area without changes, some regulations would be altered, and some new regulations would be added in order to best suit the resource protection needs of the expanded sanctuaries. The regulatory changes are described in detail below. Each sanctuary's terms of designation would be modified to reflect the expanded boundaries, and each sanctuary's management plan would be updated.

Boundary Area

The proposed action involves expanding the boundaries of CBNMS and GFNMS to include waters and submerged lands offshore Sonoma, Mendocino and Marin Counties. The overall expansion area would be to the north and west, encompassing waters adjacent to the Sonoma coast and a portion of the Mendocino coast up to a point just south of Alder Creek. The western boundary would be generally aligned with the 1500 fathom depth contour. The northern area would become part of GFNMS. The proposed CBNMS expansion area includes area to the north and west of the existing sanctuary, offshore Marin County. The proposed boundaries are shown in Figure 1.6-1 and described for each sanctuary in the following subsections. The exact boundary coordinates of the expanded sanctuaries have been published in the Federal Register as part of the notice of proposed rulemaking.

Proposed CBNMS Boundary

The expanded area adjacent to, and west and north of, the existing CBNMS would add approximately 757 sq miles (572 sq nm) of offshore ocean waters and the submerged lands under those waters to the existing approximately 528 sq miles (399 sq nm) sanctuary, for a total size of approximately 1286 sq miles (971 sq nm). The CBNMS expansion would take place primarily offshore Marin County, with a small portion of the area to encompass Bodega Canyon offshore of Sonoma County. Starting at the northernmost point of the existing CBNMS boundary, the proposed expanded CBNMS boundary would extend nearly 3 miles (2 nm) northwest to a point approximately 8 miles (6 nm) west of Bodega Head. From that point, the expanded sanctuary boundary would extend west approximately 44 miles (38 nm). It would then extend southeast approximately 39 miles (34 nm). It would then continue east 17 miles (15 nm) to a point where it would intersect the existing CBNMS and GFNMS boundaries. See Figure 1.6-1.

Proposed GFNMS Boundary

The expanded area would be north of the existing GFNMS and would add approximately 2014 sq miles (1521 sq nm) of coastal and ocean waters and submerged lands to the existing 1279 sq miles (966 sq nm) sanctuary, with a total size of 3297 sq miles (2490 sq nm) (including the additional four sq miles of restored wetlands on the Giacomini property).

The expansion area would extend along the Northern California Coast from the southern tip of Bodega Head in Sonoma County northward to the 39th parallel, north of Point Arena and south of Alder Creek in Mendocino County. The landward boundary is the Mean High Water Line (MHWL), except in specific areas. The seaward boundary extends along the continental slope, approximately 34 miles (26 nm) from shore at the northern boundary and approximately 50 miles (38 nm) from shore at the southern boundary. The northern boundary is the 39th parallel, and the southern boundary is where the expansion area meets the (expanded) CBNMS and the existing GFNMS. The expansion area does not include the Salmon Creek Estuary, the Russian River Estuary, the Gualala River Estuary, the Garcia River Estuary or the inner Arena Cove.

A close-up view of the proposed northern boundary near Alder Creek is shown in Figure 3.2-1. The proposed boundary at Arena Cove is shown in Figure 3.2-2 and the boundary at the Russian River is shown in Figure 3.2-3. The boundary at Arena Cove would be at the west end of the wharf (pier).

Proposed Regulations

Since the proposed action includes expansion of both CBNMS and GFNMS, the expansion area would be subject to NOAA regulations (CFR Title 15, Part 922) that apply to national marine sanctuaries (Subparts A, D and E, unless noted otherwise) and to the individual regulations of these two sanctuaries (Subparts K and H, respectively). There are several differences between the regulations of the two sanctuaries. The regulations for both sanctuaries include definitions, prohibited activities and other regulated uses and permit processes and issuance criteria. In order to design the sanctuary regulations for the existing and anticipated uses in both the current sanctuaries and the proposed expansion area, the existing regulations of CBNMS and GFNMS would be slightly modified. The proposed regulations for the two sanctuaries are described below and any substantive differences between existing and proposed regulations are noted. The full text of the proposed regulations is included in the proposed rule, published by NOAA in the Federal Register.

CBNMS

Few changes from existing regulations would occur. The following prohibitions and permit requirements as modified from current regulations would be applied to both the existing sanctuary and the expansion area. Definitions used in the regulations would generally remain the same as current definitions. Regulations that are new or substantially modified from existing regulations are noted with an asterisk (*).

Prohibited Activities

The following activities would be prohibited within the sanctuary (including both existing sanctuary and proposed sanctuary expansion area (15 CFR 922.112, Prohibited or otherwise regulated activities)[1]:

(1) Oil, gas or mineral exploration, development or production.

(2) (i) Discharging or depositing into the sanctuary, other than from a cruise ship, any material except:

- Fish, fish parts, chumming materials or bait, used in lawful fishing;
- For a vessel less than 300 gross registered tons (GRT):
  - clean effluent generated incidental to vessel use and generated by an operable Type I or II marine sanitation device (MSD; U.S. Coast Guard classification); and
  - clean graywater,[2]*
- For a vessel 300 GRT or greater without sufficient tank capacity to hold sewage and/or graywater while within the sanctuary:
  - clean effluent generated incidental to vessel use and generated by an operable Type I or II marine sanitation device (U.S. Coast Guard classification); and
  - clean graywater*;

[1] The order of prohibitions has been modified from the order in the existing regulations.

[2] Graywater is defined in section 312 of the Clean Water Act as galley, bath, and shower water. Clean means not containing detectable levels of harmful matter.

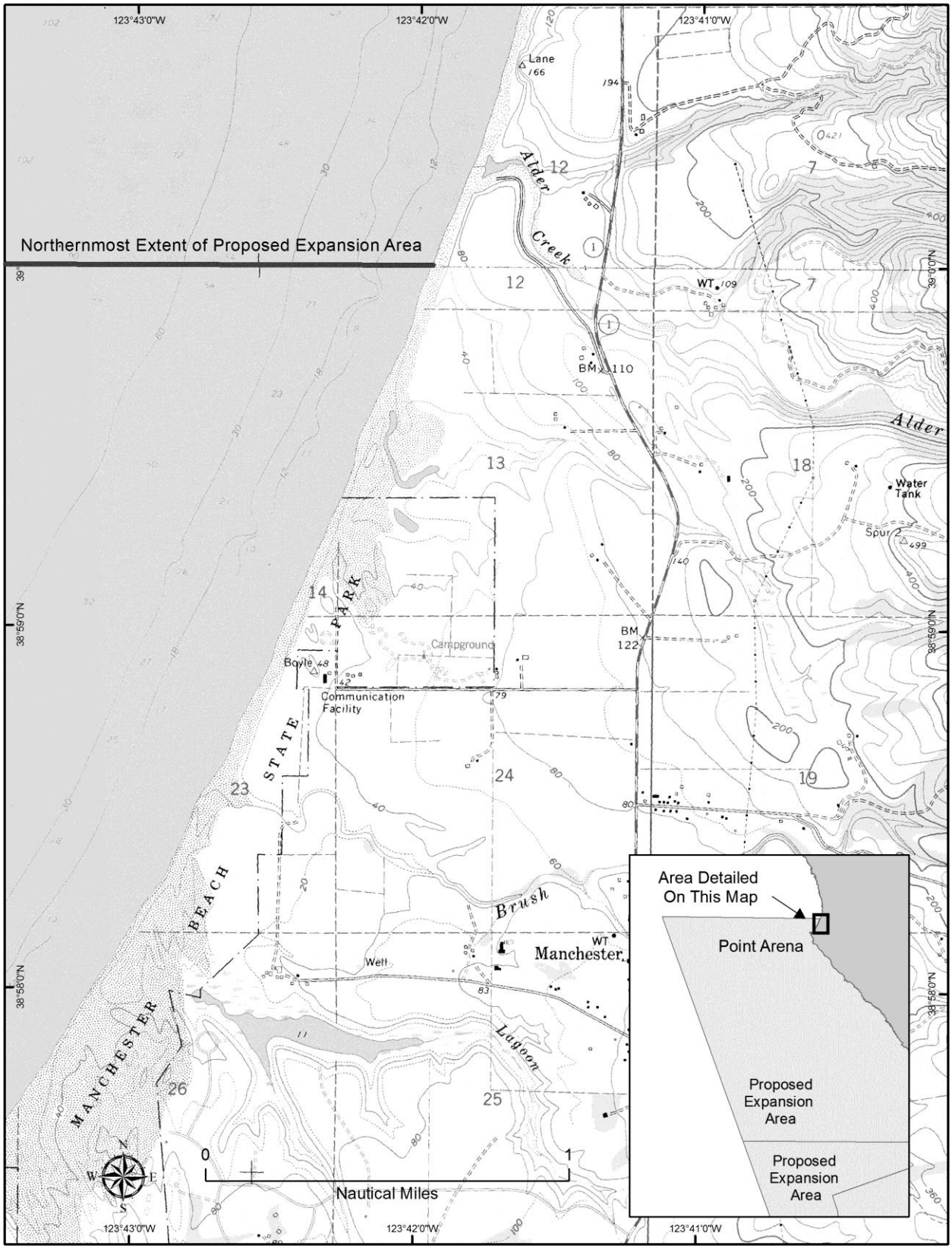

Figure 3.2-1. Northern GFNMS Boundary Detail – Proposed Action

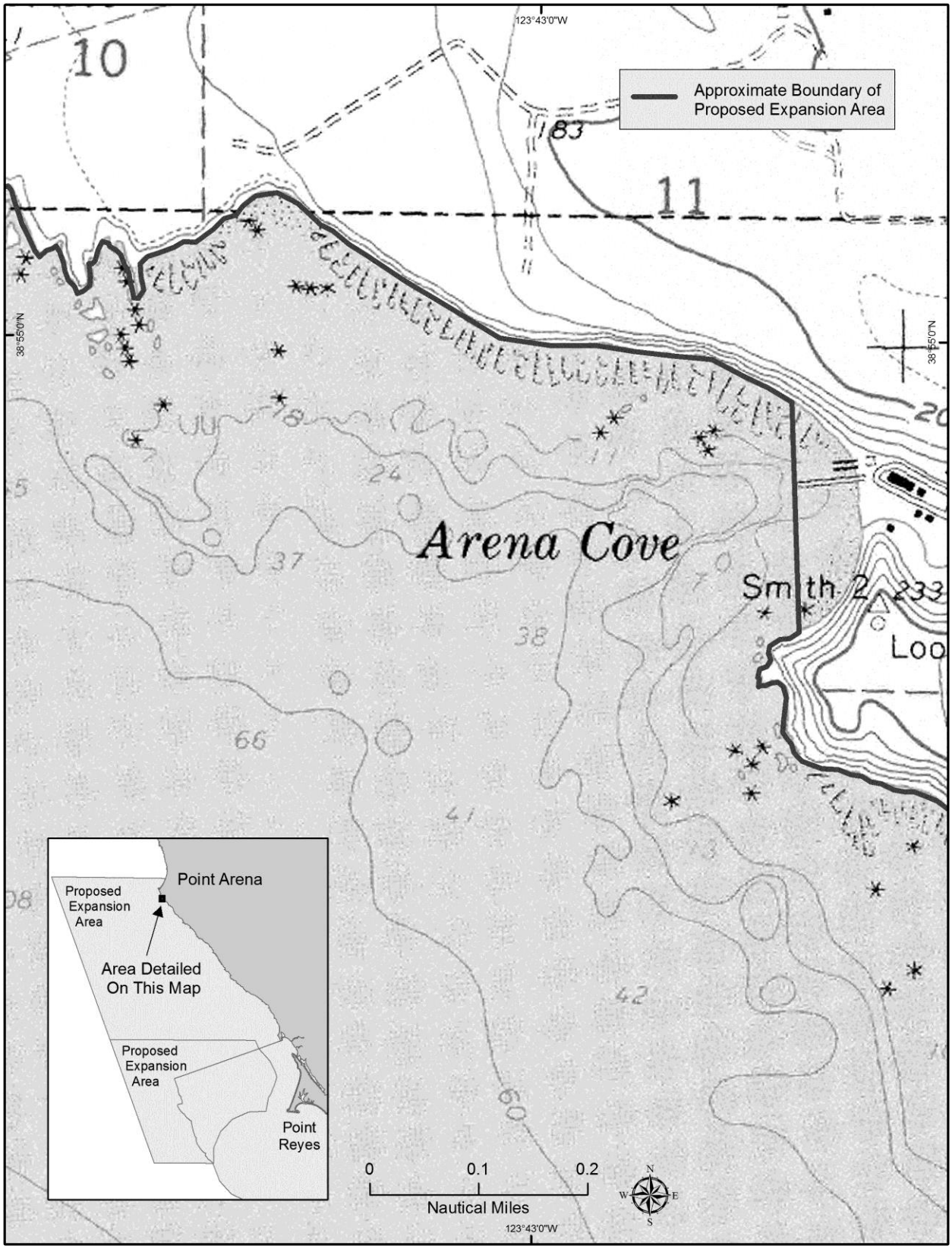

Figure 3.2-2. Arena Cove Harbor Detail – Proposed Action

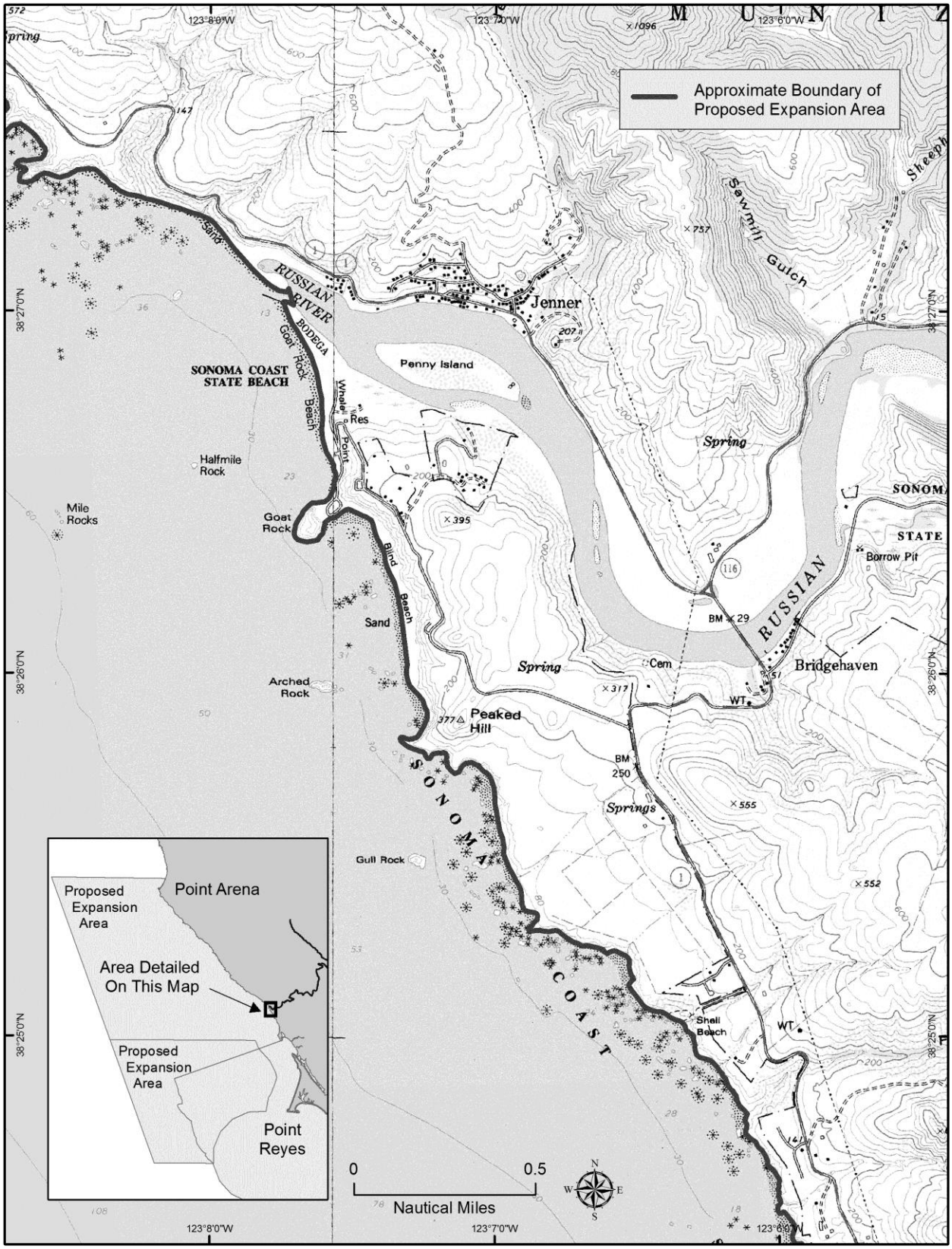

Figure 3.2-3. Russian River Boundary Detail – Proposed Action

- Clean vessel deck wash down, clean vessel engine cooling water, clean vessel generator cooling water, clean bilge water, or anchor wash; or
- Vessel engine or generator exhaust.

(ii) Discharging from a cruise ship except clean vessel engine cooling water, clean vessel generator cooling water, vessel engine or generator exhaust, clean bilge water, or anchor wash.

(iii) Discharging or depositing, from beyond the boundary of the sanctuary, any material that subsequently enters the Sanctuary and injures a sanctuary resource or quality, with the same exceptions as listed above.

(3) Removing, taking, or injuring benthic invertebrates or algae located on or within the line representing the 50-fathom isobath surrounding Cordell Bank. (This prohibition does not apply to use of bottom contact gear used during fishing activities, which is prohibited pursuant to 50 CFR part 660 (Fisheries off West Coast States)).

(4) (i) Drilling into, dredging, or otherwise altering the submerged lands within the line representing the 50-fathom isobath surrounding Cordell Bank; or constructing, placing, or abandoning any structure or material on or in the submerged lands. (This prohibition does not apply to use of bottom contact gear used during fishing activities, which is prohibited pursuant to 50 CFR part 660 (Fisheries off West Coast States)).

(ii) Beyond the line representing the 50-fathom isobath surrounding Cordell Bank, drilling into, dredging, or otherwise altering the submerged lands; or constructing, placing, or abandoning any structure or material on the submerged lands except for anchoring any vessel or lawful use of any fishing gear.

(5) Taking any marine mammal, sea turtle, or bird, except as authorized by existing regulations.

(6) Possessing within the sanctuary any marine mammal, sea turtle or bird taken, except as authorized by existing regulations or as necessary for law enforcement purposes.

(7) Possessing, moving, removing, or injuring a sanctuary historical resource.*

(8) Introducing or otherwise releasing an introduced species, except striped bass (*Morone saxatilis*) released during catch and release fishing activity.

(9) Interfering with an investigation, search, seizure, or disposition of seized property in connection with enforcement of regulations.*

Exceptions and Authorizations

There are proposed exceptions to the above prohibitions, as well as a proposed authorization authority to allow certain activities:

- Exceptions for Emergencies – The above prohibitions do not apply to activities necessary to respond to an emergency threatening life, property or the environment, or as may be permitted by the Sanctuary Superintendent, with authority delegated by the ONMS Director, in accordance with criteria outlined in

15 CFR § 922.48 (National Marine Sanctuary permits-application procedures and issuance criteria) and specifically allowed within the CBNMS permit procedures and criteria 15 CFR § 922.113 (see below).

- Department of Defense – All activities carried out by the Department of Defense (DOD) on the effective date of expansion that are necessary for national defense are exempt from the above prohibitions; other such activities will be exempted after consultation between the Department of Commerce and the DOD. DOD activities not necessary for national defense, such as routine exercises and vessel operations, are subject to all prohibitions contained in the regulations in this subpart.
- Authorizations* – Activities prohibited in (2), (3), (4)(ii), (5), (6) and (7) above may be allowed if:
  - They are authorized by a lease, permit, license, approval, or other authorization issued,[3] by another agency;
  - The Sanctuary Superintendent approves the activity; and
  - The applicant complies with any terms and conditions necessary to protect Sanctuary resources and qualities.
- Under no circumstances would oil, gas or mineral exploration, development or production be allowed under an authorization.
- Where necessary to prevent immediate, serious, and irreversible damage to a Sanctuary resource, any activity may be regulated on an emergency basis for up to 120 days.

Permits

The proposed regulations would extend permit procedures and criteria for issuing permits currently established in the sanctuary to the expansion area. The proposed regulations and permit procedures and criteria for issuing permits are summarized as follows:

- A permit may be issued for activities prohibited above in items (2) through (7), subject to terms and conditions, as deemed appropriate. In addition, the activity must meet one of the following findings:
  - Further research or monitoring related to Sanctuary resources and qualities;
  - Further the educational value the Sanctuary;
  - Further salvage or recovery operations in or near the Sanctuary; or
  - Assist in managing the Sanctuary.
- In deciding whether to issue a permit, the Superintendent must consider such factors as:
  - The applicant is qualified to conduct the proposed activity;
  - The applicant has adequate financial resources available to conduct and complete the proposed activity;

[3] As a consequence of adding authorization to CBNMS and GFNMS, ONMS regulations will be amended to allow authorizations for these two sanctuaries. This amendment will be included in the proposed rule. Issuance of an authorization would undergo a separate NEPA analysis on a case-by-case basis.

- The methods and procedures proposed by the applicant are appropriate to achieve the goals of the proposed activity;
- The proposed activity will be conducted in a manner compatible with the primary objective of protection of Sanctuary resources and qualities;
- The proposed activity will be conducted in a manner compatible with the value of the Sanctuary, 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;
- It is necessary to conduct the proposed activity within the Sanctuary;
- The reasonably expected end value of the proposed activity to the furtherance of Sanctuary goals and purposes outweighs any potential adverse effects on Sanctuary resources and qualities from the conduct of the activity; and
- Any other factors as the Superintendent deems appropriate.

■ In no event may a permit be issued to allow oil, gas or mineral exploration, development or production.*

Summary of CBNMS Modifications Relative to Current Regulations

The proposed regulations summarized above include the following new or modified provisions which would apply to both the existing sanctuary boundaries and the expansion area, under the proposed action:

■ *Enforcement* – A new prohibition would make the following activities illegal: interfering with, obstructing, delaying, or preventing an investigation, search, seizure, or disposition of seized property in connection with enforcement of the Act or any regulation or permit issued under the Act. This measure would aid in enforcement actions.

■ *Graywater Discharges* – A new exception would allow some vessels to discharge clean graywater within the sanctuary. Since the sanctuary would be expanded and the adjacent GFNMS would be expanded, the larger area may make it difficult for some vessels to hold graywater discharges while transiting through the sanctuaries. By allowing this discharge, non-cruise ship vessels would not be forced to hold all graywater and would have the option of discharging clean graywater in the sanctuary, consistent with the existing provisions in MBNMS and state and federal regulations. Since many vessels enter and exit the San Francisco Bay, this exception would avoid the potential situation of concentrating graywater discharges in a small area outside of the sanctuaries near the bay entrance.

■ *Historical resources* – A new prohibition would make the following activities illegal: possessing, moving, removing, or injuring, or attempting to possess, move, remove or injure a Sanctuary historical resource. Since the sanctuary would be considerably larger in size, there may be submerged resources requiring protection.

■ *Permits* – Permit procedures would be modified to clarify that the regulations prohibit in all cases the issuance of National Marine Sanctuary permits for oil, gas and mineral exploration, development, or production.

■ *Authorization of a Permit, Lease from Another Agency* – A provision would be included to allow approval or "authorization" of specified activities under limited conditions. This authorization provision

is similar to that in the existing regulations for MBNMS and five other national marine sanctuaries. This process would allow the Sanctuary Superintendent, with authority delegated from the ONMS Director, to approve or authorize some but not all otherwise prohibited activities permitted or licensed by any federal, State, or local authority of competent jurisdiction in certain instances. The Sanctuary Superintendent may also deny an authorization or condition an approval to protect sanctuary resources. Current CBNMS permit regulations do not allow the authorization of any prohibited activity other than through a different mechanism, the issuance of a general permit, to (1) further research or monitoring related to sanctuary resources and qualities; (2) further the educational value of the sanctuary; (3) further salvage or recovery operations; or (4) assist in managing the sanctuary. This change could have implications for the existing sanctuary, as well as the proposed expansion area. Activities including the discharge, construction, drilling, dredging or other disturbance on submerged land outside of the line representing the 50-fathom isobath around Cordell Bank, taking and possessing a marine mammal, sea turtle, or bird, and possessing historical resources which are currently prohibited in the existing sanctuary may be authorized under this new proposed provision.

The authorization process would establish a mechanism for the sanctuary to potentially allow new activities within the existing sanctuary and the proposed expansion area if they were to be approved by another authorizing entity, such as cables, establishing new dredge disposal sites, or construction of pipelines. However, authorization of any such uses would be subject to terms and conditions deemed necessary to protect sanctuary resources and qualities.

GFNMS

For the proposed action, GFNMS would include similar new provisions listed above for CBNMS, as well as additional modified prohibitions. These regulations would be applied to the entire sanctuary, both existing and expanded boundaries. New or substantially modified regulations are noted with an asterisk (*).

Prohibited Activities

Several of the proposed prohibitions are the same as CBNMS prohibited activities, as noted in the following summary. The following activities would be prohibited within the Sanctuary (15 CFR 922.82, Prohibited or otherwise regulated activities):

(1) Oil, gas or mineral exploration, development or production – same as CBNMS.

(2) Discharges – same prohibition and exceptions as CBNMS.

(3) Discharges from cruise ships – same prohibition and exceptions as CBNMS.

(4) Discharges from beyond the boundary of the Sanctuary that subsequently enter the Sanctuary and injure a Sanctuary resource or quality – same prohibition and exceptions as CBNMS.

(5) Constructing any structure other than a navigation aid on or in the submerged lands of the Sanctuary; placing or abandoning any structure on or in the submerged lands of the Sanctuary; or drilling into, dredging, or otherwise altering the submerged lands of the Sanctuary in any way, except:

- By anchoring vessels;
- While conducting lawful fishing activities;
- Routine maintenance and construction of docks and piers on Tomales Bay; or
- Mariculture activities conducted pursuant to a valid lease, permit, license or other authorization issued by the State of California.

(6) Operating motorized personal watercraft (MPWC), except:

- For emergency search and rescue missions or law enforcement operations (other than routine training activities) carried out by the National Park Service, U.S. Coast Guard, Fire or Police Departments or other Federal, State or local jurisdictions; or
- For a MPWC equipped with a GPS unit within the four designated zones within the expansion area of the sanctuary.*

(7) Taking any marine mammal, sea turtle, or bird within or above the Sanctuary – same as CBNMS.

(8) Possessing within the sanctuary any marine mammal, sea turtle, or bird taken – same as CBNMS.

(9) Possessing, moving, removing, or injuring a sanctuary historical resource – same as CBNMS.

(10) Introducing or otherwise releasing from within or into the Sanctuary an introduced species, except:

(i) Striped bass (*Morone saxatilis*) released during catch and release fishing activity – same as CBNMS; or

(ii) Species cultivated by mariculture activities in Tomales Bay pursuant to a valid lease, permit, license or other authorization issued by the State of California and in effect on the effective date of the final regulation.

(11) Disturbing marine mammals or seabirds by flying motorized aircraft at less than 1000 feet over the waters within the seven designated Special Wildlife Protection Zones (SWPZs) except to transport persons or supplies to or from the Farallon Islands or for enforcement purposes. Failure to maintain a minimum altitude of 1000 feet above ground level over such waters is presumed to disturb marine mammals or seabirds.[4]*

(12) Operating any cargo vessel engaged within an area extending one nm from a designated SWPZ. This includes but is 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 the Islands or mainland areas adjacent to Sanctuary waters.*

(13) Attracting a white shark in the Sanctuary; or approaching within 50 meters of any white shark within one nm of, and inside, the newly designated SWPZs around Southeast and North Farallon Islands.

[4] This presumption of disturbance could be overcome by contrary evidence that disturbance did not, in fact, occur (e.g., evidence that no marine mammals or seabirds were present in the area at the time of the low overflight). In February 2012 a Final Rule standardized NOAA regulations across the sanctuaries to reflect a consistent and clear regulatory approach (NOAA, Federal Register (Vol. 77, No.17; January 26, 2012).

(14) Deserting a vessel aground, at anchor, or adrift in the Sanctuary.

(15) Leaving harmful matter aboard a grounded or deserted vessel in the Sanctuary.

(16) Anchoring a vessel in a designated seagrass protection zone in Tomales Bay, except as necessary for mariculture operations conducted pursuant to a valid lease, permit or license.

(17) Interfering with enforcement action* – same as CBNMS.

Exceptions and Authorizations

There are proposed exceptions to the above prohibitions, as well as a proposed authorization procedure to allow certain activities:

- Exceptions for Emergencies – The above prohibitions do not apply to activities necessary to respond to an emergency threatening life, property or the environment, or as may be permitted by the Sanctuary Superintendent, with authority delegated by the ONMS Director, in accordance with criteria outlined in 15 CFR § 922.48 (National Marine Sanctuary permits – application procedures and issuance criteria) and specifically allowed within the GFNMS permit procedures and criteria (see below) – same as CBNMS.

- Department of Defense – All activities currently carried out by the Department of Defense are considered essential for national defense and not subject to the prohibitions listed above. Any additional activities would be exempted only after consultation with the Sanctuary Superintendent and the Department of Defense.

- Authorizations – Prohibited activities listed above in (2) through (9), may be allowed if they are authorized by a lease, permit, license, approval, or other authorization issued by another agency.* Introduction of an introduced species from shellfish mariculture determined to be non-invasive in state waters may also be allowed in GFNMS under this authorization process.[5] The same findings as described above for CBNMS authorizations would be applicable to GFNMS authorizations. In no event may the Director issue an authorization or otherwise approve oil, gas or mineral exploration, development or production within the Sanctuary.

Permits

The proposed regulations would extend permit procedures and criteria for issuing permits currently established in the sanctuary to the expansion area. The proposed GFNMS regulations would provide a permit process for otherwise prohibited activities (2) through (9) and (11) through (16). The criteria for issuing permits are the same as the proposed CBNMS permit provisions, including all findings listed above for CBNMS. In addition, the following clause proposed in CBNMS regulations would be included in GFNMS regulations:

- In no event may the Director issue a National Marine Sanctuary permit or otherwise approve oil, gas or mineral exploration, development or production within the Sanctuary.*

[5] A separate rulemaking is proposing to establish limited authority for GFNMS to authorize the introduction of introduced species from shellfish mariculture determined to be non-invasive, so this proposed regulation is the same as the introduced species rulemaking that will be in effect before the proposed expansion is finalized.

Summary of GFNMS Regulation Modifications

The proposed regulations for GFNMS listed above reflect the following modifications to existing sanctuary provisions and the reasoning behind the proposed changes:

- Delete the pipeline exemption from oil and gas and seabed disturbance prohibitions – Both of these existing prohibitions include an exception for pipelines in limited circumstances. The present regulatory language regarding oil and gas pipelines created confusion as to whether or not they were allowed with a permit (the oil and gas prohibition) or specifically exempted (the seabed disturbance prohibition). These exceptions are not included in either the oil and gas or seabed disturbance prohibitions in the proposed action. There are no existing or proposed oil or gas pipelines in the vicinity and no planned or reasonably foreseeable oil or gas development projects or leases that would necessitate pipelines in these sanctuaries. Oil and gas exploration and development would be prohibited throughout the sanctuaries. Should an oil or gas pipeline be proposed in the future, the new authorization process (described below) may be used to allow such a use. Therefore, the change in regulations regarding oil and gas pipelines is more of a technical clarification. However, should an authorization be used to allow an oil or gas pipeline, it would not necessarily be subject to the existing limitations that require that it be placed at a distance greater than 2 nm from the Farallon Islands, Bolinas Lagoon and Areas of Special Biological Significance (ASBS).

- Prohibit mineral extraction – NOAA is proposing to amend the regulation to also prohibit exploring for, developing, or producing minerals within the current boundary and expansion area of GFNMS to be consistent with CBNMS and Monterey Bay National Marine Sanctuary, which are both adjacent to and abutting GFNMS. No commercial exploration, development, or production of minerals is currently conducted, nor is such activity anticipated in the near future.

- Designate Special Wildlife Protection Zones (SWPZs) to use for regulatory protections (cargo vessels and overflight restrictions) instead of using ASBS and other specified locations – NOAA is proposing to rename the areas of overflight regulation Special Wildlife Protection Zones, make small changes to extend the areas of overflight regulation within the current existing boundaries of GFNMS overflight regulation and add two discrete areas with overflight restrictions in to the proposed expansion area. The new Special Wildlife Protection Zones would implement restrictions to disturbing marine mammals or seabirds by flying a motorized aircraft as well as to the sailing of cargo vessels. SWPZs would be established in areas of high biological diversity and/or abundance of species including federally listed and specially protected species such as seabird “hotspots” with important populations, species diversity, and high concentration of nesting birds and pinniped “hotspots” such as critical habitat and pupping areas. SWPZs would be established where such “hotspots” are susceptible to disturbance and need protection from certain activities that could harm these sensitive resources.

  The existing GFNMS regulations use a combination of specified locations and State ASBS to protect sensitive seabird and pinniped areas from cargo vessel disturbance or discharge, and from low flying aircraft disturbance. ASBS are those areas designated by California's State Water Resources Control Board as requiring protection of species or biological communities to the extent that alteration of natural water quality is undesirable. ASBS are a subset of State Water Quality

Protection Areas established pursuant to California Public Resources Code section 36700 et seq. These areas were designated based on the presence of certain species or biological communities that, because of their value or fragility, deserve special protection by preserving and maintaining natural water quality conditions to the extent practicable.

The State could change the location or size of ASBS, subsequently changing the location of sanctuary cargo vessel and low overflight prohibitions linked to the ASBS. Within the existing GFNMS boundaries, ASBS coincide with areas of high biological diversity and/or abundance of species, but the existing ASBS in the expansion area (Saunders Reef, Del Mar Landing, Gerstle Cove and Bodega) do not coincide with the seabird and pinniped hotspots and are not in locations that could provide adequate protections to these wildlife as a result of sanctuary cargo vessel or low flying aircraft prohibitions. Therefore, SWPZs are proposed to better reflect resource areas needing protection from certain human activities and to provide consistency between the existing and proposed boundary areas.

In the existing sanctuary boundaries, the proposed SWPZs would remain similar in size and location to the areas currently protected from cargo vessels and low flying aircraft. The changes within the existing sanctuary boundaries are considered minor modifications. The shape of the protected areas would change from circles to polygons and would be delineated around known points, islands and landmarks, instead of following ASBS boundaries or specific named locations (e.g., Bolinas Lagoon). Whereas the ASBS and specified location boundaries are rounded, the SWPZ boundaries would be straight lines along specified longitudes and latitudes to allow for easier navigation. The middle island of the Farallones, which is currently included in the protected area around the Farallones, has not been included in a SWPZ because there are no wildlife resources on it. Even though new SWPZs would be established under sanctuary regulations, the State-designated ASBS would remain in place and continue to function as established under State law. The references to ASBS would be removed from the GFNMS regulations, and a new definition to describe SWPZs would be added to the GFNMS regulations. There would be a total of five SWPZs in the current sanctuary boundaries, which would be subject to protection from cargo vessel traffic and low overflights pursuant to prohibitions in the proposed regulations. These zones include: Tomales Point, Point Reyes, Duxbury Reef-Bolinas Lagoon, and two zones at the Farallon Islands (shown in Figures 3.2 4, 3.2-5, 3.2-6 and 3.2-7), described as follows:

- SWPZ 3 would encompass the area within the sanctuary surrounding Tomales Point and the northern portion of Tomales Bay to the east shore at Toms Point, and north to Estero de San Antonio. The proposed change would increase the area by approximately 5 sq miles to a total area of 9.3 sq miles (7 sq nm). However, it would only increase the time an aircraft would have to stay above 1,000 feet by approximately 35 seconds if traveling at a speed of 120 miles per hour, assuming the flight line is roughly parallel to the coast.

- SWPZ 4 would encompass the area within the sanctuary surrounding Point Reyes. This change in shape would increase the area by approximately 1.8 sq miles to a total size of 13.5 sq miles (10.2 sq nm), but it would not increase the time an aircraft would have to stay above 1,000 feet if traveling at a speed of 120 miles per hour.

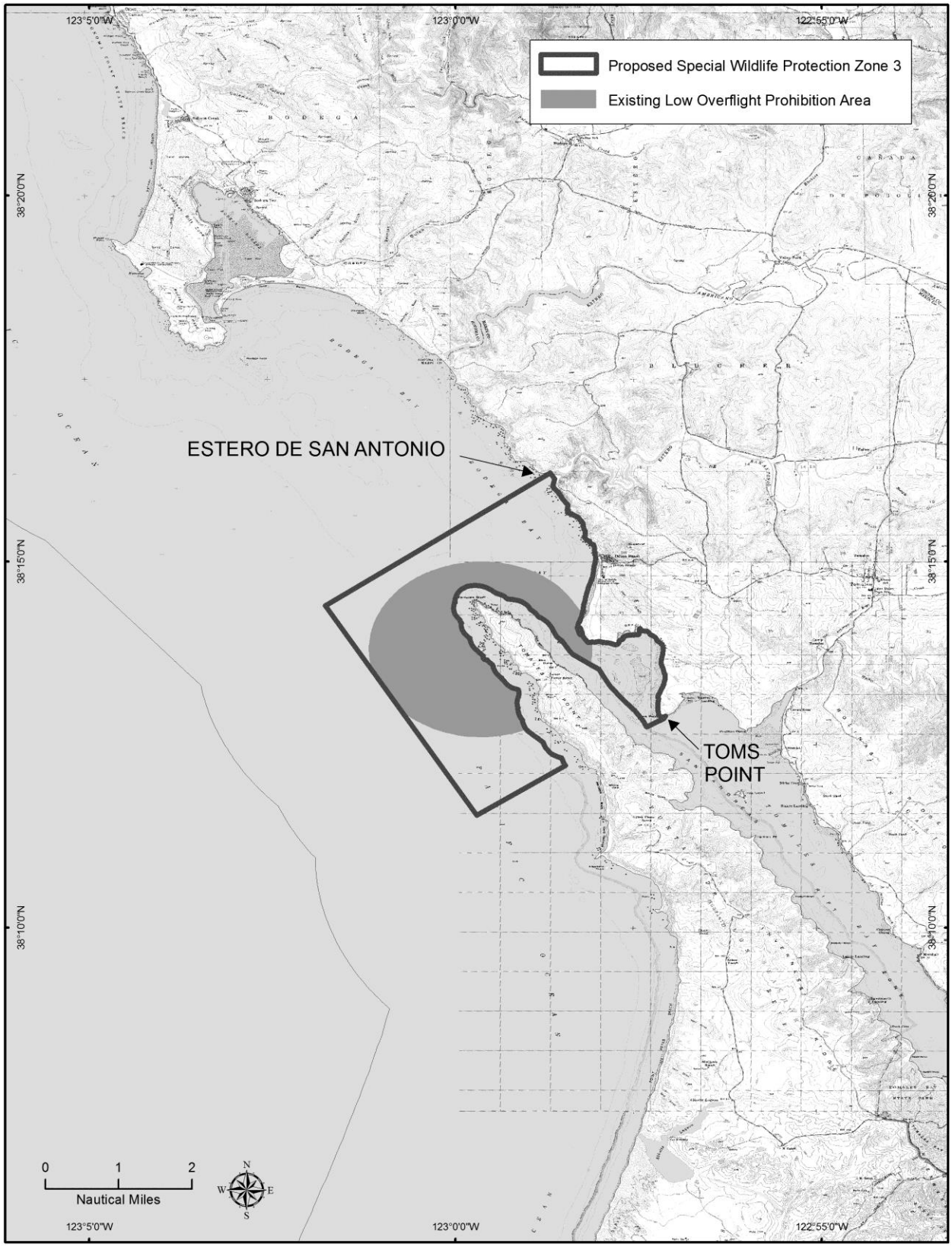

Figure 3.2-4. Proposed Special Wildlife Protection Zone 3 – Tomales Point

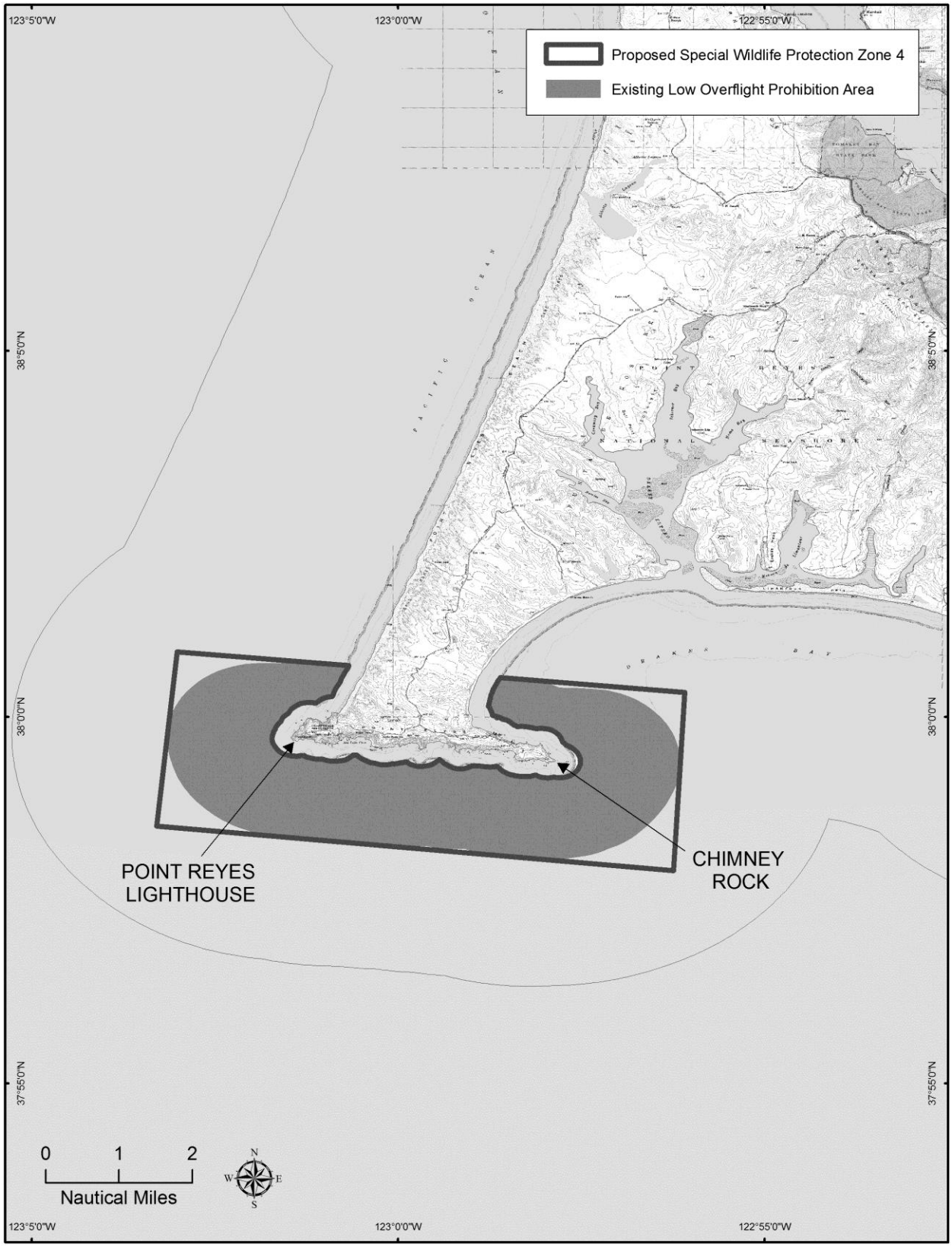

Figure 3.2-5. Proposed Special Wildlife Protection Zone 4 – Point Reyes

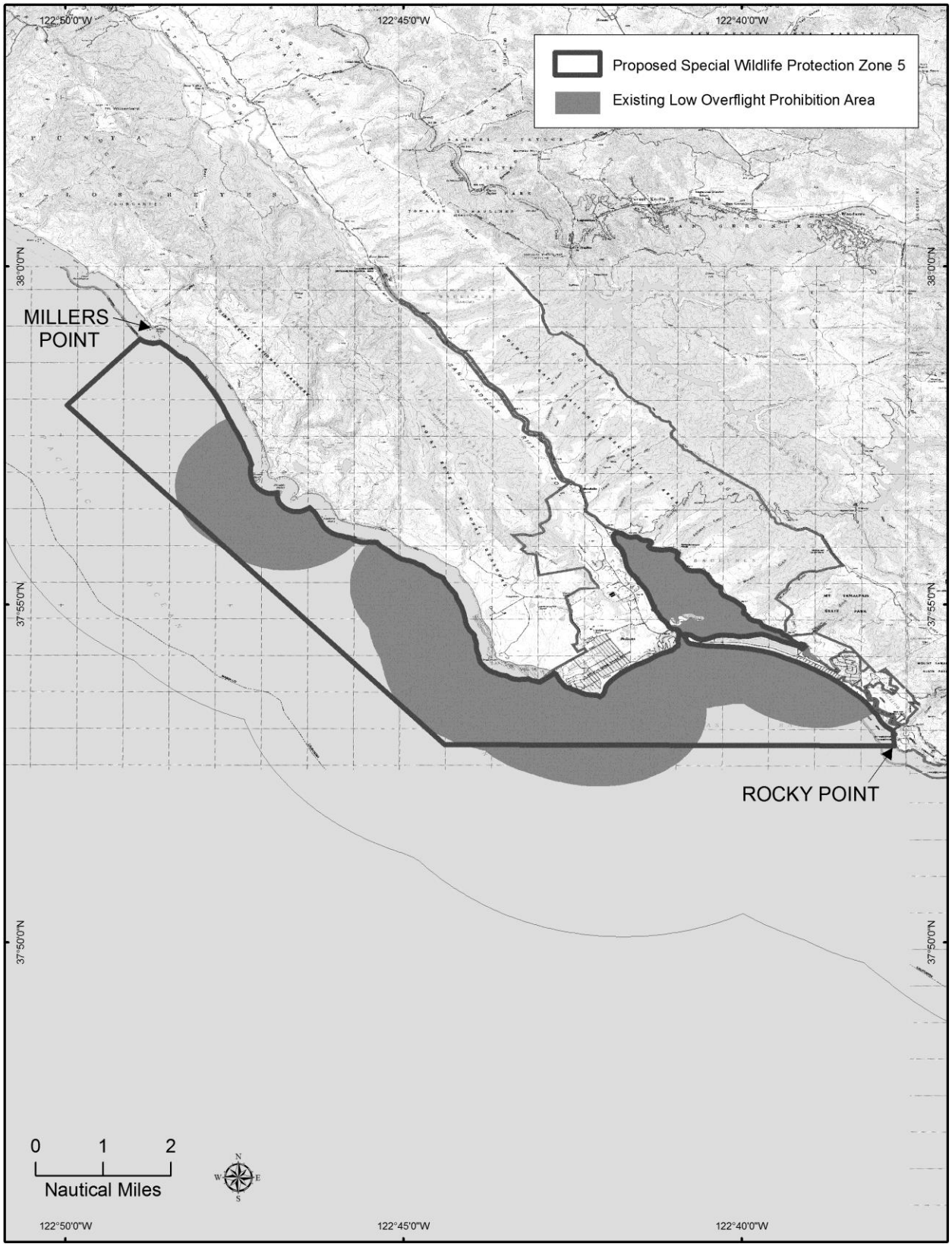

Figure 3.2-6. Proposed Special Wildlife Protection Zone 5 – Duxbury Reef– Bolinas Lagoon

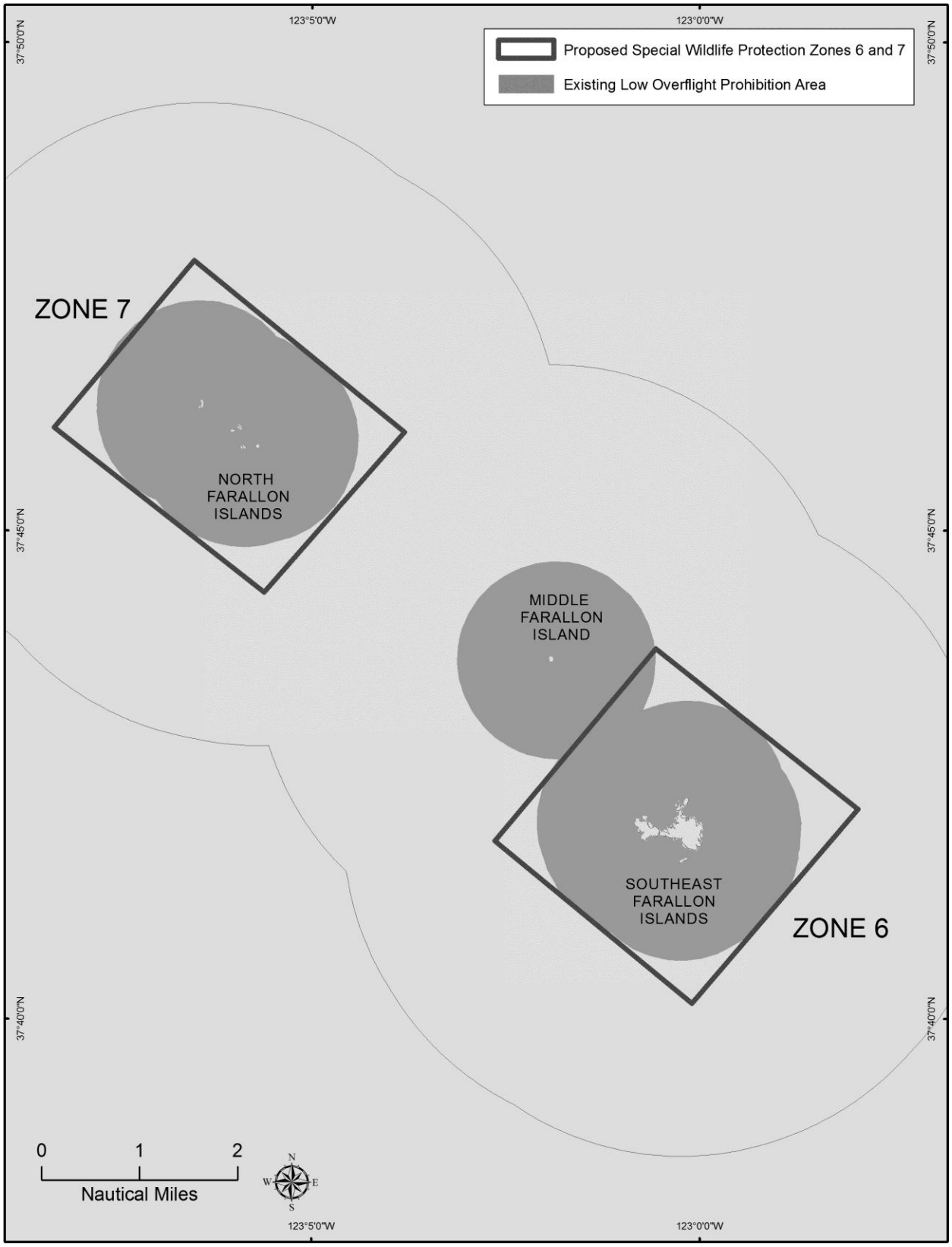

Figure 3.2-7. Proposed Special Wildlife Protection Zones 6 and 7 – Farallon Islands

- SWPZ 5 would encompass all of Bolinas Lagoon, but not Seadrift Lagoon, and extend west to Bolinas Bay, south to Rocky Point and north to Millers Point. The proposed change would increase the area by approximately 4.5 sq miles to a total size of 19.6 sq miles (14.8 sq nm) and increase the time an aircraft would have to stay above 1,000 feet by approximately 20 seconds if traveling at a speed of 120 miles per hour.

- SWPZ 6 would extend approximately one nm seaward of Southeast Farallon Island and Maintop Island. The proposed change would decrease the area by approximately 2.2 sq miles to a total size of 9 sq miles (6.8 sq nm) and decrease the time an aircraft would have to stay above 1,000 feet by approximately 60 seconds if traveling at a speed of 120 miles per hour.

- SWPZ 7 would extend approximately one nm seaward of North Farallon Island and Isle of St. James. The proposed change would increase the area by approximately 1.4 sq miles to a total size of 7.9 sq miles (6 sq nm), but would not increase the time an aircraft would have to stay above 1,000 feet if traveling at a speed of 120 miles per hour.

■ Create two SWPZs in the proposed expansion area (see Figure 3.2-8 and 3.2-9) near Gualala and Fort Ross – As mentioned above, State designated ASBS in the proposed northern expansion area do not overlap with sensitive seabird and pinniped colonies and do not adequately protect areas of high biological diversity and/or abundance of species. Therefore, the four existing ASBS within the proposed expansion area were not used as a basis for wildlife protection; instead the proposed action includes two designated SWPZs.

- SWPZ 1 would encompass an area of approximately 10.5 sq miles (7.9 sq nm), extending from Haven's Neck in Mendocino County ten miles south to Del Mar Point in Sonoma County. The overflight time would be about 200 seconds (3.33 minutes) for an aircraft traveling at 120 miles per hour. SWPZ 1 would include observed pinniped haul-out areas, three species of breeding seabird colonies and one roosting seabird species at Fish Rocks; and observed pinniped haul-out areas and five species of breeding seabirds at Gualala Point Island.

- SWPZ 2 would encompass an area of approximately 21.4 sq miles (16.2 sq nm) offshore Sonoma County, extending from Windermere Point north of the Russian River approximately 14 miles to Duncans Point. The overflight time would be about 375 seconds (6.25 minutes) for an aircraft traveling at 120 miles per hour. SWPZ 2 would include observed Steller Sea Lion haul out areas at Northwest Cape (Fort Ross); and harbor seal haul out areas and five species of breeding seabirds throughout the entire Russian River Colony Complex, which is a system of offshore rocks north and south of the Russian River.

■ Establish prohibitions associated with SWPZs – The following activities would be prohibited in proposed SWPZs in both the existing sanctuary and proposed expansion area:

- Operating a cargo vessel within an area extending one nm from a SWPZ (see Figure 3.2-10);
- Flying lower than 1,000 feet above sea level over a SWPZ.

Cargo vessels would be required to sail at least one nm from any SWPZ. Although the proposed regulation would change the buffer in the existing zones from 2 nm to one nm, the proposed new

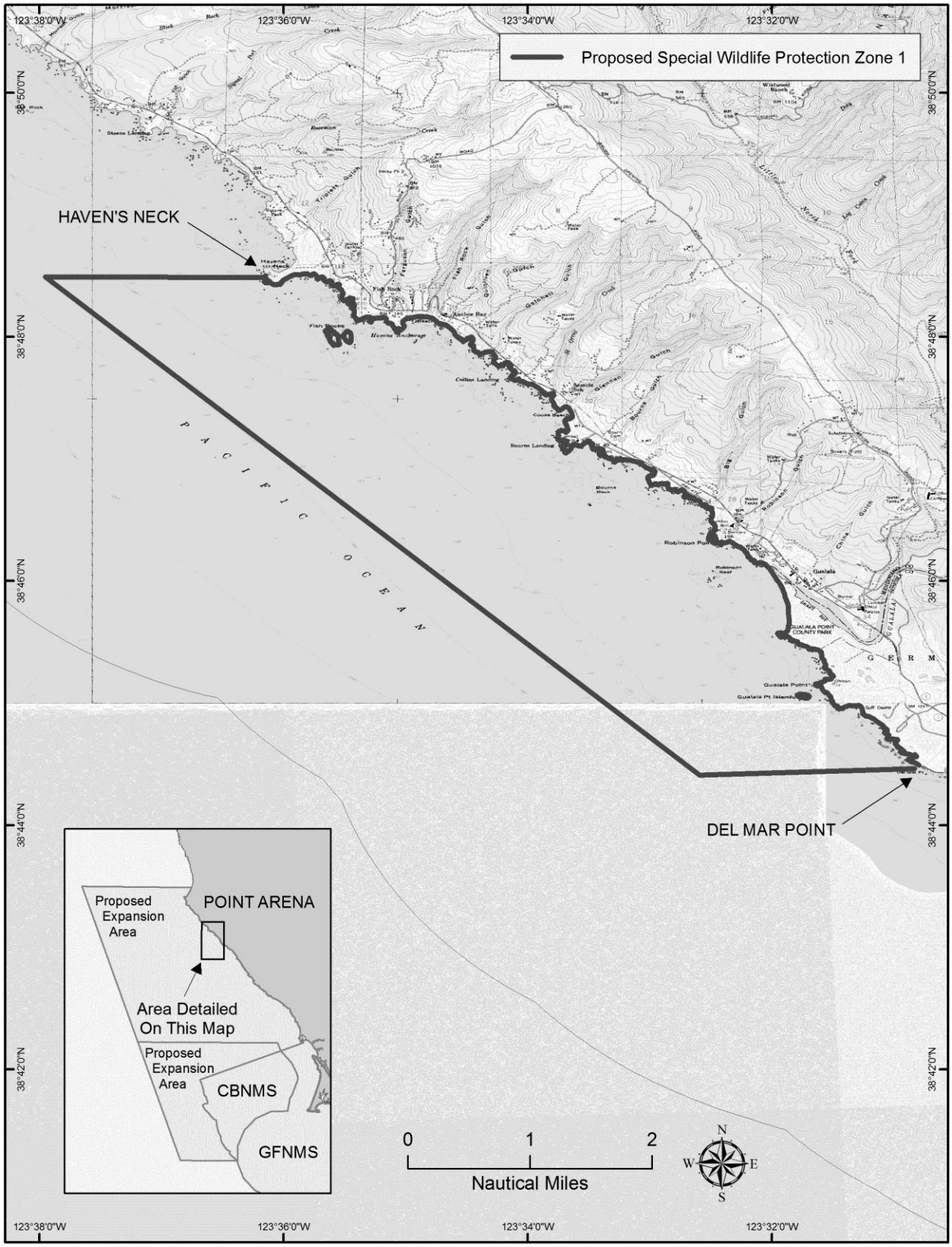

Figure 3.2-8. Proposed Special Wildlife Protection Zone 1 – Point Arena

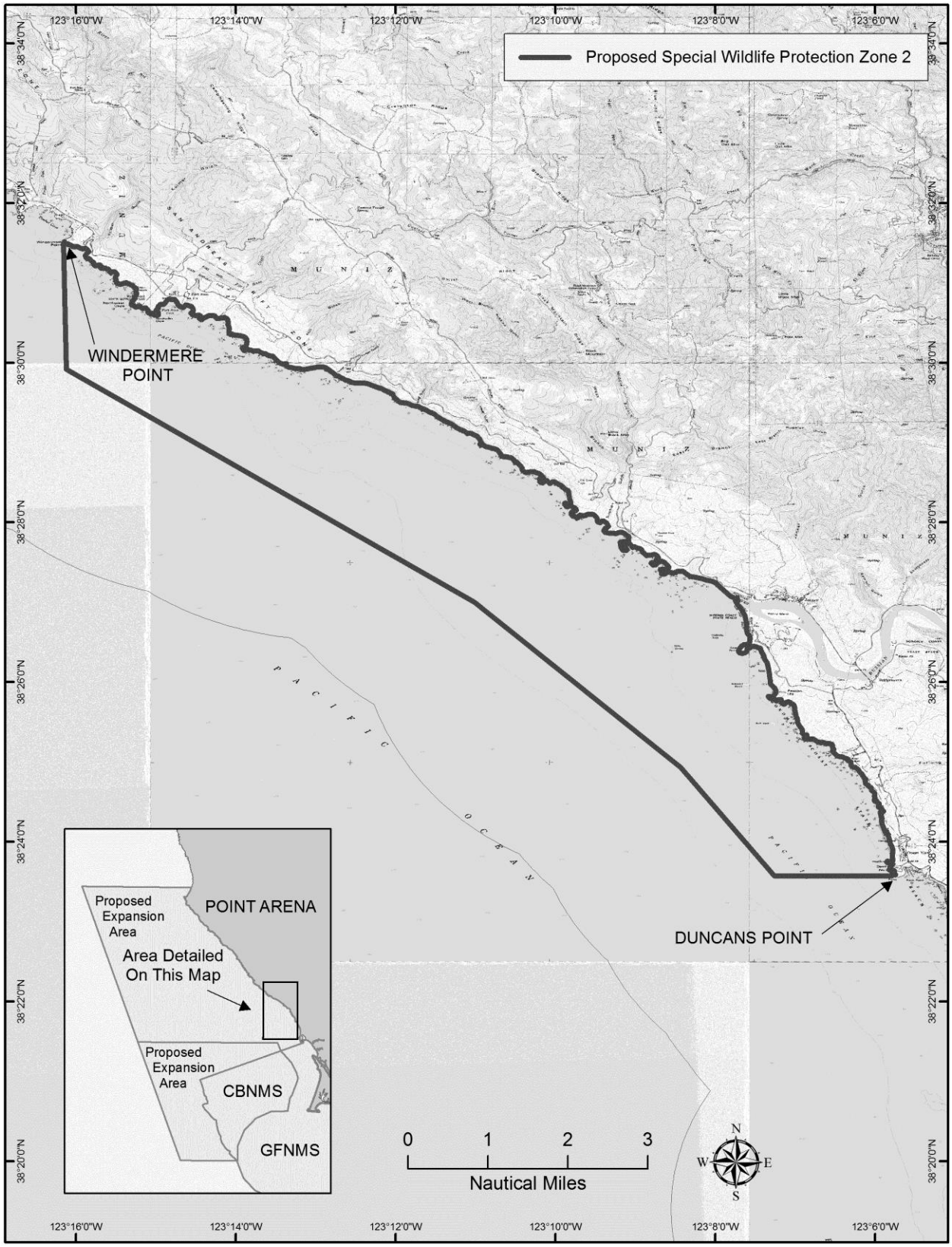

Figure 3.2-9. Proposed Special Wildlife Protection Zone 2 – Fort Ross

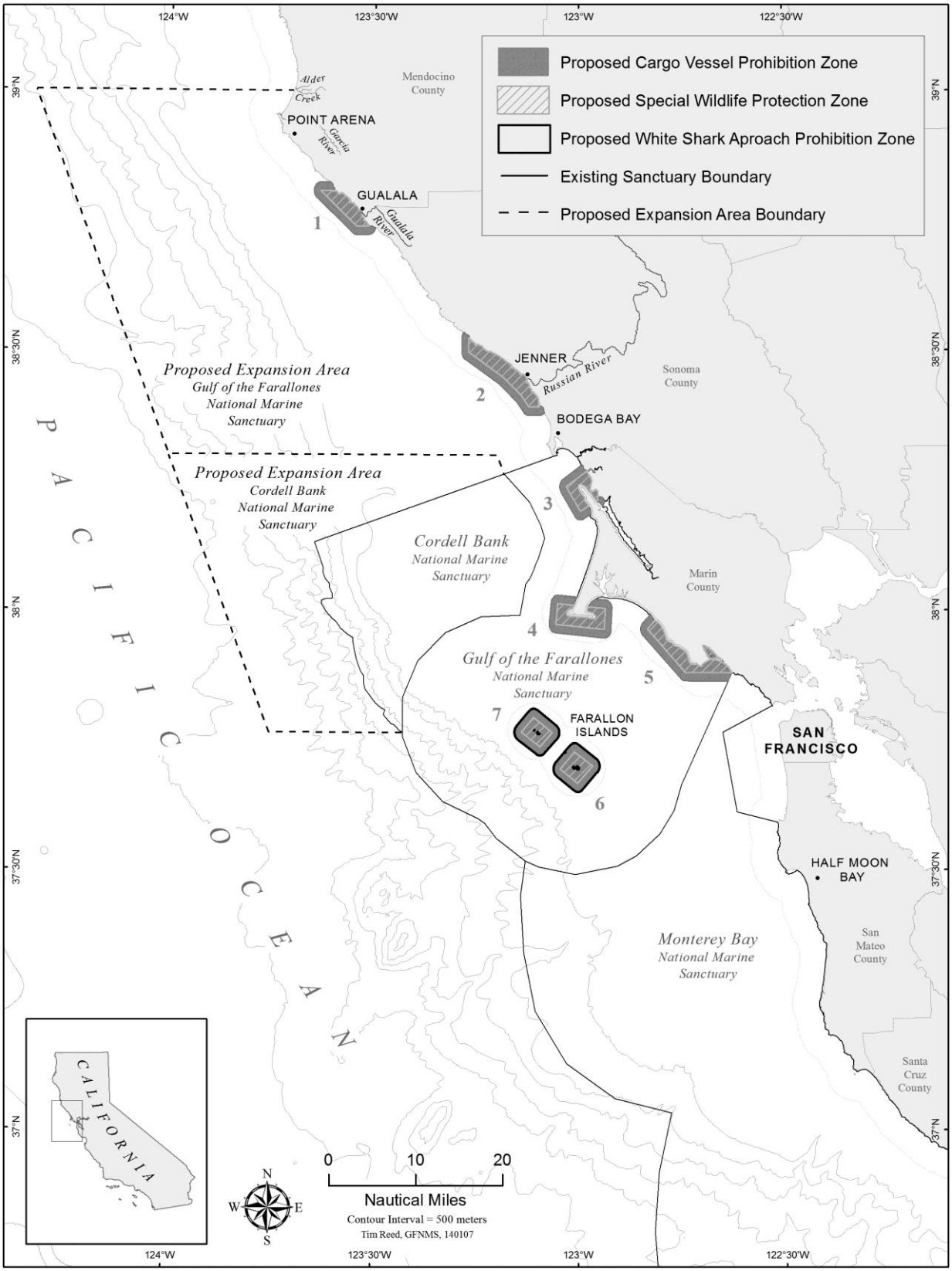

Figure 3.2-10. Proposed Cargo Vessel Prohibition Zones and Proposed White Shark Approach Prohibition Zones

SWPZs would encompass approximately the same areas that were previously identified in the regulations. Therefore, the proposed new cargo vessel prohibition would remain similar in size and location to the areas currently protected from cargo vessels.

- Prohibit approaching white sharks within one nm of the two SWPZs around the Southeast and North Farallon Islands, similar to existing regulations – NOAA is proposing to refine and further delineate the zone prohibiting approaching a white shark within two nautical miles of the Farallon Islands by creating two zones that encompass both the Southeast and North Farallon Islands (see Figure 3.2-10).. The existing zone is circular and surrounds all the Farallon Islands. The two new zones would be changed to a polygon and match the cargo vessel prohibition zones by creating a one nautical mile buffer around proposed SWPZs 6 and 7. The location and size of the zones would remain effectively similar to the current prohibition at both the Southeast and North Farallon Islands, however, the area around Middle Farallon Island would be removed resulting in a total area that is smaller than the existing zone. Middle Farallon Island is not considered to be a location of primary food source (i.e., pinnipeds) for white sharks.

- Create three year-round MPWC use zones and one seasonal MPWC zone (see Figure 3.2-11, overview of zones, and Figures 3.2-12, 3.2-13, 3.2-14 and 3.2-15 for individual proposed zones) within the proposed expansion area — MPWC, which are often referred to as "jetskis"® or simply "skis," include several small vessel designs that share similar performance characteristics.[6] NOAA has restricted the use of MPWC within various sanctuaries when MPWC operation poses a unique and significant threat of disturbance to sanctuary habitats and wildlife through repetitive operation within sensitive environments. NOAA assessments of MPWC impacts indicate that unrestricted access to all reaches of the sanctuary by such craft are likely to pose a threat to wildlife. Some MPWC operators commonly accelerate and decelerate repeatedly and unpredictably, travel at rapid speeds directly toward shore, and may maneuver close to rocks, while motorboat operators generally transit through areas at steady speeds and bearings and slow down as they approach shore and offshore rocks. Thus wildlife disturbance impacts from MPWC tend to be more likely than those from motorboat use, due to impacts in ecologically sensitive areas, often in nearshore locations.

  Potential impacts include physical damage to marine life and shallow habitats and behavioral modification and site abandonment/avoidance by sea birds and marine mammals. Research indicates that impacts associated with MPWC tend to be locally concentrated, producing effects that are more geographically limited yet potentially more severe than from motorboat use, due to repeated disruptions to wildlife and an accumulation of impacts in a shorter period of time (Snow 1989). The smaller size and shallower draft of MPWC means they are more maneuverable and operable closer to shore and in shallower waters than other types of motorized watercraft (U.S. Dept. of Interior 1998). These characteristics greatly increase the potential for MPWC to disturb fragile nearshore habitats and organisms.

[6] ONMS is currently in the process of modifying the definition of MPWC as part of nationwide rulemaking; the new definition will be incorporated into GFNMS regulations when the new definition is finalized. For more information, refer to the proposed rule describing this ongoing regulatory process at 78 FR 5998.

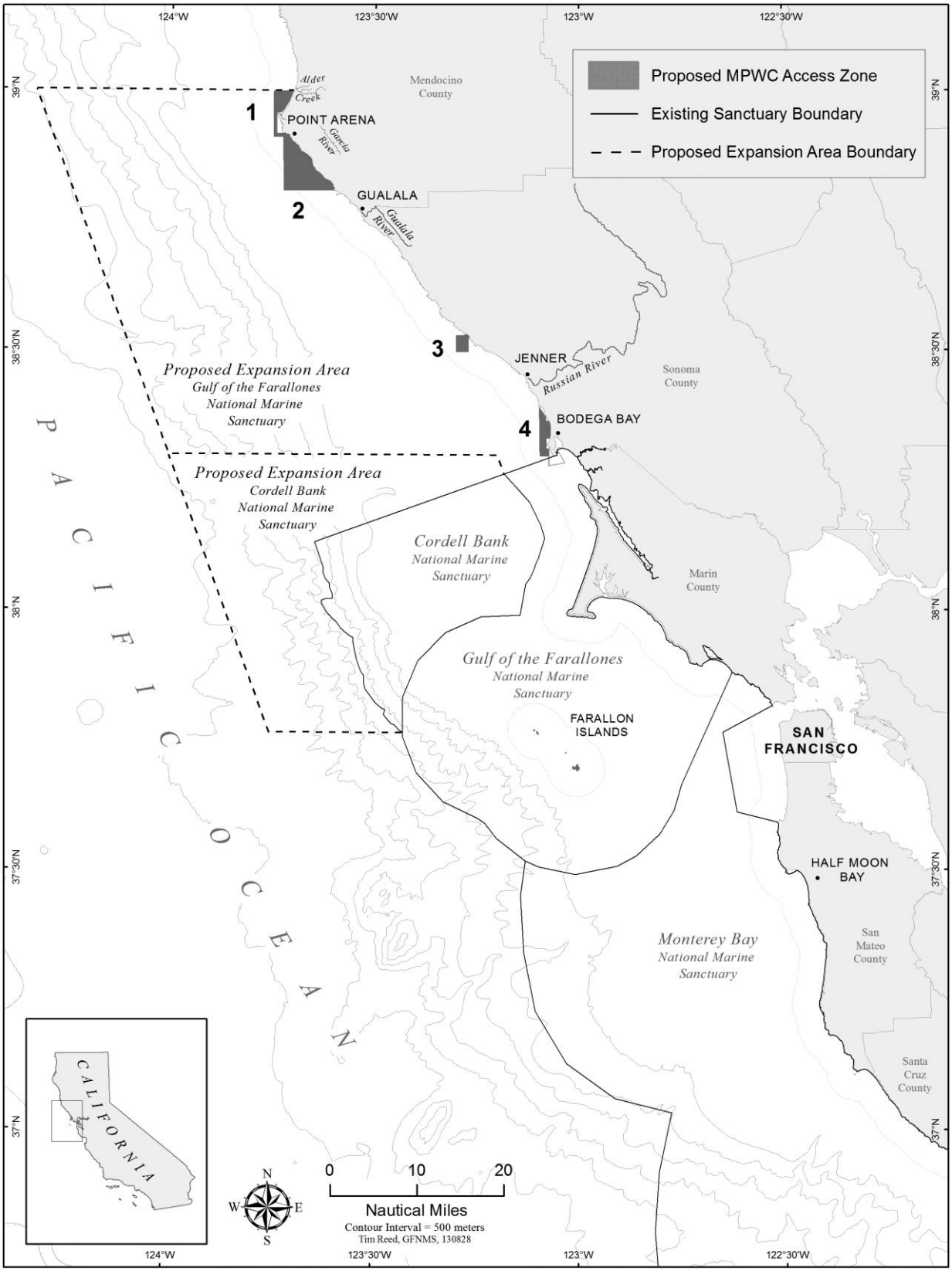

Figure 3.2-11. Proposed MPWC Zones Overview

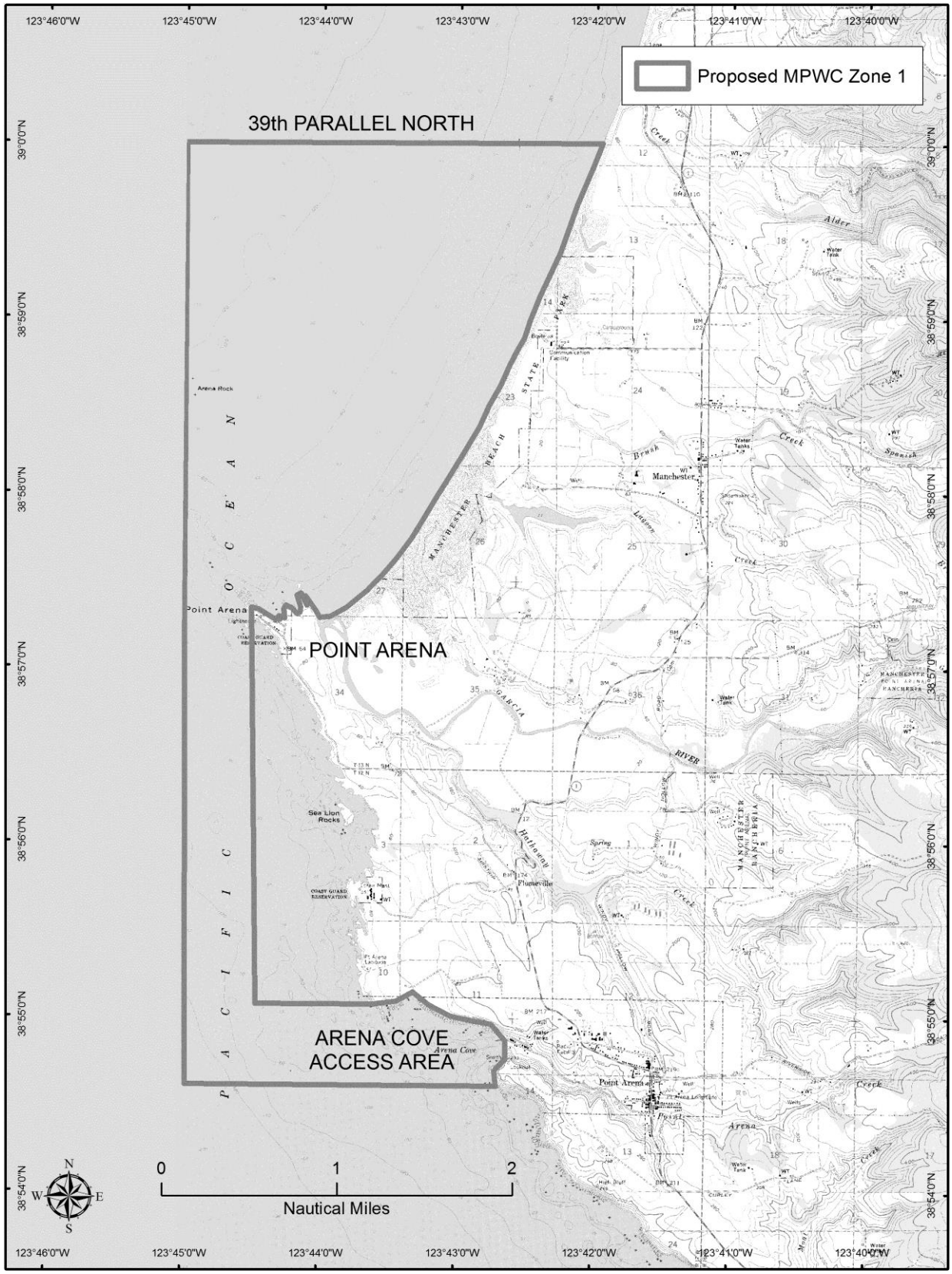

Figure 3.2-12. Proposed MPWC Zone 1

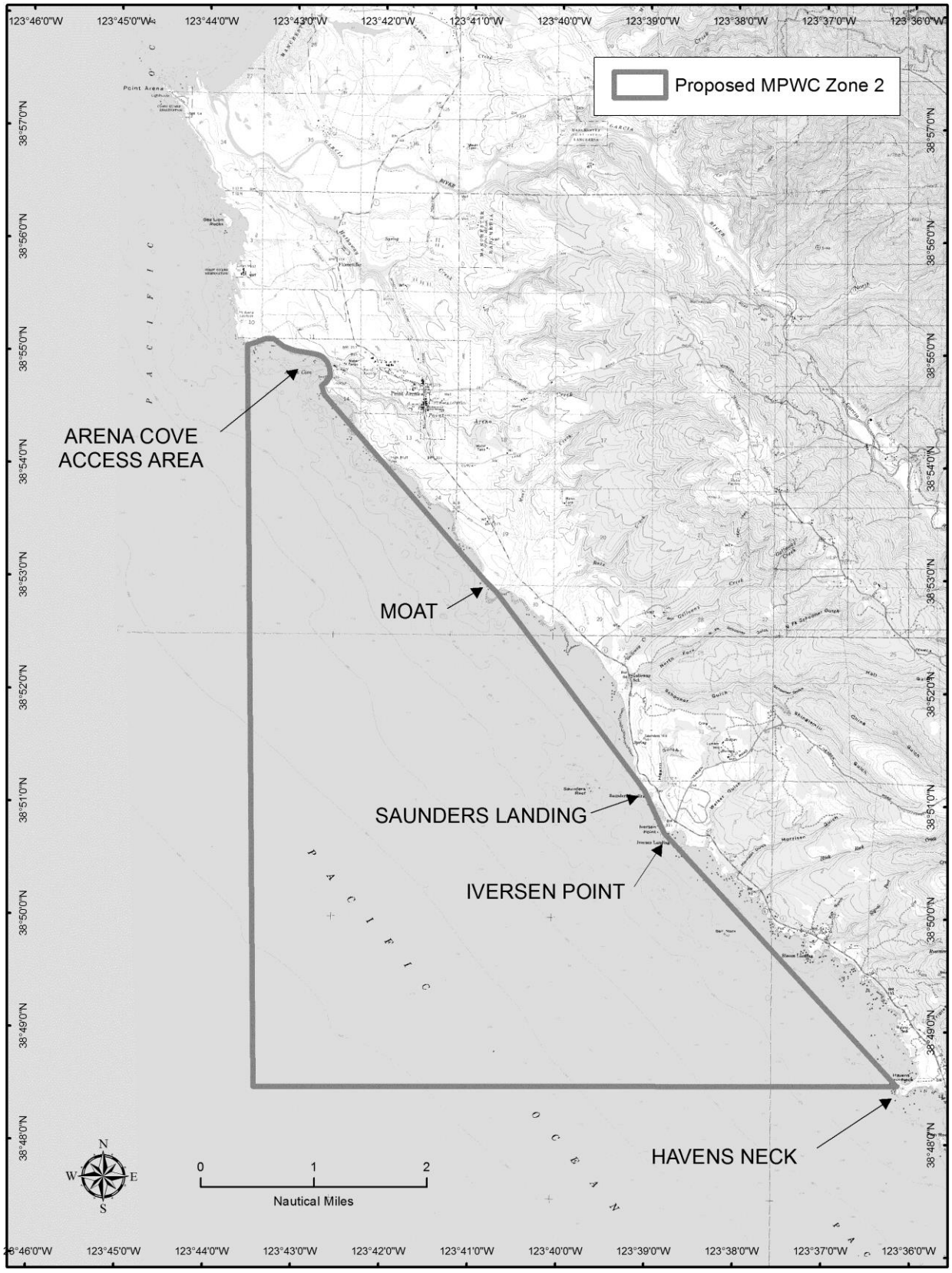

Figure 3.2-13. Proposed MPWC Zone 2

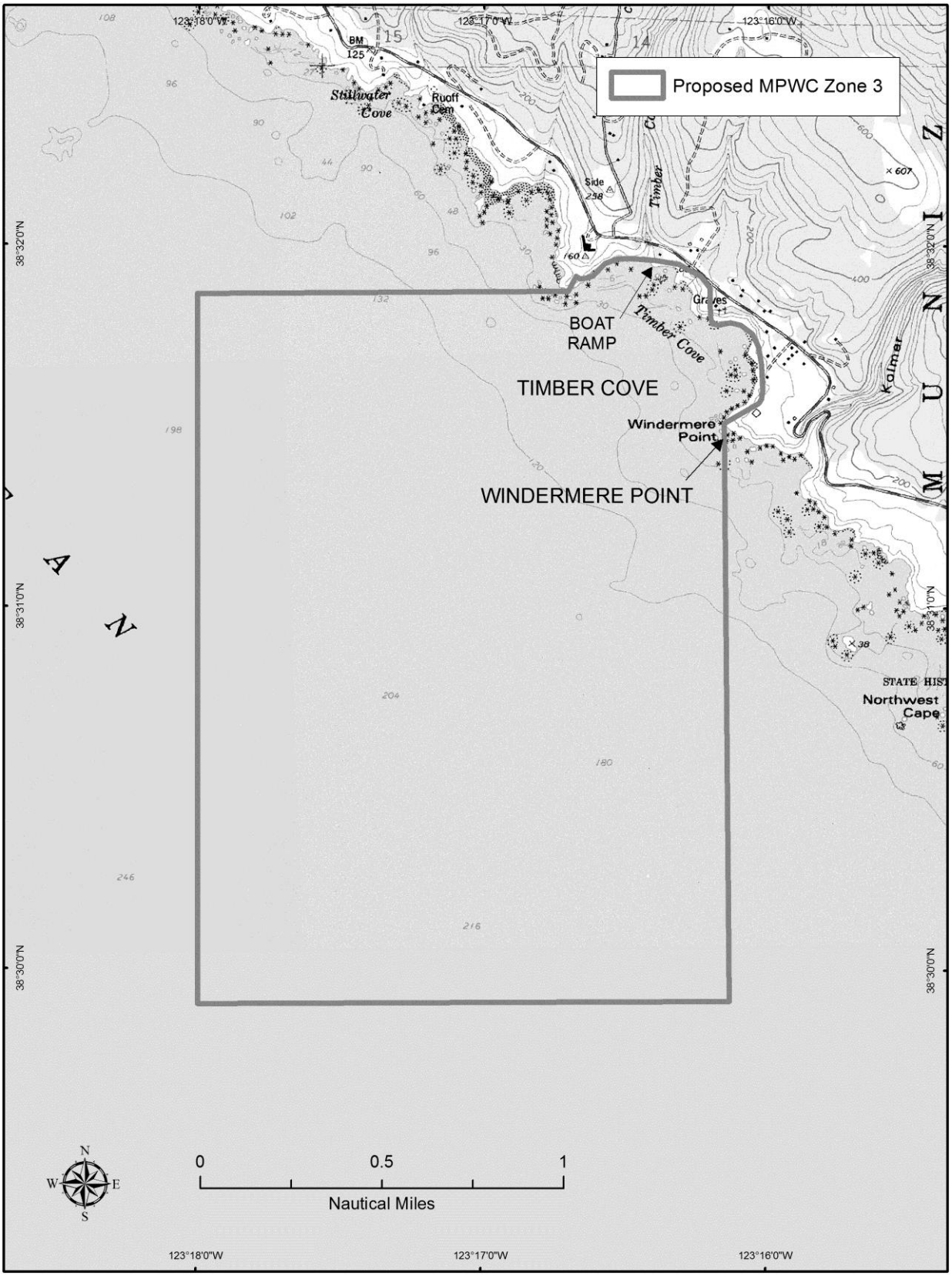

Figure 3.2-14. Proposed MPWC Zone 3

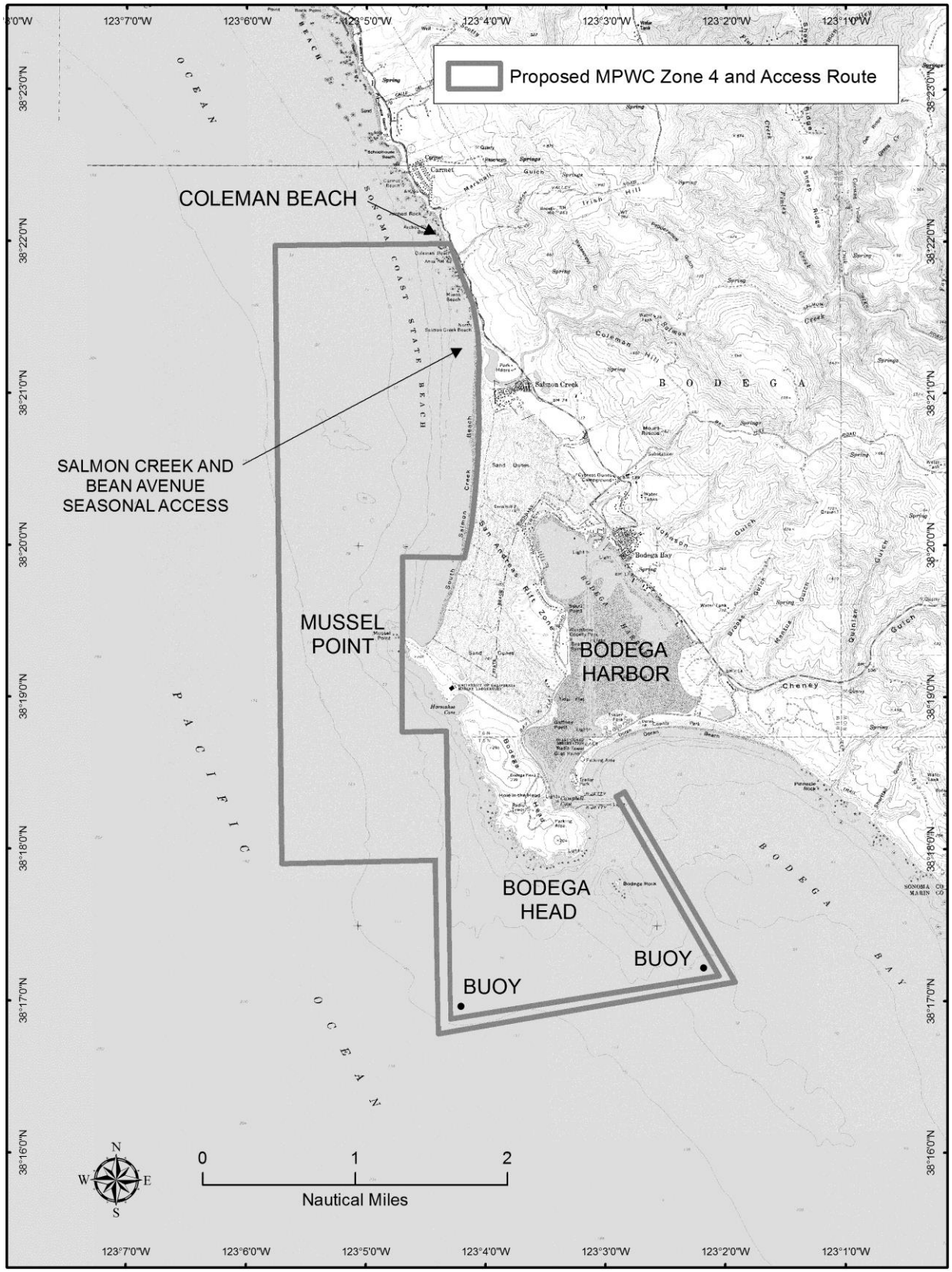

Figure 3.2-15. Proposed MPWC Zone 4

To help protect habitats and sensitive marine life, operation of MPWC would be restricted to four designated zones within the Sanctuary and would limit access to the nearshore. One of the four zones, Zone 1, would be seasonal and would only be accessed from October to February to provide protection to the threatened Snowy Plover off Manchester Beach during their nesting season. The boundaries for each of the proposed MPWC operating zones are described in detail below and shown on Figures 3.2-12 through 3.2-15. MPWC operators would launch at only at the four specified access areas. There would be only one access area in each zone, and each zone would be designed to keep MPWCs offshore to the extent practicable.

The proposed regulations specify that an operable GPS unit in working condition must be carried on all MPWC accessing each zone in order to accurately and precisely navigate to MPWC zones and to ensure that the MPWC stays within the designated zones. Collectively, the four proposed zones encompass 2.2% of the proposed expansion area (33.4 nm^2). The establishment of the four designated zones would mean that MPWC would be prohibited outside these zones (except as exempted in the regulation or through a national marine sanctuary permit). Access to the proposed zones by conventional vessels would continue unchanged. The proposed action would prohibit the use of MPWC in 97.8% of the waters of the proposed expansion area, and when combined with the existing GFNMS, would prohibit the use of MPWC in 98.7% of the total sanctuary waters. The sites of the three zones have been specifically proposed to minimize and/or prevent impacts on nearshore wildlife and to protect known seabird and pinniped hotspots, which include areas of high biological diversity and/or abundance of species; and/or federally listed and specially protected species.

Lifeguards and other safety professionals have used MPWC for surf rescue in other areas, such as within MBNMS, with the full support of NOAA. NOAA will continue to support public agency MPWC search and rescue operations throughout the waters of the sanctuary. NOAA would also support MPWC training activities by public safety agencies through a permitting process.

Wildlife distribution and use patterns in the study area differ from GFNMS and MBNMS. Because of the rockier shoreline, lack of estuaries and sandy beaches, and more powerful wave conditions in the study area, wildlife has fewer areas to take refuge on the outer coast. It is critical that the few sites available for breeding seabirds and pinnipeds be protected from disturbance.

The four proposed MPWC zones would avoid the proposed SWPZs and include traditional coastal access points. The proposed zones, based on public comment regarding use areas, would be located as follows:

- Zone 1 (From latitude 39 to Arena Cove) (Area: 8.5 sq miles, 6.4 sq nm) – This seasonal zone would be open from October to February. It would be closed from March to September to limit potential negative interactions with MPWC landing on Manchester beach during the time that Snowy Plovers, listed as threatened by the Endangered Species Act, nest on beach (see Figure 3.2-12).

- Zone 2 (From Arena Cove to Havens Neck) (Area: 26.2 sq miles, 19.8 sq nm) – Because of the orientation of the coastline, compliance with borders in the nearshore using lines of latitude and longitude would be difficult. Prominent visual markers at Arena Cove, Moat, Saunders Landing,

Iverson Landing and Haven's Neck would be used to define the eastern boundary. The proposed zone would require MPWC users to stay seaward of all the listed points at all times. Use of waypoints at each of the shoreside locations would help operators with compliance. The area by this zone has few beaches or places of refuge on the shoreline, and many cliffs and coastal rocks and sea stacks, so MPWC generally operate offshore in this region (see Figure 3.2-13).

  - Zone 3 (Timber Cove) (Area: 3.8 sq miles, 2.9 sq nm) – Zone 3 would be accessed through a boat ramp at Timber Cove (see Figure 3.2-14).

- Zone 4 (From Bodega Head to Coleman Beach) (Zone Area: 6.1 sq mi, 4.6 sq nm, including access area) – A 100-yard access route from Bodega Harbor (within the current GFNMS boundary) using the harbor entrance and two navigational buoys would allow entrance to the southern boundary of the zone. Seasonal access would also be available through Salmon Creek, at Bean Avenue and the Ranger's Station (see Figure 3.2-15).

- Remove existing limited pipeline authorization language (referred to as "certification" in 15 CFR 922.84) and replace with a general authorization provision – The existing language allows the Sanctuary to approve a permit, license, or other authorization issued by another agency allowing the laying of any pipeline related to hydrocarbon operations in leases adjacent to the sanctuary and placed at a distance greater than 2 nm from the Farallon Islands, Bolinas Lagoon, and any ASBS as consistent with the purpose of the sanctuary and only if there is no significant effect on sanctuary resources. This provision would be replaced by an authorization provision, similar to the proposed CBNMS authorization provision allowing the Sanctuary Superintendent to approve or authorize some but not all otherwise prohibited activities permitted or licensed by any Federal, State, or local authority of competent jurisdiction in certain instances.

  As in CBNMS, current GFNMS permit regulations do not allow the authorization of any prohibited activity other than through the issuance of a national marine sanctuary permit, to (1) further research or monitoring related to Sanctuary resources and qualities; (2) further the educational value of the Sanctuary; (3) further salvage or recovery operations; or (4) assist in managing the sanctuary. The proposed authorizations would potentially allow some activities that are currently prohibited under existing sanctuary regulations so, like in CBNMS, this change would have implications for the existing sanctuary, as well as the proposed expansion area. The proposed list of activities that could be authorized in GFNMS differs slightly from the proposed list of activities in CBNMS. Activities including the discharge, construction, drilling, dredging or other disturbance on submerged land, operating motorized personal watercraft, taking and possessing a marine mammal, sea turtle, or bird, and possessing historical resources, which are currently prohibited in the existing sanctuary may be authorized under this new proposed provision. Furthermore, consistent with the recent rulemaking regarding introduced species, shellfish mariculture using non-invasive introduced species could be authorized throughout State waters in the sanctuary.

  The authorization process would establish a mechanism for allowing new activities within the existing sanctuary and the proposed expansion area if they were approved by another authorizing entity, such as alternative energy projects, sewage outfalls, laying cables, road construction that included ocean discharges, dredging to establish and maintain marinas, establishing new dredge

disposal sites, coastal armoring, or construction of pipelines, groins, jetties, piers and marinas. However, authorization of any such uses would be subject to terms and conditions deemed necessary by the Director to protect sanctuary resources and qualities.

- Regulate uses – The following known activities in the proposed expansion area would require sanctuary management approval in order for the activity to continue: fireworks launched from the end of the Arena Cove pier (from which debris falls into the ocean), moorings, and Bodega Marine Laboratory discharge. There may be additional existing activities that would require approval. There are three mechanisms to allow otherwise prohibited activities: (1) certification of existing permitted uses within 60 days of final approval of the proposed sanctuary expansion, under the national marine sanctuaries program regulations (15 CFR 922.47);[7] (2) authorization, as provided for in the proposed action regulations and described above; and (3) national marine sanctuary permits, in limited circumstances, as described above. All three of these options are subject to conditions and limitations.

  - *Fireworks* – Even though the pier and the waters inshore of the pier are outside the sanctuary boundary, deploying fireworks at the end of the pier would potentially result in a prohibited discharge into sanctuary waters west of the pier. This activity could potentially be authorized by the Sanctuary under the authorization provision of the proposed action outlined in the regulations or, if permitted by another agency as of the date of sanctuary expansion, potentially allowed under the national marine sanctuaries certification process. Deployment of fireworks, if determined not to injure sanctuary resources, may qualify for a special use permit.[8] Therefore there are several ways that fireworks displays can be allowed.

  - *Moorings* – The use of moorings in sanctuary waters is considered both a discharge of material and placement of a structure on, or alteration of, the submerged lands of the sanctuary. Although both of these activities would be prohibited by regulations in the proposed action, moorings could be authorized in the sanctuary (under the proposed authorization provision) if they are authorized or permitted by State Lands Commission, the California Coastal Commission and/or other Federal, State, or local authorities of competent jurisdiction. Existing moorings permitted or authorized by State Lands Commission, the California Coastal Commission and/or other Federal, State, or local authorities of competent jurisdiction could also be allowed under the national marine sanctuaries certification process directly following the expansion of the sanctuary, if the expan-

[7] National Marine Sanctuaries Program Regulations 15 CFR 922.47 states that "Leases, permits, licenses, or rights of subsistence use or access in existence on the date of designation of any National Marine Sanctuary shall not be terminated by the Director. The Director may, however, regulate the exercise of such leases, permits, licenses, or rights consistent with the purposes for which the Sanctuary was designated." The regulation requires compliance with certification procedures and criteria promulgated at the time of Sanctuary designation.

[8] In a separate policy (May 3, 2013), NOAA issued a final list of categories of activities that are subject to the provisions of a special use permit under Section 310 of the National Marine Sanctuaries Act. Relevant categories include: placement and recovery of objects associated with public or private events on non-living substrate of the submerged lands of any national marine sanctuary; placement and recovery of objects related to commercial filming; continued presence of commercial submarine cables on or within the submerged lands of any national marine sanctuary; disposal of cremated human remains within or into any national marine sanctuary; fireworks displays; and the operation of aircraft below the minimum altitude in restricted zones of national marine sanctuaries.

sion is finalized. Recognizing that some existing moorings are not currently permitted or authorized by a competent jurisdiction, NOAA would work with the California State Lands Commission to facilitate a process to bring those moorings into compliance in a similar way as the implementation of the Tomales Bay Vessel Management Plan (2013). The third option, national marine sanctuary permits, under the permit authorities in Section 922.83, would be limited to the scope of the authorities: further research or monitoring related to sanctuary resources and qualities; further the educational value of the sanctuary; further salvage or recovery operations; or to assist management of the sanctuary. The permit option would require State Lands Commission, the California Coastal Commission and/or another Federal, State, or local authority of competent jurisdiction to apply for a national marine sanctuary permit to assist in the management of the sanctuary, subject to terms and conditions. The above-referenced special use permit process also includes a category for temporary placement of objects on non-living substrate of submerged lands, which could be used for temporary moorings. For example, for temporary mooring buoys placed on non-living substrate for a marine event that would require access to the sanctuary.

All other regulations would be the same as the existing GFNMS regulations, including DOD exemptions and vessel desertion provisions.

Sanctuary Management Plan Amendments

For the most part, the existing relevant provisions of the sanctuary management plans would be applied to the expansion area. NOAA is currently developing a programmatic NEPA analysis for West Coast regional field operations, many of which are designed to implement activities described in management plans, such as strategies to reduce ship strikes of whales or field research. The vast majority of activities presented in the CBNMS and GFNMS management plans would not have an impact on the environment because they are administrative in nature or occurring in existing facilities; however, any potential impacts of actually implementing the management plans would be considered in this other programmatic NEPA action. The management plans include the following programs and activities.

CBNMS

Proposed updates to the CBNMS management plan include: revisions to the description and map of CBNMS; technical corrections, including removal of obsolete text and completed actions and inclusion of additional language relevant to the expanded sanctuary area; renaming the Ecosystem Protection Action Plan the Resource Protection Plan; moving the enforcement, emergency response and regulations and permitting activities from the Administration Action Plan to the Resource Protection Plan; adding an activity regarding ship strikes of whales to the Resource Protection plan; adding an activity to encourage and assist agency and port, harbor and marina management entity efforts to improve availability and use of vessel wastewater pumpout facilities and dump stations to the Resource Protection Plan; adding an activity to evaluate specific previously proposed research activities to the Conservation Science Plan; summarizing key partners at the action plan and cross-cut action plan level rather than at the strategy level; deletion of specific products; revision of action plan former timelines and budgets into a summary implementation table in the Administration Action Plan; and updates to the species list appendix.

Activities are also proposed to be added to the cross-cut action plans for CBNMS, GFNMS and MBNMS related to management of the expansion area to ensure effective marine science, outreach, resource protection, staffing and budget allocations.

GFNMS

Proposed updates to the GFNMS management plan include: revisions to the description and boundary map; updated maps in the Wildlife Disturbance and Vessel Spills action plans; technical corrections, including removal of obsolete text and completed actions and extension of relevant actions plans to the expanded sanctuary area; adding activities regarding climate change, working to encourage and assist relevant agencies and entities to improve availability and use of vessel wastewater pumpout facilities and dump stations, white shark stewardship, ship strikes and monitoring of whales, and wildlife protections in the expansion area; deletion of specific products; revision of former timelines and budgets into a summary implementation table, and updates to the species list appendix.

The same activities proposed to be added to the cross-cut action plans in the CBNMS management plan, as mentioned above, would also be added to the cross-cut action plans in the GFNMS management plan.

3.3 No Action Alternative

Evaluation of a No Action alternative is required under NEPA. The No Action alternative is equivalent to the status quo, with regard to sanctuary boundaries and regulations. No boundary adjustments would be made to include additional north central coast waters and no changes would be made to existing regulations or the terms of designation for either sanctuary. All management practices currently occurring in the north coast offshore area would continue. The No Action alternative would involve continuing to implement the current management plans and regulations for the two sanctuaries. Future development and activities in the proposed expansion area would be subject to existing federal and state regulations. No added protection of biological resources, water quality or cultural resources would be provided and the various educational and monitoring programs outlined in the sanctuary management plans would not be implemented in the proposed expansion area.

3.4 Alternative – Application of Existing Sanctuary Regulations

This alternative differs from the proposed action only in the application of regulations. This alternative is similar to the proposal outlined in the Federal Register notice issued for scoping of this EIS.

Description of Boundary

The boundaries of each sanctuary would be the same as described for the proposed action.

Regulations

In this alternative, all relevant existing regulations for both GFNMS and CBNMS would be applied to their expanded boundaries. There would be no changes in regulations from those currently in effect. The differences from the proposed action are summarized as follows for each sanctuary. Existing sanctuary regulations are available for review at the following websites:

- GFNMS Regulations: http://www.ecfr.gov/cgi-bin/retrieveECFR?gp=1&SID=1ed1e0cad259465dbc99453a53d8937e&ty=HTML&h=L&n=15y3.1.2.2.12.8&r=SUBPART
- CBNMS Regulations: http://www.ecfr.gov/cgi-bin/retrieveECFR?gp=1&SID=1ed1e0cad259465dbc99453a53d8937e&h=L&n=15y3.1.2.2.12&r=PART&ty=HTML%2315:3.1.2.2.12.11#15:3.1.2.2.12.11
- ONMS Regulations for all sanctuaries and for sanctuary-specific regulations: http://www.ecfr.gov/cgi-bin/retrieveECFR?gp=&SID=1ed1e0cad259465dbc99453a53d8937e&r=PART&n=15y3.1.2.2.12

CBNMS

- There would be no authorization process to allow certain otherwise prohibited activities that are approved pursuant to a valid Federal, state or local lease, permit, license, approval or other authorization mechanism.
- There would be no exemption for clean graywater discharges.
- Regulations would not include a prohibition regarding possessing, moving, removing, or injuring historical resources.
- The prohibition against interfering with an enforcement action, as described for the proposed action, would not be included in this alternative.
- Permit procedures would not be modified to clarify that the regulations prohibit in all cases the issuance of national marine sanctuary permits for oil, gas or mineral exploration, development, or production. However, oil and gas facilities would be clearly listed as prohibited activities, as in the current regulations.

GFNMS

- The existing exemption for oil and gas pipelines in GFNMS would remain, as described in the existing regulations, which would allow pipelines under specific conditions (see below).
- As in CBNMS, there would be no exemption for clean graywater discharges.
- GFNMS would utilize the existing approval process (referred to as certification process in 15 CFR 922.84) without modification and would not establish an authorization process to allow additional certain otherwise prohibited activities. As described above, the current process allows the Sanctuary to issue a permit, license, or other authorization allowing the laying of any pipeline related to hydrocarbon operations in leases adjacent to the sanctuary and placed at a distance greater than 2 nm from the Farallon Islands, Bolinas Lagoon, and any ASBS. The authority is limited to this type of pipeline and would not allow for the approval of new cables, discharges or other human activities that may be permitted by other agencies after the sanctuary is expanded.
- Existing permits and leases for uses and activities such as cables, Bodega Marine Lab discharge, construction and maintenance of piers or docks could potentially be authorized or “certified” at the time that the sanctuary expansion took place, pursuant to existing national marine sanctuary program regulations (15 CFR 922.47). This would allow for the continuation of these uses in the sanctuary.

- MPWC operation would be prohibited in the expansion area, as it currently is prohibited within the existing GFNMS, without any zones where MPWC operation would be allowed, except when necessary for rescue/safety activities conducted by appropriate public safety agencies, as provided in the existing regulations.

- Cargo vessel prohibition areas would be designated within an area extending 2 nm from the existing ASBSs in the expansion area: Saunders Reef, Del Mar Landing, Gerstle Cove and Bodega (see Figure 3.4-1) rather than establishing Special Wildlife Protection Zones, as described for the proposed action Cargo vessel prohibition areas in the existing sanctuary would continue as they currently exist; no changes to their configuration within the existing sanctuary boundaries would occur.

- Low overflight prohibitions would be designated within an area extending one nm at the four ASBS in the expansion area (see Figure 3.4-2). Low overflight prohibitions in the existing sanctuary would continue as they currently exist; no changes to their configuration within the existing sanctuary boundaries would occur.

- Regulation of uses at Arena Cove would differ from the proposed action due to the absence of the proposed authorization provision. There would be no mechanism to allow the issuance of an authorization for prohibited activities such as the discharge of fireworks since the authorization provision is only included in the proposed action; it is not in the existing GFNMS regulations. However, the discharge of fireworks could be allowed under a special use permit from the sanctuary superintendent. Pre-existing mooring leases, permits, or licenses could be certified, as described for the proposed action, under the national marine sanctuaries program regulations (15 CFR 922.47). GFNMS could permit new moorings under the permit authorities in Section 922.83(b), which would be limited to the scope of the authorities: further research or monitoring related to Sanctuary resources and qualities; further the educational value of the Sanctuary; further salvage or recovery operations; or to assist management of the sanctuary. GFNMS could issue a permit to allow new moorings for personal use under the authority to assist in the management of the sanctuary if there was a mooring plan similar to the plan developed for Tomales Bay and adopted by State Lands Commission, the California Coastal Commission and/or other Federal, State, or local authorities of competent jurisdiction. As with the proposed action, Sanctuary consideration to allow this activity would require State Lands Commission, the California Coastal Commission and/or another Federal, State, or local authority of competent jurisdiction to apply for a sanctuary permit to assist in the management of the sanctuary, subject to terms and conditions. Until such a plan was developed, GFNMS regulations would not allow permitting of new moorings for personal use.

- As with CBNMS, the following changes outlined in the proposed action would not be implemented:

  - The prohibition against interfering with an enforcement action would not be included in this alternative.

  - Permit procedures would not be modified to clarify that the regulations prohibit in all cases the issuance of national marine sanctuary permits for oil, gas or mineral exploration, development, or production. However, oil and gas facilities would be clearly listed as prohibited activities, as in the current regulations.

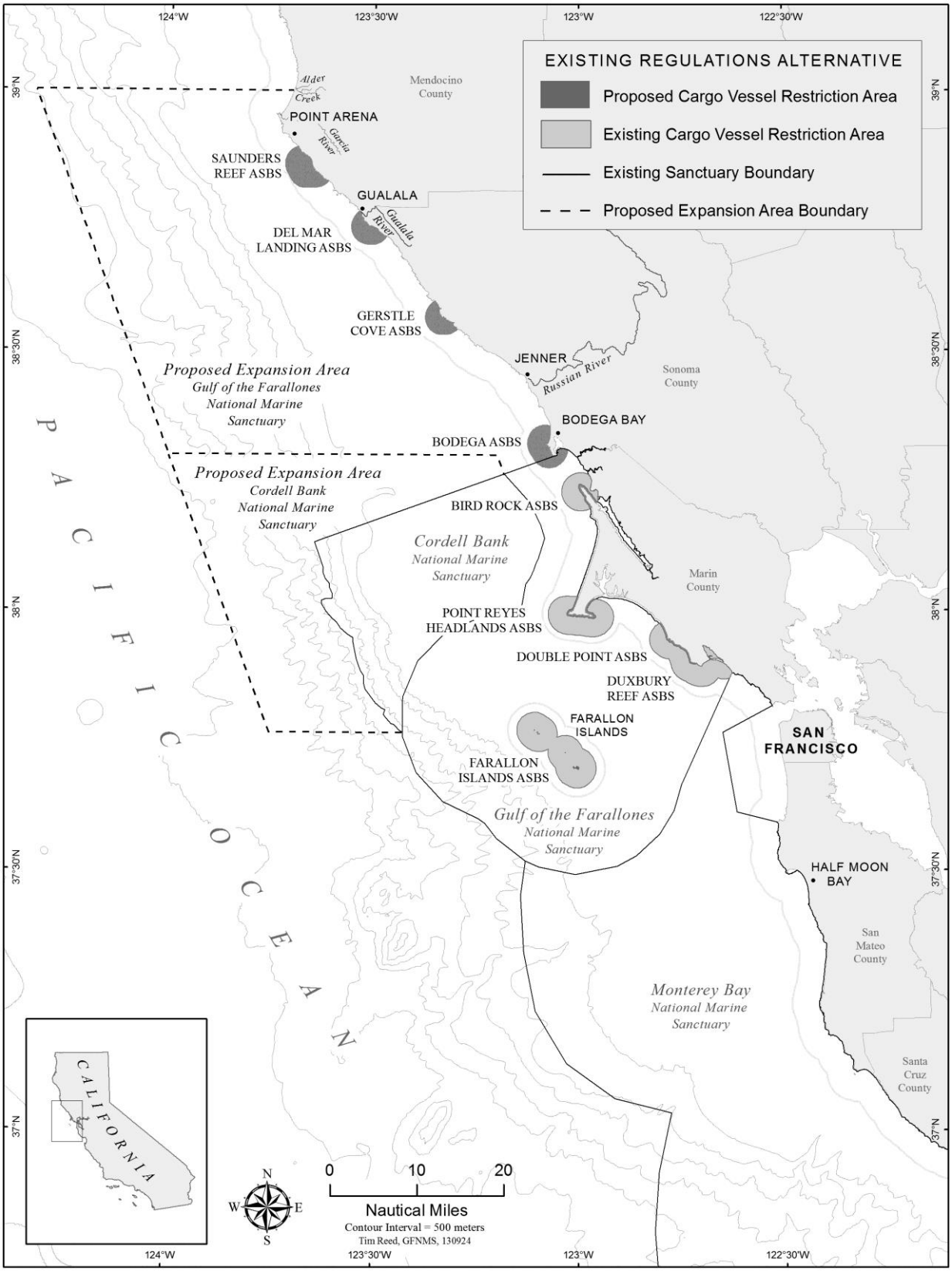

Figure 3.4-1. Existing Regulations Alternative – Cargo Vessel Prohibition Areas

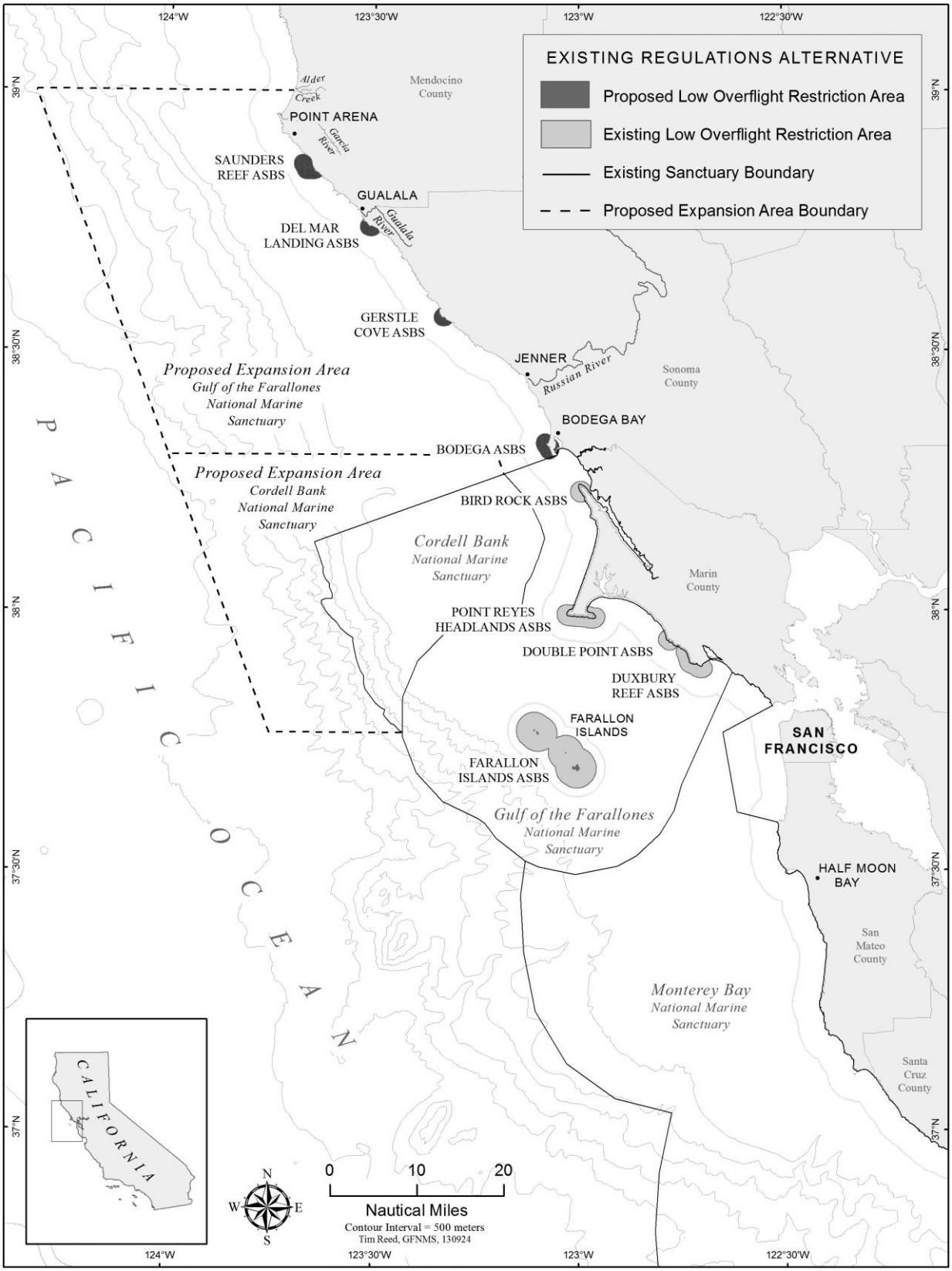

Figure 3.4-2. Existing Regulations Alternative – Low Overflight Restriction Areas

Sanctuary Management Plan Amendments

The CBNMS and GFNMS management plans would be the same as the proposed action. There would be no changes to the GFNMS Wildlife Disturbance Action Plan if this alternative is chosen because each of the strategies focus on outreach, education, monitoring and enforcement of wildlife disturbance incidents throughout the waters of the sanctuary. Each of these strategies would apply whether ASBS or SWPZs are used to establish cargo vessel prohibition areas and overflight restrictions.

3.5 Arena Cove Boundary Alternative

This alternative provides an option for including all of Arena Cove within the GFNMS boundary. This differs from the proposed action in that the proposed action excludes the existing pier and waters east (shoreward) of the pier.

Description of Boundary

The boundary would extend to the Arena Cove mean high water line (MHWL) on the shore and would include docks, a pier and all moorings in Arena Cove.

Regulations

This boundary option could be implemented with either the proposed action targeted regulations (see Section 3.2) or with the existing sanctuary regulations alternative (see Section 3.4). However, if it is included in the existing regulations alternative, the absence of an authorization process (as described for the proposed action) would mean that GFNMS would not have that as a mechanism to authorize other agency approvals for certain uses within the cove. The differences between the proposed action (targeted regulations) and existing regulations alternative regarding the regulation of known uses in Arena Cove are summarized as follows:

- For the proposed action (targeted regulations) – As described in Section 3.2, if fireworks are an activity authorized by any lease, permit, license, approval, or other authorization from another agency, then GFNMS could allow this activity under the proposed action authorization process that would require a Federal, State, or local authority to apply for Sanctuary authorization.

  Similarly, if personal use vessel moorings within the boundary of the sanctuary are authorized by State Lands Commission, the California Coastal Commission and/or other Federal, State, or local authorities, then the Sanctuary could allow this activity under the authorization process included in the proposed action. Also, as described for the proposed action, existing permits for uses and activities in the expansion area such as fireworks or construction and maintenance of piers or docks could be "certified" at the time that the sanctuary expansion takes place, pursuant to existing national marine sanctuary program regulations (15 CFR 922.47). This certification would allow for the continuation of these uses in the sanctuary.

  GFNMS could issue a permit to allow new moorings for personal use under the authority to assist in the management of the sanctuary if there was a mooring plan similar to the plan developed for Tomales Bay and adopted by State Lands Commission, the California Coastal Commission and/or other Federal, State, or local authorities of competent jurisdiction. As with the proposed action, Sanctuary consideration to allow this activity would require State Lands Commission, the California Coastal Commission and/or another Federal, State, or local authority of competent jurisdiction to apply for a sanctuary permit to assist in the management of the sanctuary, subject to terms and conditions.

All activities related to the construction, repair or maintenance of the pier that have the potential to discharge any material or other matter or place any structure on the submerged lands of the Sanctuary would be prohibited. However, if pier construction or maintenance activities were authorized by any lease, permit, license, approval, or other authorization from another agency, then the Sanctuary could authorize these facilities through the authorization provision in the proposed action.

- For the existing regulations alternative – As described in Section 3.4, if current Sanctuary regulations were applied, existing permitted uses and activities could be certified at the time that the sanctuary expansion takes place, pursuant to existing national marine sanctuary program regulations (15 CFR 922.47). This certification would be the same as for the proposed action and would allow for the continuation of these uses in the sanctuary. There would be no mechanism to allow the issuance of an authorization for new uses that fall under the list of prohibited activities. Existing vessel moorings at Arena Cove that would be within the boundary of this alternative would be subject to sanctuary regulations. These moorings could possibly be allowed through a national marine sanctuary permit, or if these moorings are currently permitted by another agency at the time of sanctuary expansion (as described in Section 3.4), then the nationwide certification process could be used to allow them. The permit process would require State Lands Commission, the California Coastal Commission and/or another Federal, State, or local authority of competent jurisdiction to apply for a Sanctuary permit to assist in the management of the sanctuary, subject to terms and conditions.

  All activities related to the construction, repair or maintenance of the pier that have the potential to discharge any material or other matter or place any structure on the submerged lands of the sanctuary would be prohibited. Even if these activities were authorized by a lease, permit, license, approval, or other authorization from another agency, there would be no mechanism to permit or authorize them under the existing sanctuary regulations.

Sanctuary Management Plan Amendments

The GFNMS management plan under this alternative would be the same as the proposed action. Specific geographic areas associated with Arena Cove are not addressed in the management plan. This alternative does not affect the CBNMS management plan; it would be the same as the proposed action.

3.6 Alternative MPWC Zones

This alternative provides different boundaries for two of the proposed MPWC zones (see Section 3.2) in the GFNMS expansion area, as described below. There are two alternatives for MPWC Zone 2 and one alternative for Zone 4. The regulations and management plan would be the same as described for the proposed action.

- Zone 2A (From Arena Cove to Havens Neck) (Area 19.8 sq nm) – This zone differs from the proposed action Zone 2 in size of the area and shape of the nearshore boundary (see Figure 3.6-1). It would create an offshore buffer of 1000 feet to keep MPWC away from the nearshore environment. It would allow for access closer to coves between Moat and Saunders Landing, and between Iversen Landing and Haven's Neck, and would be 0.2 sq nm larger than Zone 2 in the proposed action. In this alternative, a GPS unit could not be used for compliance with the nearshore boundary. However, this is an area with a rocky coastline, steep cliffs and powerful wave conditions, so MPWC users would generally stay this distance from shore, except when accessing the area from Arena Cove.

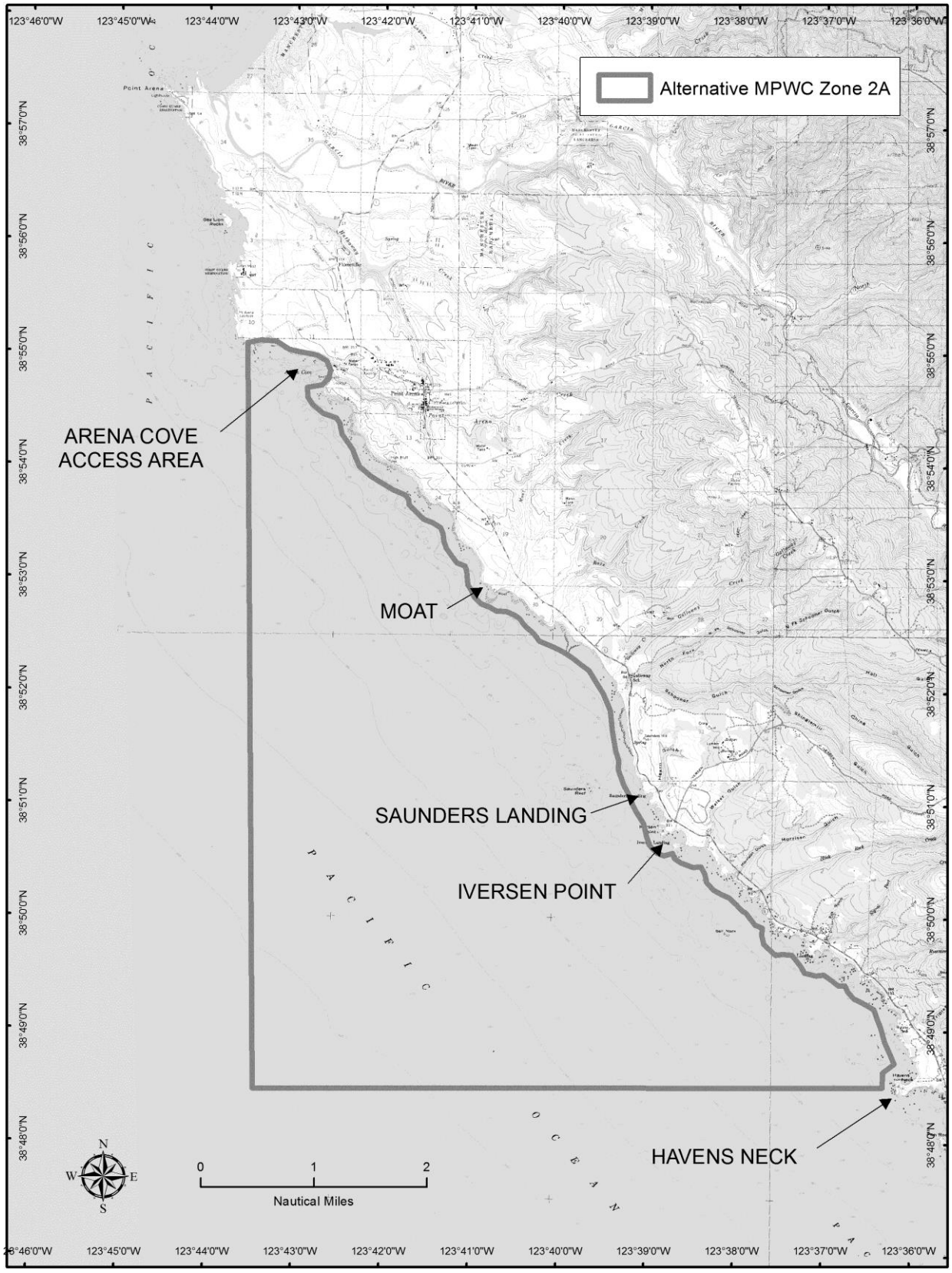

Figure 3.6-1. Alternative MPWC Zone 2A

- Zone 2B (From Arena Cove to Havens Neck) (Area 21.5 sq nm) – This zone also differs from the proposed action Zone 2 in size of the area and shape of the nearshore boundary (see Figure 3.6-2). Its boundary would go to the MHWL and would be 1.9 sq nm larger than Zone 2 in the proposed action. There are some areas in Zone 2B where wildlife can rest or roost on rocks when the weather or tides allow, which could potentially cause a disturbance. However, the rocky coastline, steep cliffs and powerful wave conditions will generally keep MPWC users out of the nearshore, except when accessing the area from Arena Cove. This option would also allow MPWC users to land their craft at the two small beaches in this zone, in areas where there is not known breeding seabird colonies or pinniped pupping sites. GPS units can be used for compliance with this zone.

- Zone 4A (From Bodega Head to Duncan's Point) (Zone Area 4.3 sq nm; Access Area 0.3 sq nm) – This zone differs from the proposed action Zone 4 in shape and size of the boundary and area (see Figure 3.6-3). A 100-yard access route from Bodega Harbor to Zone 4A using the Harbor entrance and two navigational buoys would be the only allowed entrance to the zone. To further minimize the potential for nearshore impacts on wildlife, it would not allow access from Salmon Creek, Bean Avenue or the Ranger Station at Sonoma Coast State Beach. It would be smaller in size than proposed Zone 4, but would allow access farther north to Duncan's Point, a prominent landmark. Waypoints on GPS units would have to be used to ensure compliance with the eastern boundary of the zone from the north end of Carmet Beach to Duncan's Point.

3.7 Other Alternatives Considered and Eliminated

As described in Section 3.1, numerous boundary alternatives were suggested during the scoping process. In addition, suggestions were made regarding alternative regulations that could be applied to the proposed sanctuary expansion area. These boundary and regulatory modifications were carefully considered but eventually dismissed as the project team focused on alternatives that best achieved the purpose and need of the proposed action.

A range of potentially reasonable alternatives was considered. Alternatives considered but eliminated are described below. These alternatives were proposed by the public, Sanctuary Advisory Council members, or staff. These alternatives were rejected for various reasons, including lack of feasibility, relevance to the purpose and need, the ability to address the particular issue within the scope of existing authority, or the need for more analysis beyond the scope of the current process. For these reasons, these regulations or boundary alternatives were dismissed from further consideration.

Nearshore Sanctuary with Targeted Protections

NOAA (ONMS) considered a boundary alternative that included the same overall area as the proposed action, but instead adjusted boundaries significantly between Cordell Bank and Gulf of the Farallones national marine sanctuaries, such that all waters in the proposed expansion area beyond 12 nm from land would be moved into CBNMS. Public comment received during the public scoping period suggested some form of this alternative should be considered. This alternative was initially evaluated but rejected from detailed consideration because it did not offer significant benefits to meet the overall project objectives.

Moreover, this alternative would have resulted in an even more complicated regulatory adjustment, as site regulations necessary only for GFNMS would have been required for CBNMS — such as the authority to

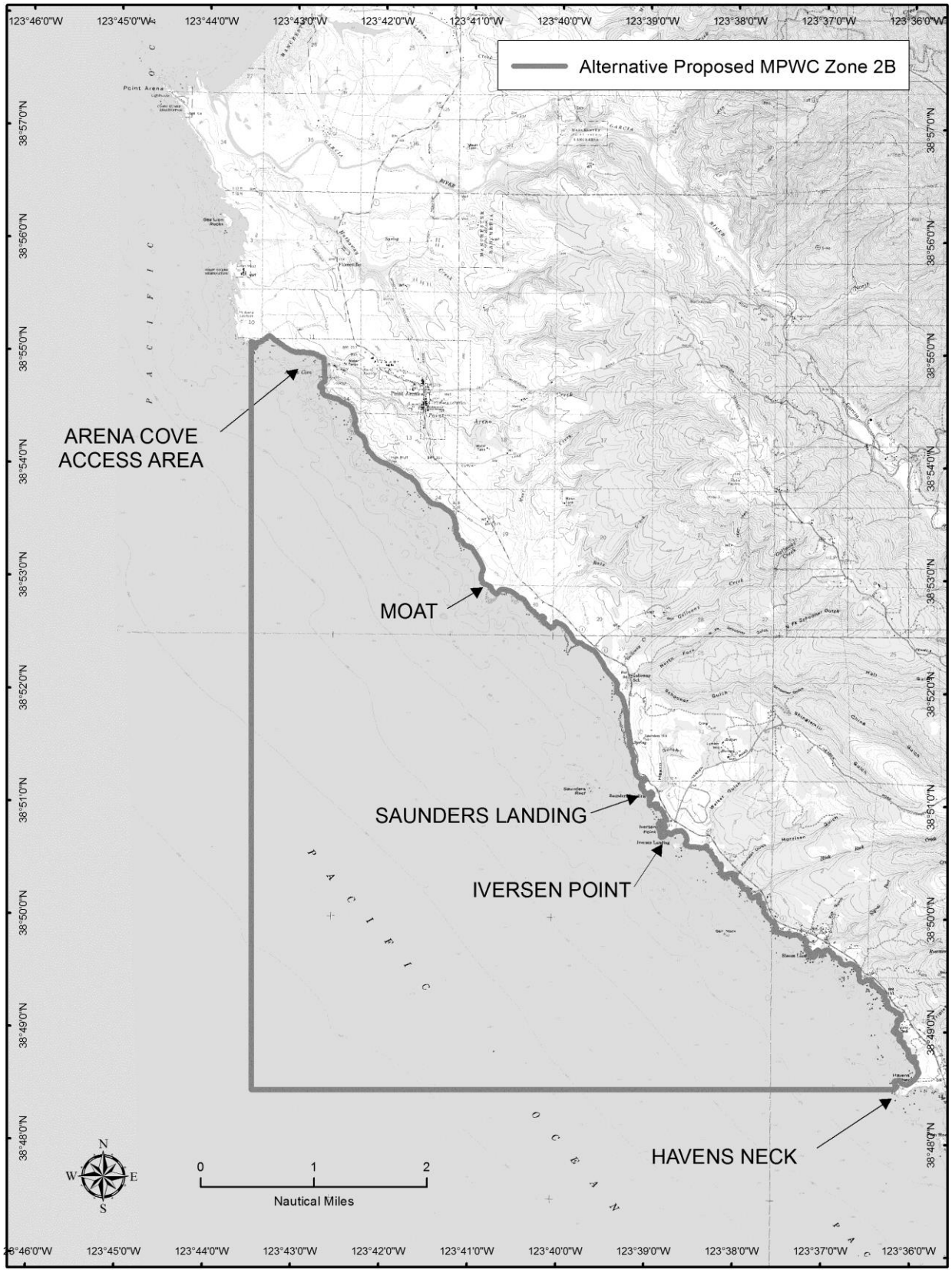

Figure 3.6-2. Alternative MPWC Zone 2B

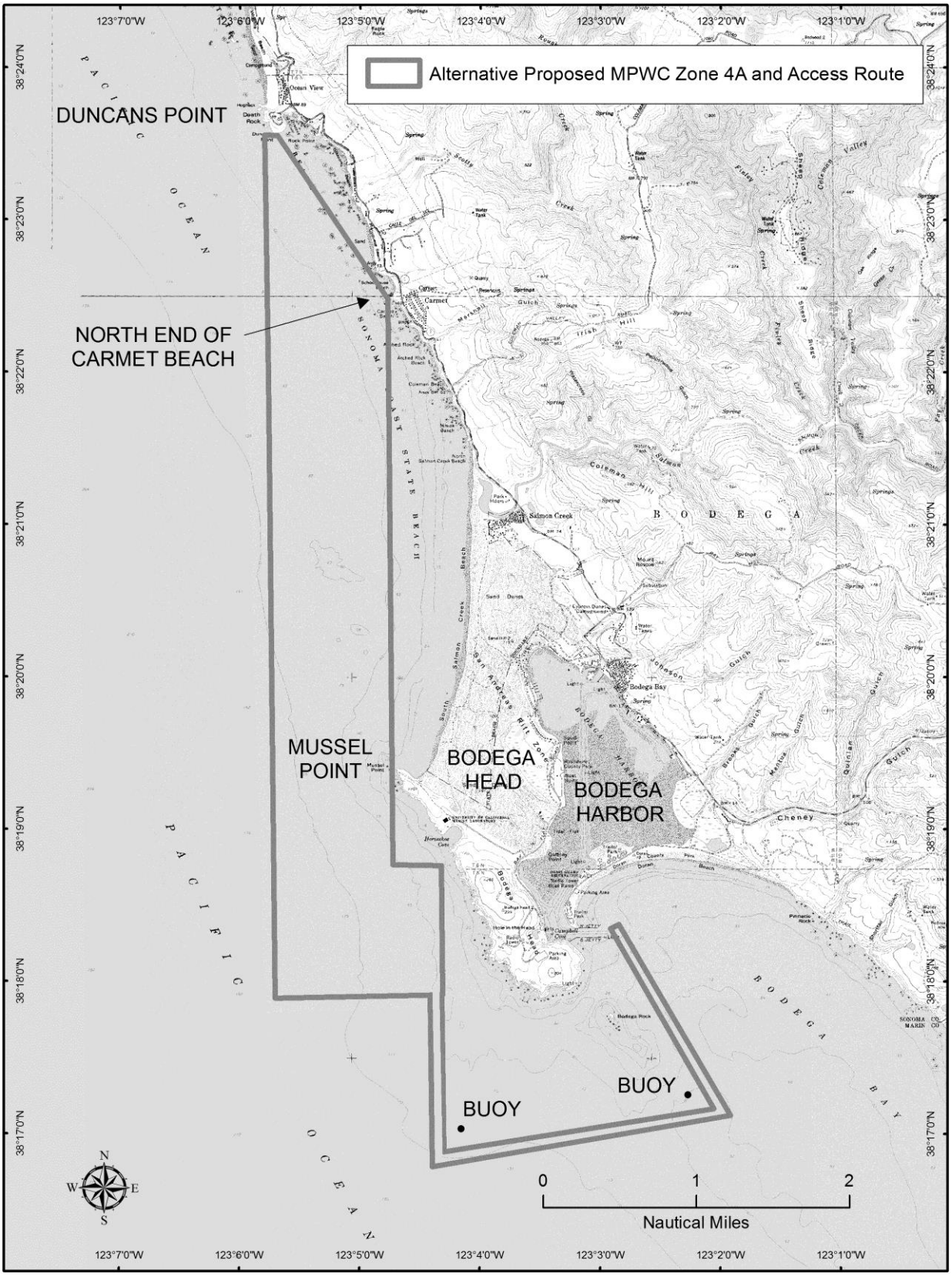

Figure 3.6-3. Alternative MPWC Zone 4A

regulate operating a vessel within the sanctuary and a regulation prohibiting the operation of a motorized personal watercraft. NOAA believes CBNMS has a specific identity linked to the bank itself and the immediately adjacent waters of Bodega Canyon, which would be included in the proposed CBNMS boundary expansion. Expanding CBNMS over 50 miles to the north would diminish the agency's capacity to focus science, management, and education and outreach on Cordell Bank and its immediately adjacent habitats and resources, whereas the GFNMS management already has the experience and expertise required to address many nearshore activities and concerns.

Should the boundaries of both sanctuaries be expanded with this action, ONMS will evaluate if there are benefits to having CBNMS assume a more active role in managing some aspects of the offshore waters of the expanded GFNMS. CBNMS staff and management have particular expertise in studying, managing and carrying out public outreach educating the public about offshore sanctuary resources in the region. CBNMS also largely has considerable expertise in conducting offshore ecosystem monitoring in the existing sanctuary areas. Such an informal arrangement could have more benefits (and be less complicated from a regulatory standpoint) than the formal alternative with significant boundary adjustments mentioned above. Furthermore, ONMS has been successful with a similar arrangement whereby GFNMS manages a northern portion of MBNMS.

Reduced Area

In order to assess the full range of potential alternatives, a smaller sanctuary boundary expansion for GFNMS was considered. This alternative would include only a portion of the oceanic upwelling cell identified in the proposed action. Because the purpose and need is focused on protection of the entire ocean upwelling cell as a unit, this alternative was eliminated from further evaluation.

Larger Boundary Area to the North

Numerous scoping comments suggested expanding the sanctuaries to include a larger area to the north. Several public comments suggested extending the northern boundary to include all of Mendocino County and parts or all of the waters bordering Humboldt County. Other suggestions ranged from including all offshore waters up to Oregon or along the entire Pacific Northwest, from Sonoma County north to Canada or Alaska. These alternatives go beyond the specified purpose and need of the proposed sanctuary expansion because they extend far beyond the geographical area of the upwelling unit that this action is meant to address. Incorporation of these large areas would not be feasible, given existing sanctuary programs and staffing. Furthermore, there are separate processes for establishing new sanctuaries or marine national monuments that could be utilized in these areas in the future to protect their ecological characteristics distinct from those of GFNMS and CBNMS. Under the 1972 Marine Protection, Research and Sanctuaries Act, the Secretary of the Department of Commerce is authorized to designate discrete areas of the marine environment as national marine sanctuaries to promote comprehensive management of their special conservation, recreational, ecological, historical, research, educational, or aesthetic resources. The Congress can also designate national marine sanctuaries.

NOAA ONMS issued a Federal Register Notice on June 28, 2013 for a proposed rule regarding re-establishing the sanctuary nomination process. In summary, this rule would amend ONMS regulations governing the process for nominating and evaluating sites for eligibility for national marine sanctuary designation. Following issuance of the final rule, NOAA may begin accepting new sanctuary nominations.[9]

[9] For additional information, see Federal Register Volume 78, No. 125, Friday, June 28, 2013, Proposed Rules, Department of Commerce, NOAA, 15 CFR Part 922, "Re-establishing the Sanctuary Nomination Process."

Inclusion of the Russian River Inland Area

Suggestions were made to include the tidally influenced portions of the Russian River and estuarine area within the sanctuary boundaries. While other tidally influenced areas of GFNMS are included in the existing sanctuary such as Bolinas Lagoon and Tomales Bay, there are numerous complex resource management issues within the Russian River being handled by other agencies, including NMFS. It is not clear at this time that adding the sanctuary's regulatory authority to the tidally influenced portions of the river would lead to any greater resolution of those issues and could detract limited sanctuary staff resources from other priorities where sanctuary protection would clearly add value.

Exclusion of Arena Cove

Suggestions were made to exclude from the expansion a far larger area of Arena Cove for any boating and recreational related facilities and activities in Arena Cove that may otherwise be inconsistent with Sanctuary regulations. Some members of the public expressed concern about sanctuary regulations causing potential constraints on the uses and facilities within the cove.

To exclude the entire Arena Cove and the recreational and harbor uses and facilities within it would be inconsistent with sanctuary boundaries drawn in other coastal areas where anchorages exist. In addition, it is not necessary to exclude the area from the expanded sanctuary in order to allow most activities and uses of facilities to continue. This alternative was eliminated because, under the authorization provision of the proposed action, GFNMS could allow existing or proposed uses, such as seasonal anchorages and fireworks by authorizing permits from the California Coastal Commission or other agencies specified in the authorization provision. The proposed project nonetheless excludes a portion of Arena Cove out to and adjacent to the existing pier.

Southern Boundary Extensions

Suggestions were made to include the area known as the "donut hole" or San Francisco–Pacifica Exclusion Area into the proposed expansion area. This area is currently being considered for inclusion in Monterey Bay National Marine Sanctuary waters under a separate proposed rule; see http://farallones.noaa.gov/manage/exclusion_area.html. Other scoping comments recommended extending the sanctuary south all the way to Mexico. Extending existing sanctuaries to the Mexico border is infeasible and is not consistent with the purpose and need for the proposed action. Furthermore, a substantial amount of the coastal area extending from San Francisco to southern California is already designated as national marine sanctuary.

Alternative Regulations

For several particular issue areas, requests were made to develop specific exemptions or other regulations, different from what is in the current sanctuary regulations, or in addition to current regulations. Each of these requests was carefully considered by sanctuary staff. Several "targeted" regulations have been incorporated into the proposed action, as described in Section 3.2.

Chapter 4

AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

4.1 Introduction

This chapter provides the NEPA-required analysis of the physical, biological, social and economic issues associated with the proposed action. This introductory subsection is followed by issue-specific analyses of the potential effects of the proposed action and alternatives. Pursuant to the provisions of NEPA, the term effects (or impacts) includes "ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historic, cultural, economic, social, or health, whether direct, indirect, or cumulative. Effects may also include those resulting from actions which may have both beneficial and detrimental effects, even if on balance the agency believes that the effect will be beneficial" (CEQ Section 1508.8).

4.1.1 Chapter Overview/Format

This chapter includes an overview of the baseline physical, biological, social, and economic conditions that occur within the study area of the proposed action (the potentially "affected area" for a particular resource), and analyzes the environmental consequences of the proposed action (preferred alternative), the regulatory and boundary alternatives, and the No Action alternative. The proposed action includes the set of regulations that would apply to the existing and expanded boundaries of each sanctuary, as described in Chapter 3.

The chapter is organized by sections on each resource area or type of use that may be impacted by the proposed action or alternatives, as follows:

- Physical Resources (including air quality, climate change, geology, oceanography and water quality)
- Biological Resources
- Commercial Fishing and Aquaculture
- Cultural and Maritime Heritage Resources
- Socioeconomic Resources, Human Uses, and Environmental Justice
- Offshore Energy
- Marine Transportation
- Homeland Security and Military Uses

These subsections are also referred to as issue areas or topics. As applicable, each section includes a definition of the study area for the specific topic covered in the section, a general overview of relevant legislative and regulatory requirements governing the topic, and a discussion of the general conditions of the resource or use within the study area. Because the proposed action includes a series of separate regulatory actions that may not equally affect all areas of the sanctuaries, the focus of the affected environment description is on those resources or uses that may be affected by specific regulatory changes. As a result,

some sections, such as air quality, provide only a general discussion of the resource conditions, while the Biological Resources section provides a more specific discussion of the resources.

The second part of each section describes the methodology used for impact analysis and factors used to determine the significance of direct and indirect impacts (40 CFR 1508.8). Direct impacts are those that are caused by the proposed action and occur at the same time and place. Indirect impacts are those that are caused by the proposed action but occur later in time or are farther removed in distance from the proposed action. The overall methodology for each issue area or topic is consistent with CEQ guidance and NOAA NEPA guidelines (NAO 216-6).

The impact analysis for each issue area includes a description of how the proposed action results in a change in the environment relative to existing conditions and the current regulatory framework. The analysis within each topic focuses on components of the proposed or alternative actions that could result in potentially significant effects. Both adverse and beneficial impacts are identified, where relevant. Finally, the chapter concludes with a comparison of alternatives and discussion of the possible cumulative impacts the project may have when combined with reasonably foreseeable past, present, and future projects undertaken outside the scope of the proposed action.

4.1.2 Scope of Impact Analysis and Study Area

During the public scoping process, numerous issues were raised. These issues were carefully reviewed. To the extent that these issues were relevant to the EIS, they are included in the analysis. In some cases, the proposed expansion and implementation of sanctuary regulations do not affect these identified issues.

Only the background environmental and socioeconomic conditions relevant to the proposed action or alternatives are presented. Resource areas that have been determined to have no potential for impacts by the proposed action or alternatives are not discussed in this EIS. Regulatory changes that are technical in nature and minor technical wording changes that do not change the regulatory intent or compliance requirements and that will result in no direct or indirect impact on any resources in the study area are not discussed in the impact analysis. The analysis of the proposed changes to sanctuary terms of designation is incorporated in the analysis of related proposed regulations since it is the regulations, not the terms of designation, which could result in changes in the environment. Management plan actions that have no potential for impacts, such as administrative actions taking place in existing facilities, are not considered in this EIS. NOAA is currently developing a programmatic NEPA analysis for West Coast regional field operations, many of which are designed to implement activities described in management plans. The vast majority of activities presented in the CBNMS and GFNMS management plans would not have an impact on the environment because they are administrative in nature; however, any potential impacts of actually implementing the management plans would be considered in this other programmatic NEPA action.

Within each issue area, the impact analysis addresses only those elements of the proposed regulations that have the potential to impact the specific resource or use. Where there is no potential for a specific proposed regulation or activity to impact that resource or use, the regulation or activity is not discussed. Furthermore, the complexity of the impact analyses for the proposed action dictates which subheadings are used within individual topic or issue areas. While all resources and uses were considered, categories and subcategories are omitted if they were found to not be impacted by a proposed or alternative action.

The study area for the EIS varies by topic, but is generally the proposed sanctuary expansion area and adjacent shoreline. In some issue areas, the study area is necessarily larger than the proposed expansion area because there is potential for impacts to occur beyond the expanded boundaries, or for conditions outside the expanded boundaries to affect resources or uses within the proposed sanctuary expansion area. Also, there are several new regulations that apply to the existing sanctuaries that would have the potential to impact resources or uses within existing sanctuary boundaries. The nature of existing conditions in the proposed expansion area waters is interpreted from available literature, summarized in the resource sections. Where sufficient location-specific information is available, these data are primarily utilized. Where location-specific data are lacking, general conditions for the study area are utilized with appropriate qualifications. For proposed actions, the methodologies used to determine effects on the physical, biological and human environment are outlined in the individual topic sections.

4.1.3 Determining Significance of Impacts

To determine whether an impact is significant, CEQ regulations (40 CFR 1508.27) and NOAA guidance (NOAA Administrative Order [NAO] 216-6) require the consideration of context and intensity of potential impacts. Context normally refers to the setting, whether local or regional, and intensity refers to the severity of the impact. Also, an EIS should include a discussion of the possible conflicts between the proposed action and the objectives of federal, regional, state, and local land use plans and policies for the area concerned (40 CFR 1502.16 C).

Impacts are defined in the following categories:

- Significant;
- Significant but mitigable to less than significant;
- Less than significant;
- No impact; and
- Beneficial impact.

4.1.4 Resources/Issues Not Analyzed

Of the issues commonly analyzed in a NEPA process, the following list summarizes issues not analyzed in this EIS and the rationale as to why the proposed action or alternatives would not affect these resources.

- Noise – None of the alternatives would have the potential to allow new noise-generating activities that are not currently allowed in the expansion area under existing regulations. The proposed changes to the existing regulations would not affect noise generation within the existing sanctuary boundaries.
- Mineral Resources – There are no existing or planned mineral extraction uses in the proposed expansion area.
- Utilities – None of the alternatives would directly affect utilities or infrastructure. Alternative energy utilities are addressed in Section 4.7 (Offshore Energy). Undersea cables are addressed in Section 4.6 (Socioeconomic Resources, Human Uses and Environmental Justice), under land use and development.

- Visual Resources – None of the alternatives will impact visual resources. If a visitor center or sanctuary office is proposed onshore adjacent to the expansion area in the future, it would be subject to a separate review process. Since no location has been identified for such a facility, it would be speculative to attempt to address it in this EIS.

In addition to the resources listed above, numerous resources discussed in Sections 4.2 through 4.9 will not be impacted by any of the alternatives. These resources are included in the analysis to provide the public with a complete picture of the proposed expansion area.

4.2 Physical Resources

This section addresses air quality, climate, geologic, oceanographic and water quality issues related to the proposed actions. The existing climate, meteorology, air quality, geologic, oceanographic and water quality conditions of the region are generally described, and a summary of federal, State, and local authorities pertaining to these resources is provided. The impact analysis presents the standards used to evaluate impacts on physical resources and addresses potential effects of the proposed actions on each resource.

4.2.1 Regional Overview of Affected Environment

The following regional overview is divided by physical resource topic.

Air Quality and Climate

The study area for the air quality analysis varies according to the type of air pollutant being discussed; some pollutants, such as carbon monoxide, have a localized area of effect, while other pollutants, such as ozone, have a regional area of effect. The federal Clean Air Act requires EPA to set National Ambient Air Quality Standards for six common air pollutants. These commonly found air pollutants (also known as "criteria pollutants") are particle pollution (often referred to as particulate matter), ground-level ozone, carbon monoxide, sulfur oxides, nitrogen oxides, and lead. These pollutants are called "criteria" air pollutants because they are regulated by developing human health-based and/or environmentally based criteria (science-based guidelines) for setting permissible levels.

The main sources of air pollution come from diesel exhaust from ship engines, and from incineration of garbage on vessels. Vessel traffic within the sanctuaries contributes to the degradation of air quality. Diesel exhaust has a high sulfur content, producing sulfur dioxide, nitrogen dioxide, and particulate matter in addition to common products of combustion such as carbon monoxide, carbon dioxide, and hydrocarbons.

The proposed expansion area is located primarily within and adjacent to the North Coast Air Basin (NCAB), which has a southern boundary that coincides with the Sonoma/Marin County boundary at Estero Americano and extends north to the Oregon border. A portion of the expansion area is located adjacent to the San Francisco Air Basin (SFAB).

The summer climate of the West Coast is dominated by a semi-permanent high pressure cell centered over the northeastern Pacific Ocean. Because this high pressure cell is quite persistent, storms rarely affect the California coast during the summer. Thus the conditions that persist along the coast of California during summer are a northwest air flow and negligible precipitation. A thermal low pressure area from the Sonoran-Mojave Desert also causes air to flow onshore over the San Francisco Bay Area much of the summer.

The steady northwesterly flow around the eastern edge of the Pacific high pressure cell exerts a stress on the ocean surface along the west coast. This induces upwelling of cold water from below. Upwelling produces a band of cold water that is approximately 80 miles (69.5 nm) wide off San Francisco. During July the surface waters off San Francisco are 17°C (63°F), cooler than those off Vancouver, more than 700 miles (608 nm) farther north. See additional details regarding upwelling in the oceanography, water quality and biological resources sections.

Air approaching the California coast, already cool and moisture-laden from its long trajectory over the Pacific, is further cooled as it flows across this cold bank of water near the coast, thus accentuating the temperature contrast across the coastline. This cooling is often sufficient to produce condensation — a high incidence of fog and stratus clouds along the Northern California coast in summer.

During the winter season, the Pacific High weakens and shifts southward, upwelling ceases, and winter storms become frequent. Almost all of the Bay Area's annual precipitation takes place in the November through April period. Winter rains (December through March) account for about 75 percent of the average annual rainfall; about 90 percent of the annual total rainfall is received in the November-April period; and between June 15 and September 22, normal rainfall is typically less than 1/10 inch. During the winter rainy periods, inversions are weak or nonexistent, winds are often moderate, and air pollution potential is very low. However, there are frequent winter dry periods lasting over a week. It is during some of these periods that CO and particulate pollution episodes develop (BAAQMD 2004a).

The NCAB, which is just north of the SFAB, is comprised of three air districts, the North Coast Unified Air Quality Management District (AQMD), the Mendocino County AQMD, and the Northern Sonoma County Air Pollution Control District (APCD). The North Coast AQMD includes Del Norte, Humboldt, and Trinity Counties; the Mendocino County AQMD consists of Mendocino County; and the Northern Sonoma County APCD comprises the northern portion of Sonoma County. The attainment plans, rules and regulations, and criteria pollutant attainment status are different for each of the three air districts in the NCAB. The NCAB is characterized by moderately wet winters and dry summers with fog and low coastal clouds. Marine breezes from off the Pacific Ocean dominate the climate of the NCAB. Westerly winds predominate in all seasons but are strongest and most persistent during the spring and summer months. The extent and severity of the air pollution problem in the NCAB is a function of the area's natural physical characteristics (weather and topography), as well as human-created influences (development patterns and lifestyle). Factors such as wind, sunlight, temperature, humidity, rainfall, and topography all affect the accumulation and/or dispersion of pollutants throughout the NCAB area. In general, the air pollution potential of the coastal areas is relatively low due to persistent winds.

The SFAB is managed by the Bay Area Air Quality Management District (BAAQMD) and includes the counties of Alameda, Contra Costa, Marin, Napa, San Francisco, Santa Clara, San Mateo, plus portions of Solano and Sonoma Counties. The San Francisco Bay Area climate is similar to the NCAB in that it is characterized by moderately wet winters and dry summers.

The U.S. Environmental Protection Agency (USEPA) has established national ambient air quality standards (NAAQS) for ozone, nitrogen dioxide (NO_2), carbon monoxide (CO), sulfur dioxide (SO_2), 10-micron particulate matter (PM10), 2.5-micron particulate matter (PM2.5), and airborne lead. Areas with air pollution levels above these standards are considered "nonattainment areas" and are subject to planning and pollution control requirements that are more stringent than normal requirements.

In addition, the California Air Resources Board (CARB) has established standards for ozone, CO, NO_2, SO_2, sulfates, PM10, airborne lead, hydrogen sulfide, and vinyl chloride at levels designed to protect the most sensitive members of the population, particularly children, the elderly, and people who suffer from lung or heart diseases.

Both State and national air quality standards consist of two parts — an allowable concentration of a pollutant, and an averaging time over which the concentration is to be measured. Allowable concentrations are based on the results of studies of the effects of the pollutants on human health, crops and vegetation, and, in some cases, damage to paint and other materials. The averaging times are based on whether the damage caused by the pollutant is more likely to occur during exposures to a high concentration for a short time (one hour, for instance) or to a relatively lower average concentration over a longer period (eight hours, 24 hours, or one month). For some pollutants there is more than one air quality standard, reflecting both its short-term and long-term effects. The California ambient air quality standards are generally set at concentrations that are lower than the federal standards and in some cases have shorter averaging periods.

The entire NCAB is currently designated as nonattainment for the State 24-hour and annual average PM10 standards. The air basin is designated as unclassified for the State annual PM2.5 standard — available data are insufficient to support designation as attainment or nonattainment. Particulate matter has declined since the 1980s, primarily due to a changing industrial base, increased regulations regarding burning and enforcement of regulations (Mendocino AQMD 2005).

The SFAB is designated as a nonattainment area for the federal eight-hour ozone standard. Under the California Clean Air Act (CCAA), the basin is a nonattainment area for the State ozone standard. The Bay Area currently attains the national annual average and 24-hour standards for PM10, and the national annual average standard for PM2.5. USEPA changed the national 24-hour PM2.5 standard from 65 µg/m3 (micrograms per cubic meter) to 35 µg/m3 in 2006. Based on air quality monitoring data for the 2006-2008 period, which showed the Bay Area exceeding the revised standard by a small margin, the USEPA designated the Bay Area as non-attainment for the 24-hour national PM2.5 standard in December 2009. However, since that time, Bay Area PM2.5 levels have declined. Although the Bay Area is still officially designated as non-attainment, monitoring data for 2008-2010 shows that the Bay Area met the 24-hour national PM2.5 standard during this period (BAAQMD 2013). The Bay Area, like virtually all of California, is designated as nonattainment for the State PM10 standard. The Bay Area, like most urban areas, is also designated as nonattainment for the State PM 2.5 standard. The basin is classified as attainment or unclassified for the rest of the state and federal pollutant standards (BAAQMD 2013).

Climate Change

Climate is defined as the average statistics of weather, which include temperature, precipitation, and seasonal patterns such as storms and wind, in a particular region. Global climate change refers to the long term and irrevocable shift in these weather related patterns, including the rise in the Earth's temperature due to an increase in heat-trapping or "greenhouse" gases in the atmosphere. Using ice cores and geological records, baseline temperature and CO_2 data extends back to previous ice ages thousands of years ago. Over the last 10,000 years, the rate of temperature change has typically been incremental, with warming and cooling occurring over the course of thousands of years. However, scientists have observed an unprecedented increase in the rate of warming over the past 150 years, roughly coinciding with the global industrial revolution, which has introduced tremendous amounts of greenhouse gases into the atmosphere.

Unlike emissions of criteria and toxic air pollutants, which have local or regional impacts, emissions of greenhouse gases (GHGs) that contribute to global warming or global climate change have a broader, global impact. Global warming is a process whereby GHGs accumulating in the atmosphere contribute to

an increase in the temperature of the earth's atmosphere. The principal GHGs contributing to global warming are carbon dioxide (CO_2), methane (CH4), nitrous oxide (N_2O) and fluorinated compounds. These gases allow visible and ultraviolet light from the sun to pass through the atmosphere, but they prevent heat from escaping back out into space (BAAQMD 2013).

Among the potential implications of global warming are rising sea levels, and adverse impacts on water supply, water quality, agriculture, forestry and habitats. In addition, global warming may increase electricity demand for cooling, decrease the availability of hydroelectric power, and affect regional air quality and public health. Like most criteria and toxic air contaminants, much of the GHG production comes from motor vehicles and to a lesser extent motorized marine vessels. Climate change affects public health because the higher temperatures result in more air pollutant emissions, increased smog, and associated respiratory disease and heart-related illnesses.

Within and adjacent to the proposed expansion area, the coastal wetlands and rocky intertidal areas are threatened by sea level rise and cannot naturally move inland in some areas due to existing developments and resistant cliffs. This condition has the potential to threaten the region's fish species and may allow non-native species to thrive.

Geology and Oceanography

Geology

Geologic features in the study region include rocky shores, sandy beaches, islands, sea stacks, pinnacles, ridges, underwater canyons, the continental shelf, the slope, and the abyssal plain, which reaches depths of over 10,000 feet (3,000 meters). Bottom types on the continental shelf include sand and mud sediments, rocky outcrops, and reefs. Some of the unique features of the area include underwater canyons, tectonic features, and fossils. The project area is located on a plate boundary that separates the North American and Pacific Plates and is marked by the San Andreas Fault. This seismically active region experiences regular earthquakes, submarine landslides, turbidity currents, flood discharges, and coastal erosion.

The study area is tectonically active with the San Andreas fault running along the coast from Bodega to Point Arena and entering the ocean at Alder Creek, at the northern end of the proposed expansion area. Both sedimentary and metamorphic rocks occur on either side of the fault and in different nearshore areas along the coast. Rocks to the east of the fault are part of the North American Plate and those to the west, including Point Arena, are carried by the Pacific Plate. Most of the ocean area is on the Pacific plate. Sedimentary rocks are of the Franciscan complex, Great Valley Complex, and Salinian terrane (CDFG 2007). The unstable nature of many coastal cliffs has led to high rates of erosion (with average long term rates of approximately 10-30 cm/year) and some large scale landslides (Griggs and Patsch 2004). The coastal cliffs between Jenner and Fort Ross are constantly eroding and present challenges for maintaining the coastal highway.

Point Arena, at the north end of the study region, is a rocky peninsula on an elevated coastal plain in Mendocino County. Just north of Point Arena, the Garcia River empties into the ocean from a small estuary. The Gualala River enters the ocean about 18.6 miles south of Point Arena and forms a seasonal coastal lagoon behind a sandbar. The Sonoma coast is characterized by a relatively narrow shelf, a steep rocky coastline, and nearshore rocky reefs. The Russian River, which drains a very large watershed in Sonoma

and Mendocino Counties, meets the ocean at Jenner where a coastal lagoon forms seasonally behind a sandbar and a freshwater tidal plume extends from the coast during the wet season (CDFG 2007).

The coastline is comprised of sandy beaches, steep cliffs and marine terrace. The nearshore subtidal area contains soft bottom areas and extended areas of complex reef habitat. Many exposed rocks in the nearshore area are part of California Coastal National Monument (CCNM, managed by Bureau of Land Management [BLM]). Most of the larger sandy beaches are located toward the southern end of the proposed expansion area between Bodega and Jenner. North of Jenner, the coast is mostly rocky with isolated pocket beaches. North of Gualala, the coast is rocky, but there are some larger beaches south of Point Arena. At Bowling Ball Beach, part of Schooner Gulch State Beach, there are spherical "bowling ball" concretions which originate from the mudstone cliffs, many lined up the bedrock channels below the cliffs, which have been likened to "bowling lanes."

Bodega Canyon is a prominent submarine feature in close proximity to the northern boundary of the existing Cordell Bank National Marine Sanctuary. This seafloor feature, which is over 12 miles long and about one mile deep, cuts across the continental shelf and slope 3 to 6 miles north of the existing boundary of the sanctuary.

Submarine canyons provide areas of high bathymetric complexity, support deep water communities, and affect local and regional circulation patterns. Offshore canyons provide habitat for adult stages of rockfish and flatfish that rear in nearshore waters and move offshore in their adult stages (CDFG 2007). Limited work in Bodega Canyon has revealed mud-draped hard bottom on the canyon edges with some corals and fishes associated with the hard substrate (CBNMS unpublished report). In addition, offshore canyons and other bathymetric features are important foraging areas for seabirds and marine mammals (Yen et al. 2004).

Although the continental shelf is narrower in this region (about 17-28 miles wide or 15-25 nm), the shelf still comprises a significant portion of the proposed expansion area. The shelf break is defined as the 200-meter depth contour. Most of the shelf area is composed of soft bottom with occasional rock outcrops or deep reef features. The continental slope area is deeper than 200 meters and is primarily soft bottom with some hard bottom outcrops and ridge systems.

The following summary is excerpted from Shaw's (2007) geologic characterization of the area for the CCNM, which included field observations.

CCNM Subunit 11 Arena Cove to 39 degrees north – 8 mi

At Point Arena, Miocene marine deposits dip gently seaward and are overlain by thin Quaternary terrace deposits. Dune sand overlies all other deposits on the north end of the Point. Point Arena is 3 miles west of where the San Andreas Fault passes northwestward into the Pacific Ocean. Lower Miocene strata are exposed in cliffs that line the coast from Point Arena southward. The rocks consist of light tan colored mudstones and shales.

CCNM Subunit 12 Arena Cove to Gualala Point – 16 mi

Miocene and Cretaceous deposits are exposed along different segments of the coast between Arena Cove and Gualala Point. Pleistocene marine deposits overlie these units on wave cut terraces, which also are

believed to be of Pleistocene age. Basalt intrusive rocks of probable Tertiary age are exposed at Iverson Point. Miocene strata in Subunit 12 are similar to those exposed over much of the coast west of the San Andreas Fault. The rocks are light tan in color with very high microscopic porosity, making the rock very low in density. Rocks in the offshore shallows are relatively small north of Iverson Point. South of Iverson Point, Cretaceous rocks crop out at the shore and rocks become numerous and among the largest on the coast, as at Fish Rocks near Anchor Bay.

CCNM Subunit 13 Gualala Point to Fort Ross Reef – 30 mi

One mile south of the town of Gualala, at The Sea Ranch development, Paleocene strata intersect the coast and continue southward for a distance of approximately 4 miles. South of The Sea Ranch, the coast is bordered by Cretaceous strata for a distance of about 8 miles. A three-quarter-mile segment of the coast north of Black Point exposes Tertiary basalt in a small fault slice. Numerous rocks and pinnacles of the CCNM line the region offshore. These presumably are composed of the various hard strata associated with the Cretaceous. Paleocene and Eocene strata crop out along the coast for 20 miles to the south of Stewart's Point, ending one mile northwest of Fort Ross Reef. The remaining mile southeast of the termination of the Eocene outcrop consists of lower Miocene strata similar to that at Point Arena. At The Sea Ranch, south of Gualala, Paleocene strata underlie a wide terrace that ends at the ocean in steep cliffs. Numerous large, flat CCNM rocks are offshore. One of the largest is called Gualala Island and is mapped as Cretaceous. The Paleocene and Eocene outcrop belts produce numerous CCNM rocks and pinnacles of significant size and number. At the Fort Ross Reef, the lower Miocene forms the reef to which the name refers.

CCNM Subunit 14 Fort Ross Reef to the Bodega Point Peninsula – 70 mi

The Franciscan Formation lines the coast north and south of the Russian River. The rocks lie in the same belt as the Franciscan exposed near the Golden Gate Bridge in southern Marin County (Kleist 1981, Rice 1981). These include sandstones, greywacke sandstones, limestones, volcanic rocks and a matrix of clay mudstone (Kleist 1981, Rice 1981, Hall 1981). The Franciscan formation east of the San Andres Fault exposes strata that are somewhat different from that exposed west of the fault (Kleist 1981, Rice 1981, Hall 1981). West of the fault the Franciscan consists largely of metamorphosed basaltic lava flows (Kleist 1981). Metamorphism has produced greenstones rich in chlorite and epidote. Above the greenstones are banded cherts that alternate with black shales, both on the order of one inch thick, or less. The mouth of the Russian River lies eastward of the San Andreas Fault, which passes offshore at Bodega Head and reappears on land near Fort Ross Reef.

Oceanography

Much of the oceanography resources information was excerpted from the California Marine Life Protection Act Initiative Regional Profile of the North Central Coast Study Region (CDFG 2007). Additional information was excerpted from the JMPR EIS (NOAA 2008).

The study region is part of the California Current Large Marine Ecosystem (LME), one of only four temperate coastal upwelling systems in the world. The California Current LME is considered globally important for biodiversity because of its high productivity and the large numbers of species it supports (World Wildlife Fund 2000). The California Current LME extends from Vancouver Island to Baja California. It is a very productive ecosystem fueled by nutrient-rich upwelling of cold, deep ocean waters to

the surface. This upwelling of nutrients supports blooms of phytoplankton that form the foundation of a food web that includes many species of invertebrates, fish, marine mammals and seabirds. The study region is in the central part of the California Current LME and includes the entire scope of a strong and persistent upwelling center at Point Arena, which provides the source water for much of the productivity that occurs to the south. Because of effects related to coastal topography and ocean circulation, the Point Arena upwelling system is isolated oceanographically from the Cape Mendocino upwelling cell to the north. Circulation of surface water associated with upwelling at Cape Mendocino creates a relatively tight eddy between Cape Mendocino and Point Arena, and surface water is transported offshore north of Point Arena. Water upwelled at Cape Mendocino that is transported offshore rarely mixes with coastal waters that are south of the Point Arena upwelling center (Halle et al. 2010). The Point Arena upwelling center is strongly linked with areas to the south and analysis of ocean currents, water properties, and chlorophyll show a strong association between water upwelled at Point Arena and coastal water masses off southern Mendocino, Sonoma and Marin Counties (Halle and Largier 2011). Nutrients from the Point Arena upwelling center support a healthy and diverse assemblage of organisms including fishes, seabirds, and mammals that make this a biologically significant area in the northeast Pacific Ocean (NCCOS 2003). The cold, nutrient-rich waters flow from the upwelling center at Point Arena south along the southern Mendocino coast and entire Sonoma coast, deflect offshore at Point Reyes and flow out into the Gulf of Farallones. During the upwelling season, the surface waters are rich in nutrients that fuel a highly productive and diverse ecosystem, with large numbers of top predators that are dependent on this seasonal abundance of prey resources. The nutrients fuel a productive pelagic foodweb that includes phytoplankton, krill and other zooplankton, coastal pelagic species (anchovies, sardines, squid, etc.), sharks, other fish, seabirds and marine mammals. High local productivity also attracts many migratory species. High concentrations of phytoplankton and zooplankton from the Gulf of the Farallones and over Cordell Bank move north during periods of calm winds. When winds relax high levels of phytoplankton are observed repeatedly along the coast between Point Reyes and Point Arena (Largier 2013a). Relative to other parts of the state, this study region is very important to many species of top predators that are key components in the coastal and open ocean food webs. There are specific areas in the region that are important foraging and breeding grounds for populations of some top predators (Karl et al 2001; Yen et al 2004).

Major coastal rivers and streams also introduce freshwater, sediment, nutrients, and pollutants into near-shore waters. While typically localized in impact, and with strong seasonal variability, these features may dominate the oceanographic habitat in plume regions. The Russian River plume is the largest. Suspended sediment from the Russian River can extend up the shelf to Point Arena (winter deposition) while low-salinity effects due to the Russian River outflow can be seen as far south as Point Reyes in the early upwelling season (specifically, in years of late spring rains).

The oceanographic year can be broken into three seasons: upwelling season, relaxation season, and winter storm season. The upwelling season typically begins with the spring transition, characterized by strong persistent winds from the northwest. This usually occurs sometime in late February or early March, and is the start of the annual productivity cycle along north central California. During this season, upwelling driven by winds from the northwest alternates with periods of calm. These winds generally begin to subside by late July. August through mid-November is the relaxation season. During this time, winds are mostly light and variable, and the seas can be calm for one to two weeks at a time. This condition changes abruptly with the arrival of the first winter storms from the Gulf of Alaska. From late November through early

February, winter storms create large waves and strong winds along the coast. Physical processes operating on different temporal and spatial scales drive hydrodynamics along this section of the coast. Toward mid-November, the Davidson Current flows counter, e.g. northward, to the California Current, bringing warmer water at the surface. Like the oceanic period, nearshore eddies also characterize this phase in many places. Northward flowing waters function as the dominant inshore transporter of suspended nutrients. Southwest winds and other physical forces drive Davidson Current waters shoreward so as to displace coastal waters and induce downwelling.

Longer-term oceanographic variations also occur in the region, including sporadic El Niño Southern Oscillation events, Pacific Decadal Oscillation, and global warming. These phenomena affect local physical and biological systems. In the north central coast region of California, El Niño Southern Oscillation events are marked by the warming of nearshore waters due to equatorial Pacific trade winds relaxing. The onshore and northward flow increases, and coastal upwelling of deep, nutrient-rich water diminishes. Pacific Decadal Oscillation events are known to occur every 20 to 30 years (the most recent event occurred in 1998). These events occur when the surface waters of the central and northern Pacific Ocean shift several degrees from the mean water temperature. The waters off the California coast have warmed significantly over the last forty years, possibly a result of global warming or interdecadal climate shift (NOAA 2003).

Water Quality

The water quality study area extends beyond the sanctuaries' proposed boundaries due to potential impacts from outside the proposed boundaries. For example, pollutants may be carried by ocean currents and there are freshwater inputs from rivers and tributaries. These discharges into the marine environment adjacent to the sanctuary expansion area could impact water quality. Therefore, the study area for freshwater input comprises more than 40 coastal streams and three large rivers that contribute to the nearshore chemical characteristics of the proposed expansion area. The three major freshwater sources are the Russian, Gualala and Garcia rivers. These rivers are affected by multiple activities in the watersheds including but not limited to agriculture, rock and gravel mining, grazing, logging, land development (SWRCB 2010), and septic system leakage. The freshwater inputs from the many coastal creeks are minor sources of chemical constituents and nutrients to the sanctuaries. In total, the study area includes oceanic waters within the expansion area, the marine areas adjacent to the expansion area, and the watersheds contributing to the marine water quality in the proposed expansion area.

In general, the marine water in the proposed expansion area is considered to be of relatively good quality due to the rural nature of most of the northern coast of California. Along the coast adjacent to the proposed expansion area, there is less than 4 sq miles of agricultural land and the sparsely developed areas along the coast have on the order of 93 people per square mile north of the town of Gualala and 7 to 36 people per square mile south of Gualala along the coast (ESRI 2010). Most of the coastal watersheds are comprised of forest and grass lands (USGS 2009). However, there are numerous persistent threats to water quality in the study area due to runoff from the Garcia, Gualala, and Russian Rivers and San Francisco Bay (Largier 2013b). In some cases, these contaminants can result in a variety of biological impacts, including bioaccumulation, reduced recruitment of anadromous species (e.g., salmon, that migrate from salt water to spawn in fresh water), mortality due to toxicity, pathogen contamination, and interference with recreational uses of coastal areas. These adverse water quality impacts can impair designated benefi-

cial uses (CDFG 2007). Additionally, there are sources of marine water pollution, which include vessel sewage and graywater discharges, engine emissions, spill incidents, and illegal dumping.

Some locations within the study area are designated to protect water quality. The State Water Resources Control Board (SWRCB) establishes "areas of special biological significance" (ASBS) through the California Ocean Plan. ASBS are a subset of State water quality protection areas (SWQPAs) that are "designated to protect marine species or biological communities from an undesirable alteration in natural water quality…" (Public Resources Code Section 36700[f]).These areas were designated based on the presence of certain species or biological communities that, because of their value or fragility, deserve special protection by preserving and maintaining natural water quality conditions to the extent practicable. One example of special protection is a prohibition on the discharge of both point and nonpoint source waste, unless the State Water Resources Control Board grants an exception after determining that the exception will not compromise protection of ocean waters for beneficial uses, and, the public interest will be served. There are four ASBS within the expansion area: Saunders Reef, Del Mar Landing, Gerstle Cove, and Bodega ASBS (SWRCB 2012). Although the total area combined in these ASBS are approximately 1.1 sq nm, which is less than 0.05% of the proposed expansion area, each of these areas benefit from protection beyond that offered by standard waste discharge restrictions and other measures.

Through the National Pollutant Discharge Elimination System (NPDES), there is one permitted source of discharge into the study area from land at the University of California Davis Bodega Marine Laboratory. There is a waste water treatment facility at Point Arena on the coast, however the discharge is to four percolation ponds and not directly to the ocean. There is also a waste water treatment plant with an NPDES permit operated by the Russian River County Sanitation District and Sonoma County Water Agency which discharges tertiary treated effluent to the Russian River just downstream of the town of Guerneville from October 1 to May 14. The plant treats 0.71 million gallons per day (mgd) (average dry weather treatment capacity) and 3.5 mgd (peak wet weather treatment capacity). Vessel discharges in the study area are also regulated under the NPDES, through the Vessel General Permit (VGP).

All three of the main rivers (Garcia, Gualala and Russian) in the study area do not meet established water quality standards under the Clean Water Act (CWA). When this occurs, a water body is placed on an impaired waters list mandated by §303(d) of the federal Clean Water Act. States are required to update this list every two years and work to resolve the problems associated with the listed water bodies. Typically, a total maximum daily load (TMDL) is developed for such impaired waters. A TMDL determines the total amount of the pollutant/stressor (e.g. pathogens, sediment, nutrients) that the water body can receive and still meet water quality standards, and an allocation of that amount to the pollutant's sources (SWRCB 2010). The TMDL then allocates the allowable loading to all point and non-point sources to the water body and establishes an implementation plan to ensure that the allocations and water quality standards are achieved. Based on information in the 2010 California SWRCB Integrated report on Water Quality, the Garcia, Gualala, and Russian Rivers are designated as impaired primarily due to sedimentation/ siltation and water temperature. The Lower Russian River and Clam beach (just north of Fort Ross State Historic Park) are listed for pathogens. Most expected TMDL completion dates are 2019 (SWRCB 2010).

Key sources of pollution, especially as related to the proposed action, are described in greater detail below.

Land-based Pollution (Point Source and Nonpoint Source)

There is very little activity in the watersheds flowing to the ocean that is detrimental to ocean water quality in this region. Land-based pollution comes from either point source or non-point sources. Point source pollution originates from known sources such as industrial facilities or wastewater treatment plants. Non-point source pollution is more diffuse and comes from many different sources that cannot be identified. It includes pollutants such as oil, grease, fertilizers, metals, and sediments that are collected by rain or irrigation water that then carries the runoff from streets and parking lots to surface and ground water (USEPA 2013a). The large river systems have the most potential to impact the nearshore environment and typical sources of pollutants include livestock grazing, agriculture, and land development. The threat is relatively minor for most of the coastal marine area of the study area due to minimal pollution sources and the strong circulation patterns of the Pacific.

Other land-based pollution of nearshore waters includes runoff from San Francisco Bay, aging sewer infrastructure systems or septic system malfunctions, and other unknown or unidentified sources. Most of the coastal communities use septic systems, which can be a source of potential nutrient loading from leaking septic systems.

The State Mussel Watch monitoring results discussed in the ASBS Environmental Impact Report found high levels of pesticide compounds in at least one sample between 2001 and 2004 at Bodega Head and the highest concentration of all ASBS in the state for Chromium from 2007 to 2009 at the same location (SWRCB 2012).

Beach closures result from known discharges of sewage that enter the marine environment. Beach advisories occur when laboratory results indicate that fecal indicator bacteria in a water sample exceed water quality standards. Within the study area, the Sonoma County Division of Environmental Health collects water samples for beaches monitored pursuant to California Health and Safety Code § 115880. There are five beaches that are monitored on a weekly or monthly basis in Sonoma County. For the period from 2000 to 2009, all five beaches were closed twice, and one as many as seven times. An advisory means the objective set by the USEPA for fecal indicator bacteria was exceeded. Salmon Creek State beach was closed five times (SWRCB 2013). None of the beaches within the southern Mendocino County portion of the study area are monitored by the California Department of Health because there are no beaches there that meet the criteria for beach monitoring (mainly beach visitation of more than 50,000 per year). In general, it appears that the water quality at most beaches within the study area is very good. For all of the postings, the sources were either unknown or wildlife.

There are many non-traditional municipal separate storm sewer systems (MS4s) adjacent to the study area. A MS4 is a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains). Small MS4s include systems similar to separate storm sewer systems in municipalities, such as systems at military bases, large hospital or prison complexes, and highways and other thoroughfares, but do not include separate storm sewers in very discrete areas, such as individual buildings [40 C.F.R. §122.26(b)(16(iii)]. Within the study area, most MS4s are designated because they are located adjacent to beaches that are monitored as a result of AB 411 (see discussion in Regulatory Overview), are an ASBS, or are a flood control district.

Requirements for new non-traditional MS4s include: eliminating dry weather flows, prohibiting illicit discharges and illegal connections, responding to spills, etc. USEPA's Stormwater Phase II Rule establishes an MS4 stormwater management program that is intended to improve the Nation's waterways by reducing the quantity of pollutants that stormwater picks up and carries into storm sewer systems during storm events (USEPA 2000). MS4s must establish an education/outreach program, illicit discharge detection and elimination training, and public participation program (MS4 2013).

Vessel Discharges

There are two primary issues of concern associated with discharges: cruise ship discharge and other vessel (shipping, fishing, etc.) discharge. Cruise ship discharges are addressed separately below. This section addresses the types of discharge from commercial, recreational and government vessels that transit through and operate in the study area. During normal operations, vessels produce a multitude of wastes, which when discharged into the marine environment, can impact the water quality. Information about vessel operations in the study area is in Section 4.4 (Commercial Fishing and Aquaculture) Section 4.6 (Socio-economic Resources, Human Uses, and Environmental Justice, under Recreational Boating), Section 4.8 (Marine Transportation) and Section 4.9 (Homeland Security and Military Uses). Potential discharges from these types of vessels include sewage, graywater, bilge water, ballast water, hazardous wastes, and solid wastes. These discharges are discussed below.

Sewage

Sewage (also referred to as black water) includes vessel sewage and other wastewater. Sewage from ships is generally more concentrated than sewage from land-based sources, as it is diluted with less water when flushed. Sewage discharge may contain bacteria or viruses that cause disease in humans and other wildlife. High concentrations of nutrients in sewage, namely nitrogen and phosphorous, can lead to eutrophication, the process where 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.

A Marine Sanitation Device (MSD) is equipment on board a vessel designed to receive, retain, treat, control, or discharge sewage. Chemicals and deodorants often used in MSDs, including chlorine, ammonia, or formaldehyde, can also impact water quality. Section 312 of the CWA (33 U.S.C. § 1322) requires the use of MSDs for all vessels within 3 miles (2.6 nm) of the coastline if vessels have an installed toilet. The USEPA and U.S. Coast Guard (USCG) jointly regulate MSDs under CWA section 312.

Vessels 20 meters (65 feet) and under may use a Type I, II, or III MSD. Vessels over 65 feet in length must have a Type II or Type III MSD (33 CFR 159.7). Smaller vessels may have MSDs (but are not required to), or may have portable toilets, portable sewage receptacles, or no toilet facilities. Type I MSDs rely on maceration and disinfection for treatment of the waste prior to its discharge into the water. 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. A Type II MSD must meet a water quality standard of 200 fecal coliform per 100 ml of water, for sewage treatment. Type III MSDs, commonly called holding tanks, flush sewage from the marine head into a tank containing deodorizers and other chemicals (USEPA 2013b). The contents of the holding tank are stored until the contents can be properly disposed of, at a shore-side pump-out facility or dump station, into a mobile pumpout unit, or into ocean

waters where sewage discharge is permitted. Type III MSDs can be equipped with a discharge option, usually called a Y-valve, which allows the boater to direct the sewage from the head either into the holding tank or directly overboard. There are no known public pump-out facilities within the proposed expansion area, but there is a pump-out facility in Bodega Harbor, adjacent to the expansion area. At least two mobile pumpout companies indicate they service areas of Sonoma County; schedule and cost may depend upon such factors as the location of the vessel to be pumped out and if other nearby customers order the pumpout service. There are dump stations adjacent to the expansion area at Manchester State Park, Anchor Bay Campground (private), Gualala Point Regional Park, and Stillwater Cove Regional Park. There are also dump stations near the expansion area at Doran Regional Park and Westside Regional Park.

Pursuant to Section 312(f)(4)(A) of the CWA (33 U.S.C. § 1322), USEPA established a No Discharge Zone (NDZ) for marine waters within 3 miles of the coastline in the State of California for sewage discharges from: all large passenger vessels of 300 gross tons or greater; and from large oceangoing vessels of 300 gross tons or greater with available holding tank capacity or containing sewage generated while the vessel was outside of the marine waters of the State of California (USEPA 2012). NDZs are designated bodies of water where the discharge of treated and untreated sewage from vessels is prohibited. This action was taken in response to an application from the California State Water Resources Control Board requesting establishment of this NDZ. Based on the State's application, USEPA determined that the protection and enhancement of the quality of California's marine waters requires the prohibition of sewage discharges from these two classes of large vessels in the State waters of California from the Oregon border to the Mexican border, including the waters extending 3 miles from the Farallon Islands (USEPA 2012). The final rule went into effect March 28, 2012 (40 CFR Part 140). This means that in the study area there is enhanced water quality protection from vessel discharges within California State waters, but vessels can discharge sewage, treated or untreated, outside of 3 miles.

Graywater

Graywater from vessels includes wastewater from showers and galleys. Pollutants in graywater include suspended solids, oil, grease, ammonia, nitrogen, phosphates, copper, lead, mercury, nickel, silver and zinc, detergents, cleaners, oil and grease, metals, pesticides, and medical and dental wastes. USEPA regulates incidental discharges from the normal operation of vessels, excluding discharges from military vessels or recreational vessels, through the NPDES vessels program. Incidental discharges from the normal operation of vessels include ballast water, bilge water, graywater and anti-foulant paints (and their leachate). These discharges may result in negative environmental impacts via the addition of traditional pollutants or, in some cases, by contributing to the spread of aquatic invasive species (USEPA 2013c). The NPDES vessels program is administered through the VGP. Waters of the study area in the territorial sea (within 3 miles of the coastline), but not waters seaward of the territorial sea are subject to the VGP (USEPA 2013d). On March 28, 2013, USEPA issued the 2013 VGP, effective beginning December 19, 2013, to authorize discharges incidental to the normal discharge of operations of commercial vessels. Discharge of graywater in the study area is addressed in the following way under the VGP:

- For vessels greater than 400 gross tons that regularly travel more than one nm from shore that have the capacity to store graywater for a sufficient period, graywater must be discharged greater than one nm (1.15 statute miles) from shore while the vessel is underway.

- The California provisions for the VGP prohibits graywater discharges from oceangoing vessels of 300 gross tons or more if they have sufficient holding capacity; any co-mingling of sewage and graywater are considered graywater for purposes of these conditions as stated in section 2.2.25 of the VGP.
- Vessels that do not regularly travel more than one nm from shore and without storage capacity shall minimize the discharge of graywater and, provided the vessel has available graywater storage capacity, must dispose of graywater onshore if appropriate facilities are available and such disposal is economically practicable and achievable.
- The introduction of kitchen oils to the graywater system in non-harmful quantities must be minimized. Kitchen oil in harmful quantities is prohibited. Vessel owners/operators must use phosphate-free and minimally toxic soaps and detergents. Soaps and detergents must be free from toxic or bioaccumulative compounds and not lead to extreme shifts in receiving water pH.

Bilge Water

Bilge water includes fuel, oil, wastewater, other chemicals, and materials that collect at the bottom of the ship's hull with fresh and seawater. Under the Oil Pollution Act and the CWA, vessels are prohibited from releasing any discharge with an oil content of greater than fifteen parts of oil per one million parts water (ppm) within 14 miles (12 nm) of land. Beyond 14 miles, discharges with oil content greater than 100 ppm are prohibited. Under the California Clean Coast Act, cruise ships and other ships of 300 gross tons or more may not release oily bilge water in the marine waters of the State (3 nm from shore). Vessels are prohibited from discharging bilge water with an oil content greater than 15 ppm within 12 nm of land and, beyond 12 nm of land, greater than 100 ppm.

Ballast Water

Large vessels can take on millions of gallons of ballast water, often from coastal waters in one location, and discharge it, often at another location, for the purpose of stability. Ballast operations have led to the introduction of invasive species, which are considered a threat to water quality and can disrupt marine ecosystems. Ballast water appropriation and discharge within State waters is regulated by the California Marine Invasive Species Act, authorized through AB 433, signed by the Governor in 2003; the California Coastal Ecosystems Protection Act authorized by SB 497 signed by the Governor in 2005; California Code of Regulations, Title 2, Division 3, Chapter 1, Article 4.6, "Ballast Water Regulations for Vessels Arriving at California Ports or Places after Departing from Ports or Places Within the Pacific Coast Region" (2013) and the VGP. The Marine Invasive Species Act and the California Code of Regulations Title 2, Division 3, Chapter 1, Article 4.6, contain specific ballast water discharge requirements applicable to vessels. The Coastal Ecosystem Protection Act requires the State to adopt ballast water performance standards, sets specific deadlines for the removal of different types of species from ballast water. The California Marine Invasive Species Program, administered by the CSLC, is charged with preventing or minimizing the introduction of nonindigenous species to California Waters from vessels over 300 gross registered tons, capable of carrying ballast water. Throughout the study area, discharges of ballast water must also comply with applicable USCG regulations (33 CFR Part 151). All discharges of ballast water may not contain oil, noxious liquid substances, or hazardous substances in a manner prohibited by U.S. laws, including section 311 of the CWA.

Hazardous Materials

Various hazardous materials are used and hazardous wastes are generated during the course of vessel operations. For example, hazardous wastes generated on cruise ships include dry cleaning and photo processing chemicals, paints and solvents, batteries, and fluorescent light bulbs containing mercury. These substances can be toxic or carcinogenic to marine life. The Resource Conservation and Recovery Act (RCRA) requires that vessels that generate or transport hazardous waste offload these wastes at treatment or disposal facilities or outside of the territorial waters of the U.S.

Solid Wastes

Solid wastes generated by vessels include food waste, cans, glass, wood, cardboard, paper, and plastic. The discharge of solid wastes is regulated under Act to Prevent Pollution from Ships (APPS) and CWA. The Marine Plastic Pollution Research and Control Act (implementing the International Convention for the Prevention of Pollution from Ships [MARPOL]) is an international agreement regulating the disposal of plastics and garbage pursuant to Annex V.[13] Under these regulations, the disposal of plastics is prohibited in any waters, and floating dunnage[14] and other materials are prohibited in navigable water within 12 nm from land. Other garbage, such as food waste, paper and metal, can be disposed of beyond 12 nm from shore. Garbage ground to pieces under an inch can be discharged beyond 3 nm from shore.

Cruise Ship Discharges

Cruise ships generate domestic wastewater and other by-products during the course of their daily operations. The main pollutants generated by a cruise ship include sewage, graywater, bilge water, ballast water, hazardous waste, and solid waste. Each of these pollutants is defined above in the vessel discharges discussion. The most common domestic wastes are sewage, or “black water,” which is human waste from toilets and urinals, plus medical facility sink drainage, and “graywater,” which is typically galley, laundry, bath/shower, and sink drainage. Discharges from sewage and graywater are discussed below.

The volume of discharges from large cruise ships is of particular concern. Cruise ships regularly transit the study area and embark passengers at ports within the San Francisco and Monterey bays. Between 2008 and 2010, a yearly average of over 100 cruise ships transited in and out of San Francisco Bay, many headed north to destinations in the Pacific Northwest, Canada and Alaska. Cruise ships may also head to Hawaii and to ports south in California, Mexico (Port of San Francisco 2013), and beyond, embarking and disembarking passengers at each port. Although partly constrained by the lack of local docking facilities, cruise ship visits to the area are likely to continue to grow as the fleet shifts from international to more domestic cruises, and due to a new cruise ship docking facility in San Francisco Bay. The terminal is expected to receive its first cruise ship in 2014.

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[13] The MARPOL Convention sought to eliminate and reduce the amount of garbage being dumped into the sea from ships. Under Annex V of the Convention, garbage includes all kinds of food, domestic and operational waste, excluding fresh fish, generated during the normal operation of the vessel and liable to be disposed of continuously or periodically. Annex V specifies distances from shore and the manner in which they may be disposed. Extensive amendments to Annex V entered into force on 1 January 2013. The revised Annex V prohibits the discharge of all garbage into the sea, except as provided otherwise, under specific circumstances. The Annex also obliges Governments to ensure the provision of facilities at ports and terminals for the reception of garbage (IMO 2013).

[14] Loose packing material used to protect a ship's cargo from damage during transport.

Large cruise ships can carry thousands of passengers and can generate several million gallons of waste per day. The typical storage capacities for cruise ships are as follows: graywater – 500-2100 tons, black water – 400-1,000 tons, and bilge water – 60-300 tons. Only recently cruise ship discharges have been prohibited within 3 miles of California's coast. This does not extend protection to federal waters outside of California State water boundaries.

Graywater discharges from cruise ships in the study area historically have been excluded from CWA permitting requirements through regulations at 40 CFR 122.3(a). However, a court order vacated that exclusion as of December 19, 2008, and as a result, except for the Great Lakes, graywater discharges into waters of the U.S. from cruise ships 79 feet or longer in length are subject to NPDES permitting (USEPA 2008) through the VGP. Under the 2013 VGP, graywater discharge from cruise ships is prohibited in State waters if they have sufficient holding capacity. Any co-mingling of sewage and graywater will be considered graywater for purposes of these conditions as stated in section 2.2.25 of the VGP. Graywater discharges from large cruise ships (500 or more passengers) and medium cruise ships (100-499 people) must be held until outside 3 miles from shore unless they meet specified effluent limits; discharge of untreated graywater within 3 miles from shore from medium cruise ships is not authorized, unless they are unable to voyage more than one nm from shore and do not have the capacity to meet specified standards — then they must hold the graywater unless the vessel is underway and sailing at six knots or more outside marine sanctuary waters subject to the VGP.

Spill Incidents

There is a persistent threat to water quality from an accidental spill from a vessel within or outside the study area. Offshore spills, particularly near high-use shipping lanes, have the potential to severely impair water quality. In the event of an oil or toxic chemical spill, the impact on the sanctuaries would depend on the spill location, the type of material spilled, and the wind and sea conditions. Oil and other chemical spills and vessel groundings can pose a serious threat to nearshore and estuarine communities as well as archaeological resources. Spilled oil can smother benthic biota and foul or poison organisms and fish breeding habitat. Oil buried by sand or gravel can have long-term chronic effects by slowly and continuously releasing toxic compounds when exposed to wave action.

Spill incidents could also impact pelagic biota such as krill and forage fish as well as larval fish and crustaceans, especially if response operations involve the use of chemical dispersants. The impact of surface and subsurface oil on water quality and significance of the resulting cascading ecosystem effects is particularly of concern in the upwelling-dominated study area.

Dredge Disposal

Disposing of dredged material in the ocean adversely impacts the marine environment by increasing water column turbidity; however, there are currently no dredge disposal sites or areas being dredged within the proposed expansion area. The closest disposal site is the San Francisco Deep Ocean Disposal Site (SF-DODS), which is located approximately 25 nm west of the Farallon Islands, and approximately 10 nm west of the western boundary of GFNMS. This site is used for the disposal of uncontaminated material generated during dredging activities in the San Francisco Bay and Bodega Bay. Through the 2007 disposal year, almost 16 million cubic yards of dredged material have been diverted to the SF-DODS from traditional in-Bay sites, reducing risks of disposal-related impacts within those sensitive waters, and that

reduction of risk has been accomplished without causing any known significant impacts on the ocean (Germano & Associates, Inc. 2010). Dredging occurs in the vicinity of Spud Point Marina breakwater in the northwestern part of Bodega Harbor, adjacent to the study area. The work consists of maintenance dredging, when needed, of approximately 143,000 cubic yards of materials for the Bodega harbor, channel, and USCG Station. The dredged materials are disposed at SF-DODS and/or SF-8, both of which are outside of the study area.

4.2.2 Regulatory Overview

The existing regulatory environment applicable to the proposed expansion area is summarized in the following paragraphs, by physical resource area (i.e., air quality and climate, geology and oceanography and water quality).

Air Quality and Climate

Federal and State air quality standards are referenced in Section 4.2.1 (Regional Overview of Affected Environment), in the discussion of air basins.

Federal Clean Air Act

Section 176(c) of the Federal Clean Air Act (FCAA) contains provisions that apply specifically to federal agency actions, including actions that receive federal funding. This section of the FCAA requires federal agencies to ensure that their actions are consistent with the FCAA and with applicable State air quality management plans.

The USEPA's general conformity rule applies to federal actions occurring in nonattainment or in certain designated maintenance areas when the total direct and indirect emissions of nonattainment pollutants (or their precursors) exceed specified thresholds. The emission thresholds that trigger requirements of the conformity rule are called de minimis levels. Emissions associated with stationary sources that are subject to permit programs are incorporated into the State implementation plan and are not counted against the de minimis threshold. The federal agency providing the funding for the proposed action is responsible for submitting conformity determination documentation to the USEPA. The proposed action does not include stationary or mobile sources of emissions and would not result in emissions that exceed the thresholds; therefore, the proposed action is not subject to a formal conformity determination.

Annex VI Prevention of Air Pollution from Ships

Annex VI of MARPOL entered into force on May 19, 2005. It sets limits on sulphur oxide and nitrogen oxide emissions from ship exhausts and prohibits deliberate emissions of ozone depleting substances; designated emission control areas set more stringent standards for SOx, NOx and particulate matter. In 2011, the International Maritime Organization (IMO) adopted more stringent measures to significantly reduce the amount of greenhouse gas emissions from ships; these measures went into effect on January 1, 2013 (IMO 2013).

Geology and Oceanography

See Section 4.7 (Offshore Energy) for specific regulations regarding oil, gas and alternative energy development.

Submerged Lands Act, 43 U.S.C. § 1301 et seq.

Under the Submerged Lands Act (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 3 miles of their coastline. For purposes of the Submerged Lands Act, the term "natural resources" includes oil, gas and all other minerals.

Outer Continental Shelf Lands Act, 43 U.S.C. § 1331 et seq.

The Outer Continental Shelf Lands Act (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 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.

Deep Seabed Hard Mineral Resources Act, 30 U.S.C. § 1401 et seq.

The Deep Seabed Hard Mineral Resource Act provides 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.

Water Quality

Marine water quality is regulated by numerous statutes and government agencies. These serve to protect the marine environment from the various point and nonpoint sources of marine pollution. Regulations applicable to the various types of cruise ship discharges are described above in the affected environment.

Rivers and Harbors Appropriations Act of 1899, 33 U.S.C. §§ 401, 403

Section 9 of the Federal Rivers and Harbors Appropriations Act of 1899 (RHA) prohibits the construction of any dam or dike across any navigable water of the United States in the absence of Congressional consent and approval of the plans by the Chief of Engineers and the Secretary of the Army.

Section 10 prohibits the unauthorized obstruction or alteration of any navigable water. Navigable waters under the RHA are those "subject to the ebb and flow of the tide and/or are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce" (33 CFR 3294). Typical activities requiring Section 10 permits are construction of piers, wharves, bulkheads, marinas, ramps, floats, intake structures, cable or pipeline crossings, and dredging and excavation.

The U.S. Army Corps of Engineers (USACE) acts in accordance with the provisions of the Rivers and Harbors Act, which regulates placement of structures or other work in addition to fill in "navigable waters," and the CWA (Section 404), which governs fill in "waters of the United States," including wetlands. A USACE permit is required if a project would place structures within navigable waters or if it would result in altering waters of the U.S. below the ordinary high water mark in nontidal waters. The USACE does not issue these types of permits in cases where the USACE itself is the lead agency; instead it evaluates the project to determine compliance and acceptability.

Federal Water Pollution Control Act, commonly known as the Clean Water Act, 33 U.S.C. § 1251 et seq.

The CWA was passed in 1972 by Congress, and amended in 1987. Point source discharges are illegal under the Clean Water Act unless authorized by an NPDES permit. Under CWA Section 402 (33 U.S.C. § 1342), any discharge of a pollutant from a point source (e.g., a municipal or industrial facility) to the navigable waters of the United States or beyond must obtain an NPDES permit, which requires compliance with technology- and water quality–based treatment standards. Two sections of the CWA deal specifically with discharges to marine and ocean waters.

Under CWA Section 403 (33 U.S.C. § 1343), any discharge to the territorial seas (3 miles) or beyond also must comply with the Ocean Discharge Criteria established under CWA Section 403.

CWA Section 312 (33 U.S.C. § 1322) contains regulations protecting human health and the aquatic environment from disease-causing microorganisms that may be present in sewage from boats. Pursuant to Section 312 of the CWA, all recreational boats with installed toilet facilities must have an operable MSD on board. All installed MSDs must be USCG-certified. USCG-certified devices are so labeled except for some holding tanks, which are certified by definition under Section 312 of the CWA (33 U.S.C. § 1322).

Title I of the Marine Protection, Research, and Sanctuaries Act, also known as the Ocean Dumping Act, 33 U.S.C. §§ 1401-1445

The Marine Protection, Research, and Sanctuaries Act (MPRSA) regulates the dumping of wastes into marine waters. It is the primary federal environmental statute governing transportation of dredged material for the purpose of disposal into ocean waters, while CWA Section 404 governs the discharge of dredged or fill material into waters of the U.S. In 1983, a global ban on the dumping of radioactive wastes was implemented. The MPRSA and the CWA regulate materials that are disposed of into the marine environment, and only sediments determined to be nontoxic by USEPA standards may be disposed of into the marine environment. The USEPA and the USACE share responsibility for managing the disposal of dredged materials (Chin and Ota 2001).

Oil Pollution Control Act, 33 U.S.C. § 2701 et seq.

The Oil Pollution Control Act of 1990 requires extensive planning for oil spills from tank vessels and onshore and offshore facilities and places strict liability on parties responsible for oil spills. See Section 4.8 (Marine Transportation) for more information.

Act to Prevent Pollution from Ships, 33 U.S.C. § 1901 et seq.

The discharge of solid wastes is regulated under the APPS, as amended by the Marine Plastic Pollution Research and Control Act of 1987, and the CWA. The APPS regulates the disposal of plastics and garbage for the United States Annex V of the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 (MARPOL 73/78). Under these regulations the disposal of plastics is prohibited in all waters, and other garbage, including paper, glass, rags, metal, and similar materials, is prohibited within 14 miles (12 nm) from shore (unless macerated).

Coastal Zone Management Act, 16 U.S.C. §§ 1451-1466

The Coastal Zone Management Act (CZMA) provides incentives for coastal states to develop and implement coastal area management programs. It is significant with regards to water pollution abatement, particularly concerning nonpoint source pollution.

Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. §§ 9601-9675

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) addresses cleanup of hazardous substances and mandates liability for environmental cleanup on those whose actions cause release into the environment. In conjunction with the CWA, it requires preparation of a National Contingency Plan for responding to oil or hazardous substances release. The Comprehensive Environmental Response, Compensation, and Liability System (CERCLIS) database contains information on hazardous waste sites, potential hazardous waste sites, and remedial activities across the nation, including sites that are on the National Priorities List (NPL) or being considered for the NPL. CERCLIS contains information on sites located within the shoreline counties of the study area. While there are no sites on the coast in Sonoma and Mendocino Counties, there are 26 sites in Sonoma County and 6 in Mendocino County.

Resource Conservation and Recovery Act, 42 U.S.C. §§ 6901-6992k

The RCRA addresses hazardous waste management, establishing duties and responsibilities for hazardous waste generators, transporters, handlers, and disposers.

Porter-Cologne Water Quality Control Act, California Water Code §§ 13000-14958

The Porter-Cologne Water Quality Control Act contains provisions for enforcing water quality standards through issuance of Waste Discharge Requirements. Pursuant to the act, the SWRCB has the primary responsibility to protect California's coastal and ocean water quality. SWRCB has been given the authority by the USEPA to administer the NPDES program for California. The Regional Water Quality Control Boards, in coordination with the SWRCB, issue both State waste discharge requirements and NPDES permits to individual dischargers. Dischargers are required to establish self-monitoring programs for their discharges and to submit compliance reports to Regional Water Quality Control Boards. The SWRCB has established regulations to implement these measures through water quality control plans, including the California Ocean Plan (Ocean Plan), the Regional Water Quality Control Plans (Basin Plans), and the Thermal Water Quality Control Plan (California Ocean Resources Management Program 1995).

California Health and Safety Code § 115880 et seq.

Originally authorized under AB 411 (Wayne 1997), California has established minimum standards for the sanitation of public beaches, including: 1) requiring the testing of the waters adjacent to all public beaches for microbiological contaminants; 2) establishing protective minimum standards for total coliform, fecal coliform, and enterococci bacteria, or for other microbiological indicators and (3) requiring that the waters adjacent to public beaches are tested for total coliform, fecal coliform, and enterococci bacteria, or for other microbiological indicators if appropriate. Since 2012, testing on beaches that are visited by more than 50,000 people annually and are located on an area adjacent to a storm drain that flows in the summer is required on a weekly basis from April 1 to October 31, inclusive, of each year.

California Coastal Act, Cal. Pub. Res. Code § 30000 et seq.

The California Coastal Act of 1976 mandates protections for terrestrial and marine habitat through its policies on visual resources, land development, agriculture, commercial fisheries, industrial uses, water quality, offshore oil and gas development, transportation, power plants, ports, and public works. The California Coastal Commission administers various programs, including Local Coastal Programs and the Water Quality Program, which facilitates the interagency Nonpoint Source Pollution Control Program.

California Marine Invasive Species Act, Cal. Pub. Res. Code § 71200 et seq.

The California Marine Invasive Species Act of 2003 applies to all vessels, United States and foreign, carrying, or capable of carrying, ballast water into the coastal waters of the State after operating outside of the coastal waters of the State, except vessel of the armed forces or a foreign vessel merely traversing the territorial sea of the United States and not entering or departing a United States port, or not navigating the internal waters of the United States, and that does not discharge ballast water into the waters of the State, or into waters that may impact waters of the State. It requires mid-ocean exchange or retention of ballast water for vessels coming from outside the EEZ and requires vessels coming from other west coast ports to minimize ballast water discharge. Record-keeping and other compliance measures apply to all vessels entering California waters.

California Ballast Water Regulations, CCR, Title 2, Division 3, Chapter 1, Article 4.6 et seq.

The master, operator, or person in charge of vessels over 300 gross registered tons capable of carrying ballast water arriving at a California port or place carrying ballast water from another port or place within the Pacific Coast must employ at least one of the following ballast water management practices: (1) exchange the vessel's ballast water in near-coastal waters (more than 50 nm from land and at least 657 feet deep), before entering the waters of the State, if that ballast water has been taken on in a port or place within the Pacific Coast region; (2) retain all ballast water on board the vessel; (3) use an alternative, environmentally sound method of ballast water management that, before the vessel begins the voyage, has been approved by the CSLC or the USCG as being at least as effective as exchange, using mid-ocean waters, in removing or killing nonindigenous species; (4) discharge the ballast water to a reception facility approved by the commission; or (5) under extraordinary circumstances where compliance with the four options above is not practicable, perform a ballast water exchange within an area agreed to by the CSLC in consultation with the USCG. “Pacific Coast Region” is defined in Article 4.6 as all estuarine and ocean waters within 200 nm of land or less than 2,000 meters (6,560 feet, 1,093 fathoms) deep, and rivers, lakes or other water bodies navigably connected to the ocean on the Pacific Coast of North America east of 154 degrees west longitude and north of 25 degrees north latitude, exclusive of the Gulf of California. Additional information on ballast water management is provided in Section 4.8 (Marine Transportation).

California Clean Coast Act, Cal. Pub. Res. Code § 72400 et seq.

The California Clean Coast Act, which became effective on January 1, 2006, prohibits the release from large passenger vessels (cruise ships) and other oceangoing ships (300 gross tons or more) of hazardous waste, oily bilge water, other waste, and sewage sludge into the marine waters of the State and marine sanctuaries and sets up notification protocols for release of these substances into State waters or waters of a national marine sanctuary. The Clean Coast Act also prohibits the release of graywater from cruise ships and oceangoing ships with sufficient holding capacity into the marine waters of the State. Furthermore,

the Clean Coast Act requires the State Water Resources Control Board to request the appropriate federal agencies to prohibit the release of wastes from cruise ships and oceangoing ships into State marine waters and the four national marine sanctuaries in California. The Act is more stringent than federal regulation of cruise ships and also provides the strongest State protections from cruise ship pollution in the United States.

4.2.3 Impact Assessment Methodology

The overall methodology, including data sources and assumptions, used to conduct the physical resources impact evaluation is consistent with the NOAA NEPA guidelines (NAO 216-6).

Air Quality

Criteria to determine the significance of air quality impacts are based on federal, State, and local air pollution standards and regulations. Impacts are considered to be significant if project emissions would result in the following:

- Increase ambient pollutant levels from an attainment or nonattainment-transition status to nonattainment under the NAAQS or California Ambient Air Quality Standards;
- Exceed the thresholds the regional air agencies use for determination of significance for California Environmental Quality Act (CEQA) purposes (thresholds are based on the amount of emissions projected to be generated by a project and are expressed in terms of either pounds per day or tons per quarter); or

For the purposes of this analysis, major factors considered in determining whether an alternative would have a significant impact on air quality include the following:

- The amount of net increase in emissions per year of criteria pollutants within a given air basin or offshore sanctuary (the Clean Air Act sets a threshold of 91 metric tons [100 tons] per year for nonattainment areas);
- Whether relatively high emissions would occur on a continuing basis for periods longer than the timeframe of relevant ambient air quality standards (e.g., 8-hour periods for ozone precursors; 3-hour and 24-hour periods for sulfur oxides; 24-hour periods for PM_{10});
- Whether emissions of precursors to ozone or other secondary pollutants would occur in such quantities and at such locations as to have a reasonable potential to cause or contribute to a violation of federal or State ambient air quality standards; or
- Whether emissions of hazardous air pollutants could exceed State standards or other hazardous air pollutant exposure guidelines at locations accessible to the general public.

Pursuant to the above criteria, substantive adverse air quality impacts were not identified for the proposed action. Therefore, regional and State thresholds regarding air emission quantities are not discussed in the impacts section since the proposed and alternative actions will not result in substantive increases in daily, monthly, or annual emission volumes.

Geology and Oceanography

Impacts on the geological and oceanographic resources are considered to be significant if the proposed action results in any of the following:

- Allows for exploitation of geologic resources inconsistent with the purposes and policies of the NMSA and its implementing regulations;
- Degrades the physical structure of any geologic resource that is measurably different from pre-existing conditions; or
- Alters any oceanographic process, such as sediment transport, that is measurably different from pre-existing conditions.

The methodology used to conduct the geological and oceanographic impact evaluation was to consider each of the proposed actions individually and to assess any potential impacts on these resources.

Water Quality

Criteria to determine the significance of water quality impacts are based on federal, State, and local water quality standards and regulations. Impacts are considered to be significant if a proposed action would:

- Alter the bacterial, physical, or chemical characteristics of near-shore ocean waters (not including enclosed bays or estuaries) so that they exceed effluent limitations established under the California Ocean Plan;
- Alter the bacterial, physical, or chemical characteristics of bay or estuary waters so that they violate requirements or exceed effluent limitations established by the Basin Plans for the North Coast and the San Francisco Bay Regional Water Quality Control Board;
- Result in ocean discharges not allowed for by a NPDES permit, or which do not meet discharge criteria established under the CWA;
- Increase the discharge or deposition of unauthorized waste into the sanctuary or in an area outside the sanctuary that could migrate into the sanctuary and affect its resources (including onshore urban or agricultural runoff);
- Increase the likelihood of exposing the environment to any hazardous conditions through release or disposal of oil, fuel, or hazardous substances; or
- Conflict with guidelines provided for by the Nonpoint Source Pollution Control Program's Management Measures.

The methodology used to determine whether a proposed or alternative action would have a significant impact on water quality is as follows:

- Review and evaluate existing and past baseline activities to identify the action's potential to impact water quality;

- Review and evaluate each proposed action and alternative to identify the action's potential to increase marine pollution or otherwise impact water quality within the sanctuaries; and
- Assess the compliance of each proposed action with applicable federal, State, or local water quality regulations, guidelines, and pollution prevention measures.

4.2.4 Environmental Consequences

Overall, the proposed expansion of the national marine sanctuary system would result in beneficial effects on physical resources. The following discussion addresses the proposed and alternative actions and individual components (e.g. regulations) of these actions that would contribute to a potential impact. Components of the proposed action or alternatives that do not affect physical resources are not discussed in this section.

Proposed Action – Targeted Regulations

The proposed prohibitions related to discharges, oil and gas development, submerged land disturbance and vessel desertion would all help reduce or eliminate the potential for physical resource impacts that may be associated with activities currently occurring in the expansion area or potentially allowed in the future, and would have an overall beneficial impact on the offshore physical environment. The regulations would reduce the potential for pollution discharge through these various prohibitions. Other regulations would have no impact or would have a negligible effect on air quality, geology, oceanography and water quality.

Air Quality/Climate Change

The proposed sanctuary expansion would have no discernible adverse impact on air quality or climate change as it would have negligible effects on vessel traffic, which is the primary source of air pollutants in the study area.

Implementing the proposed discharge regulations is expected to have a negligible beneficial impact on air quality within the sanctuaries. Discharge regulations could slightly affect how current activities within the sanctuary are conducted and could reduce the amount of discharges from marine vessels, including discharges of liquid or solid pollutants that in-turn can generate air pollutant emissions. If there is a significant reduction in oily wastes from bilges, ballast water or wastes from meals on board vessels, and raw sewage from MSDs, the amount of petrochemicals and other chemicals and compounds that could vaporize and become airborne may be reduced. This could indirectly improve air quality within the sanctuaries by reducing the amount of air pollutants that occur in the expansion area. However, the degree to which this beneficial effect may occur is not known.

One potential concern associated with expanding the sanctuaries is that vessels may need to travel farther to move outside the sanctuary to discharge materials that would be prohibited within the sanctuary boundaries. The additional travel time, if any, could increase the amount of air emissions from vessel engines. However, given the proposed exemption for clean graywater (that would apply to both the existing sanctuary and proposed expansion area) and existing federal and State discharge requirements, the incremental increase in potential travel time would not represent a substantial increase in air emissions. Most large vessels transit through the area, rather than spending substantial amounts of time in the existing or pro-

posed expansion area. These types of vessels would not need to make substantial detours to discharge materials outside of sanctuary waters. Furthermore, Annex VI of MARPOL requires use of energy efficient and low emission engines in marine vessels, which reduces overall emissions. The overall effect on air quality would be minor and less than significant.

The proposed regulations on cruise ship discharges within the expansion area are expected to provide a minor beneficial impact on air quality within the sanctuaries. Though the regulation does not address air pollution and engine exhaust directly, stricter regulations that prohibit cruise ships from discharging liquid and solid wastes into the expansion area are expected to reduce the overall amount of sewage, graywater, blackwater, and other oily and hazardous wastes into the sanctuary, which could become airborne. Reducing the overall amount of discharged wastes would reduce the possibility that these wastes could vaporize and degrade the overall air quality. Therefore, this regulation would have slight, though unknown, beneficial impacts on air quality.

Implementation of the existing sanctuary regulation that prohibits marine vessel owners from deserting vessels adrift, at anchor, or aground in the expansion area could indirectly have a slight beneficial impact on local air quality. When a vessel is deserted, there is a risk of it grounding on the shoreline, breaking apart, and discharging harmful matter (e.g., motor oil) into the marine environment, which could include emissions into the air basin. With the desertion prohibition, the likelihood of these occurrences would be reduced. The proposed action also includes a provision from the existing regulations that would prohibit leaving harmful matter aboard a grounded or adrift and unattended vessel. This prohibition could provide further air quality benefits by reducing the potential for discharge of oil and fuel and associated pollutant emissions, which can negatively impact air quality. This proposed prohibition would result in a decrease in the amount of spilled substances, including those that could become airborne such as oily and hazardous wastes, which would have a slightly beneficial impact on local air quality.

Geology and Oceanography

None of the proposed regulations would have an adverse effect on geology or oceanography. Minor beneficial effects would occur as a result of prohibiting disturbance and construction on the seabed.

Water Quality

The proposed regulations would prohibit discharging within the sanctuary, with certain exceptions (e.g., clean graywater), and would also prohibit discharging or depositing any material or other matter from beyond the boundary of the sanctuary that subsequently enters the sanctuary and injures a sanctuary resource or quality. These two regulations would benefit water quality in the expansion area by reducing the amount of pollutants that enter the water. In addition, the proposed action would help reduce or eliminate potentially hazardous pollutants such as oil, sewage and other harmful chemicals from entering the sanctuaries and potentially causing injury to marine resources or qualities. Potential upland sources of pollution include municipal wastewater outfalls, industrial outfalls, surface runoff (nonpoint source pollution), and oil and hazardous materials spills. Some examples of marine based sources of pollution include discharges from transiting and wrecked ships, and underwater pipelines. This regulation would result in potential direct beneficial impacts on hazardous waste management and hazardous waste disposal, by discouraging practices that could result in hazardous or toxic discharges within the sanctuary boundaries.

In addition to the sanctuary regulations, the expansion area would be subject to federal regulation 33 CFR Part 151, which states that vessels equipped with ballast water tanks must avoid the discharge or uptake of ballast water in areas within, or that may directly affect, marine sanctuaries.

The proposed regulations would prohibit all oil and gas development within the existing and proposed sanctuary expansion area. There are no existing or planned oil and gas production facilities in the vicinity, but this prohibition would eliminate the potential for facilities to be installed within the study area and reduce risk of oil or gas spills or other hazardous materials being deposited into sanctuary waters. This would result in a beneficial impact on water quality in the expansion area.

As described in the air quality impacts subsection, the proposed regulations would prohibit vessels from being deserted in the expansion area and would prohibit leaving harmful matter (hazardous materials or wastes) aboard a deserted vessel. When a vessel is deserted there is a high risk of discharge of harmful matter (e.g., fuel, motor oil) into the marine environment. These regulations allow the sanctuary to take immediate corrective action to remove the deserted vessel and potentially reduce the amount of hazardous materials that enter the sanctuary. The regulations also allow the sanctuary to prosecute the responsible party, collect damages and restore the affected resources. Therefore, implementing these regulations would provide beneficial effects on water quality.

A proposed regulation that has potential to result in adverse impacts on water quality is the new authorization process for both CBNMS and GFNMS. Discharges otherwise prohibited by sanctuary regulations may be allowed via the authorization process in either the existing sanctuaries or proposed expansion area, if a proposed use or activity is approved by another federal, State or local agency. Existing sanctuary regulations do not include this provision and therefore no mechanism exists to allow prohibited uses, unless they qualify for a permit under very limited conditions. Compared to existing conditions, the authorization process could be perceived to allow additional uses and discharges in the existing sanctuary that have been prohibited in the past. This potential indirect impact would be adverse, but not significant, due to the fact that any proposed activity would be subject to approval from the sanctuary and the sanctuary would have the ability to impose conditions to protect sanctuary resources and qualities. Although the authorization process could be used in the expansion area, compared to existing conditions and applicable regulations, this component of the proposed action would not generally allow uses currently prohibited in the expansion area.

The proposed exemption for clean graywater discharges would allow such discharges in both CBNMS and GFNMS. This exemption would represent a change in the existing sanctuaries, where such discharges are currently prohibited. However, there are limitations on this type of discharge and discharges would be distributed throughout the entire sanctuary area. Therefore, the potential for adverse impacts on water quality in the existing sanctuaries would be minor and less than significant and would be offset by the overall beneficial effect of the proposed action's combination of prohibitions on most discharges in the expansion area.

No Action Alternative

The No Action alternative would be to continue to manage the expansion area as it is currently managed under federal and State laws. This would result in no additional impact on physical resources, but would not achieve the benefits of the proposed action.

Existing Regulations Alternative

The regulations relevant to discharges, vessel desertion and submerged lands protection in this alternative are similar to the proposed action and would have similar benefits as described for the proposed action. There is one difference in vessel discharges. The proposed action includes an exemption for clean graywater, however, the existing regulations alternative would not include this provision because it is not in the existing sanctuary regulations for either CBNMS or GFNMS. Therefore, there may be slightly more beneficial impacts for water resources under this alternative.

Another minor difference is that the regulations under this alternative would allow oil and gas pipelines in specific circumstances. If permitted, there would be a potential for hazardous materials discharge related to an oil spill from the pipeline in the event of a pipeline break. Such discharge could impact both air quality and water quality. However, oil and gas pipelines are allowed (with permits) under existing regulations in both the existing and proposed GFNMS boundaries. Therefore, there is no adverse impact compared to existing conditions. Furthermore, no oil or gas facilities are planned in the expansion area.

Implementation of existing regulations would not include the proposed action authorization process. Therefore, the existing regulations alternative may result in a slightly more beneficial impact on water quality than the proposed action due to the fact that there would be less potential for permitting or allowing otherwise prohibited uses under this alternative. It should be noted that the differences in beneficial impacts would be negligible.

Arena Cove Boundary Alternative

By including a larger area of the cove in the sanctuary boundaries, this alternative would have the potential for slightly increased benefits over the proposed action. The proposed vessel discharge and desertion regulations would apply to the entire harbor area, potentially further safeguarding against the discharge/ disposal of wastes and other pollutants.

MPWC Zones Alternative

Impacts would be the same as described for the proposed action. Implementing the alternative MPWC zones would not materially change the impacts, compared to the proposed action.

4.3 Biological Resources

This section presents information on a variety of habitat types found in the study area with a broad treatment of biological communities associated with each habitat, a summary of marine flora, and discussion of specific wildlife resources including sections on fishes, marine mammals, birds, and invertebrates. This section also includes information on sensitive or special status species, and introduced species. The existing biological resources of the region are generally described, and a summary of federal, state, and local authorities pertaining to these resources is provided. The impact analysis presents the standards used to evaluate impacts on biological resources and addresses potential effects of the proposed action on these resources.

The study area for biological resources includes the existing CBNMS, GFNMS and the proposed expansion area for both sanctuaries.

4.3.1 Regional Overview of Affected Environment

Biological resources in the study area are described in several publications and additional information is available from a variety of sources. NOAA staff gathered this information for existing and future management efforts, to monitor conservation objectives, and as part of ongoing resource assessment and research. For a more detailed discussion on biological resources within GFNMS and CBNMS, please refer to the following documents: the updated draft management plans (DMPs), two biogeographic assessments (NOAA 2003 and 2007), the ecological linkages report (Airamé, et al. 2003), as well as the Sanctuary Condition Reports (ONMS 2010 and ONMS 2009, respectively). Website offerings with biological resources data include the website for the Sanctuary Integrated Monitoring Network (SIMoN) hosted by the Monterey Bay National Marine Sanctuary and resource characterizations on each sanctuary's website. In addition, Appendix G of this DEIS contains comprehensive lists of wildlife and plant species known to occur in the proposed expansion area. These lists can be considered as minimum species inventories. The updated draft management plan for each sanctuary also includes species lists that encompass both the existing and proposed sanctuary boundaries.

Some information on habitat suitability and species use of the study area is provided in the above-referenced biogeographic assessments and linkages report (NOAA 2003, NOAA 2007 and Airamé et al. 2003). The biogeographic assessments, which extend to Point Arena, address locally important species and certain special status species of invertebrates, fish, marine mammals, and birds. These assessments help determine species' use and abundance within the proposed expansion area.

The proposed expansion area of CBNMS covers offshore habitats including Bodega Canyon and GFNMS covers coastal and offshore habitats of northern California from Bodega Head, in Sonoma County, to Manchester State Beach, in Mendocino County. The study area includes unique geological and biological features but also shares many features with existing sanctuaries such as the Point Arena upwelling system, the influence of the California Current, a major eastern boundary current, and seasonal weather patterns.

The unique combination of oceanographic patterns and undersea topography create conditions in the study area that support a rich and diverse assemblage of marine species. This includes a wide array of temperate cold-water species with occasional influxes of temperate warm-water species from the south. The species diversity is directly related to local productivity, diversity of habitats and variable oceanic

conditions that are described in the following section, and the location of the study area within a broad biogeographic transition zone providing a gradient of environmental conditions in which the species composition changes from north to south.

As discussed in Section 4.2 (Physical Resources), the Point Arena region serves as an area that originates upwelled, nutrient-rich ocean waters, which are transported by wind driven currents to the existing sanctuaries over a period of five to seven days (see Figure 4.3-1) (Halle and Largier 2011). Upwelling may be widespread at times or localized at upwelling centers or "cells" (e.g., Point Arena). Upwelling offshore of Point Arena delivers deep, nutrient-rich cold water to the surface that supports high productivity along southern Mendocino and Sonoma coasts extending down to Point Reyes, Cordell Bank and the Gulf of the Farallones region. San Francisco Bay is another important source of nutrients and organic matter flowing into the Gulf of Farallones region. These nutrient rich waters support high concentrations of phytoplankton in the Cordell Bank and Gulf of the Farallones region, which in turn support zooplankton and higher trophic species such as whales, fish and birds. Seasonal streams and rivers such as Salmon Creek, Russian River, Gualala River and Garcia River are also important sources of nutrients and organic matter that support high productivity in the region.

Habitat Types

The study area is primarily in the ocean, but includes some aquatic (i.e. freshwater or brackish water), as well as terrestrial habitats along the coastline adjacent to the proposed expansion area. The study area contains a diversity of habitats, including coastal bluffs, estuaries and lagoons, intertidal, subtidal and nearshore waters, continental shelf and slope and offshore waters. The following discussion focuses on the habitats in and adjacent to the proposed expansion area.

Coastal Bluff Vegetation

Coastal bluff habitat occurs shoreward of the high tideline. Bluffs along the coast rise steeply from intertidal areas, and include vegetation growing from the higher high tide line to the bluff tops. These are harsh environments where plants must withstand strong winds with high salt content. Species within the coastal bluff vegetation are categorized according to three communities described by Holland (1986): northern foredune, central dune scrub, and northern coastal bluff scrub. Due to the prevalence of invasive nonnative species in this California habitat, much of the vegetation on the cliff top consists of nonnative plants. Upland from the coastal bluffs, areas of dense forest are interspersed with wave cut terraces, rolling grasslands and agricultural lands.

Estuaries and Lagoons

Estuaries and lagoons are very productive coastal ecosystems that play a key role as nursery habitat for many coastal invertebrates and fishes. They are also an important part of the Pacific Flyway, which hosts thousands of shorebirds and waterfowl on their migrations (Ramer 1991). Anadromous species such as salmonids and lampreys must pass through estuaries on their migration pathways (Boesch and Turner 1984). Steelhead Trout in the north-central coast spend a significant part of their juvenile phase in coastal estuaries (McEwan and Jackson 1996). Since estuaries and lagoons serve as important habitat linkages among marine, aquatic and terrestrial habitats, their condition is closely tied to the condition of the surrounding watershed. Estuaries provide critical ecosystem services such as filtering sediments and nutrients from the watershed, stabilizing shorelines, and providing flood and storm protection.

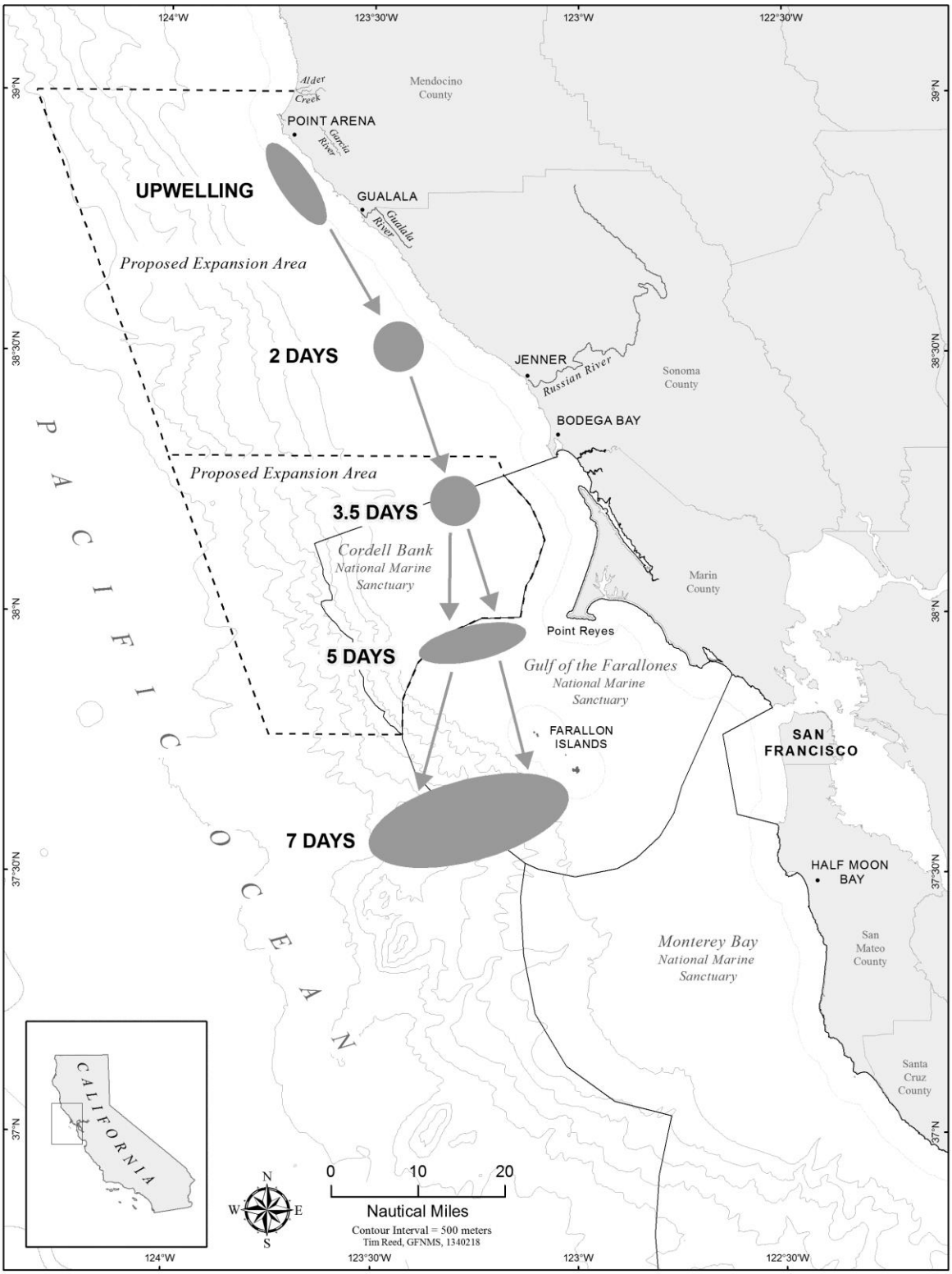

Figure 4.3-1. Southward Flow of Water from Upwelling Center at Point Arena

This schematic illustration developed by J.L. Largier from High Frequency radar observed flows (Halle and Largier 2011) shows typical surface flow patterns that transport newly upwelled water away from the perennial upwelling center at Point Arena. As the water is exposed to light, a phytoplankton bloom develops, with significant concentrations after a few days and maximum concentrations expected after about a week, when the water is in the vicinity of Cordell Bank and the Gulf of Farallones.

Estuaries at the mouth of the Garcia River (southern Mendocino County), the Gualala River (northern Sonoma County/southern Mendocino County), and the Russian River (central Sonoma County) are located in the study area. The Garcia River estuary forms behind a seasonal sandbar where the Garcia River meets the Pacific Ocean at Manchester State Beach. The Garcia River drains a mostly forested, 114-square-mile watershed where forestry, dairy farming, livestock grazing, and gravel mining take place. The Garcia River estuary hosts Steelhead and Coho Salmon and extends upriver to the confluence of Hathaway Creek.

The Gualala River drains approximately 298 sq miles of western Mendocino and Sonoma Counties and enters the Pacific Ocean at Gualala. During summer months, a sand bar typically forms across the mouth of the estuary which blocks the flow of tidewater creating a coastal lagoon (NOAA 2010).The Gualala River has small populations of Steelhead and Coho Salmon and the estuary serves as a nursery area and migration corridor for these species. Other species of fish found in the estuary include Roach, Coast Range Sculpin, Prickly Sculpin, Starry Flounder, and Pacific Staghorn Sculpin. Water quality in the watershed has suffered due to impacts from upland forestry and agriculture (Klamt et al 2002).

The Russian River drains an area of 1,485 sq miles in Mendocino and Sonoma Counties. The Russian River estuary is subject to frequent closures by the formation of a sandbar across the estuary mouth in the spring, summer, and fall. Tidal extent in the estuary can be up to 7.3 miles upriver and 800 feet wide. The closure of the estuary temporarily eliminates tidal exchange and creates ponding of the river, which results in a gradual increase of the water level in the estuary. The County of Sonoma removes a portion of the sandbar when necessary to limit property damage from flooding. Twenty-four species of fish including threatened populations of Steelhead, Chinook, and Coho Salmon, eight species of crab, and five species of shrimp are found in the Russian River estuary. This estuary also has a large harbor seal haul-out (Sonoma County Water Agency 2005).

Intertidal

Intertidal habitat, by definition, is found between the lowest and highest tidal level. This transitional area between sea and land is the strip of shore between the uppermost surfaces exposed to wave action during high tides and the lowermost areas exposed to air during low tides. Intertidal habitats vary in substrate type and the degree of exposure to surf. Bottom habitat types include fine muds, sand, gravel, shale, cobble, boulders, and bedrock. Rocky shores are found throughout the region, with a limited number of beaches. The intertidal zone represents a relatively small percent of the expansion area, but supports a diverse assemblage of marine life including sponges, tunicates, hydroids, mussels, crabs, sea stars, sea anemones, many different algae species, and many species of fishes. Surfgrass (*Phyllospadixs couleri)* is an abundant habitat forming plant found in the high-energy low intertidal and shallow subtidal rocky bottoms along exposed outer coastlines.

Subtidal Nearshore

Subtidal nearshore habitat refers to the area from the lowest low tide line to about 100 feet, the end of the photic zone where light penetrates to support photosynthetic activity (CDFG 2007). The substrate can be sand, mud, or rock providing essential habitat for a thriving biological community in the study area.

In less than 60 feet of water, the kelp forest is a prominent nearshore habitat that is defined and influenced by canopy-forest forming species of kelp (Shaffer 2002), which is predominantly bull kelp (*Nereocystis*

lutkeana). Kelp beds are a conspicuous nearshore feature in the study area and fronds from the plants cover extensive areas on the ocean surface in areas of predominantly rocky substrate. The holdfast (roots), stipe (stem) and fronds of the bull kelp create structure and habitat from the seafloor to the surface. Kelp beds are persistent over time but exhibit marked seasonal and annual changes in the extent of the canopy, primarily due to winter storm activity and changing oceanographic conditions such as El Niño events. Studies have also shown that distribution and abundance of kelp beds and successional processes are affected by climatic and oceanographic changes, as well as by grazer abundances and fishing. Grazers, such as urchins, can play a large role in the abundance and distribution of kelp and urchin populations can, in turn, be directly controlled by their predators, e.g., sea otters, and by commercial urchin fishing. Kelp forests are one of the most productive marine habitats along the coast of California and provide habitat, feeding grounds, and nursery areas for many species of fishes and invertebrates. Juveniles of many nearshore rockfish species occur in the mid-water or upper kelp canopy. Juveniles and adults of many nearshore rockfish species, as well as Cabezon, greenlings, Lingcod, and many other species, associate with bottom habitats in kelp forests (CDFG 2007). In the study area, seals, sea lions, and (rarely) sea otters utilize nearshore environments for forage, shelter, and reproduction.

Continental Shelf and Slope

The continental shelf extends from the limit of the photic zone to the shelf break at about 328 to 656 feet (100 meters to 200 meters) deep. The shelf usually ends at a gradual slope called the shelf break, where the bottom sharply drops forming the continental slope. The continental slope together with the continental shelf is called the continental margin, which includes a variety of productive habitats. Soft sediment areas of the continental shelf and slope provide habitat for a diverse array of benthic organisms. Some areas on the shelf have dense aggregations of sea whips and brittle stars with sea pens, sea stars, and anemones also present. Dungeness crab are common residents of soft bottom shelf habitat. The continental margin makes up the majority of the study area.

The proposed expansion area consists of a broad continental shelf, which narrows to approximately 17 miles (15 nm west of Point Arena). Within the slope and shelf area are several notable geological features of hard substrate and rocky reef: the “Football” area 20 miles (17.5 nm) west of Jenner in Sonoma County; the Point Arena hard substrate area 8 miles (7 nm) west of Point Arena; the “Biogenic Area 12” 37 miles (32 nm) west of Salt Point; and the sloping edges of the continental shelf dissected by deep water canyons, such as Bodega and Arena Canyons. Not many research surveys have been conducted on these features, yet it is suspected that benthic communities on these features are similar to those found within the existing boundaries of CBNMS and GFNMS. Limited surveys of Bodega Canyon found that much of the hard substrate investigated was draped with a layer of mud so that invertebrate cover on the canyon edge was sparse. On the exposed rock substrate corals, sponges and an assortment of other benthic organisms were found (Fruh et al. 2013). Large aggregations of pelagic birds and marine mammals are often observed foraging in close proximity to Bodega Canyon. The distribution and abundance of these predators is an indication that the canyon is a very productive marine area.

Surveys of CBNMS and GFNMS have shown that deep reef areas provide critical habitat for a unique assemblage of fishes and invertebrates that are very different from shallow water assemblages. Rocky substrate areas are also known fishing spots for a variety of rockfishes and Lingcod.

Offshore Waters

Offshore waters refer to open water or pelagic areas seaward from the photic zone (CDFG 2007). Oceanographic conditions such as currents, water masses, and temperature strongly influence marine biodiversity in this open ocean environment. Variation in factors such as water temperature, upwelling and currents determine areas of productivity where krill, squid, anchovy, seabirds, and marine mammals congregate in the pelagic ecosystem (Forney, 2000; Yen et. al., 2004). Oceanographic features include fronts where two water masses meet, recirculation eddies in the lee of headlands or islands, upwelling plumes, river or bay, and outflow plumes. Many of these oceanographic features can be associated with high abundances and biodiversity hotspots (CDFG 2007, Yen et al 2004). In addition, transport patterns associated with oceanographic features can significantly affect recruitment patterns of fish and invertebrates in intertidal and nearshore communities (Farrell et al 1991; Roughgarden et al 1991; Wing et al 1995, CDFG 2007). Presence of organisms in this open water habitat is highly variable and patchy because many have limited ability to swim and generally drift with ocean currents. Gelatinous zooplankton such as ctenophores, pteropods, siphonophores, jellies and salps are a good example of this condition. In deeper water near the continental shelf break, there is a nightly migration of krill, copepods, myctophid fish and other organisms (collectively called the scattering layer) from daytime use of the deeper water column closer to the bottom up into the water column. During the day, planktonic life in the upper water column in this offshore area can be relatively sparse, but this mass migration every night transforms the upper water column into a cacophony of life as prey and predators emerge under the cover of dark. This nightly ascent into the water column is a significant migration of biomass and an important link in the ecology of offshore waters.

Marine Flora

The nutrient rich coastal waters in the proposed expansion area support a healthy community of marine flora that is a significant component of the nearshore ecosystem. A diverse array of green, brown and red algae occurs on most rock surfaces from the intertidal zone to a depth of approximately 70 feet. Throughout the proposed expansion area, at least 22 species of green algae (Division Chlorophyta), 28 species of brown algae (Division Phaeophyta), 138 species of red algae (Division Rhodophyta), and two species of vascular plant (Division Tracheophyta) are known to occur (MARINe 2013, PISCO 2013, and Roletto et al. 2013).

As described in the subtidal nearshore subsection, dense forests of bull kelp dominate the nearshore area (15 to 60 feet water depth) providing shelter and food for scores of fishes and invertebrates, providing some of the most productive habitats along the West Coast (Tegner and Dayton 2000). Below the bull kelp canopy, several species of brown algae from the Laminariaceae family form a sub-canopy 2 to 3 feet off the seafloor. Encrusting and upright articulated coralline red algae cover rock surfaces and are intermingled with a diverse array of other algae in study area kelp forests. These kelp forests provide important feeding and breeding area for a wide variety of fish and invertebrates including juvenile and adult rockfish, Cabezon *(Scorpaenichthys marmoratus)* and Lingcod *(Ophiodon elongatus)* (Foster and Schiel 1985 and Allen et al. 2006). Rocky shores at minus tides are an explosion of texture and color provided by a diversity of marine flora in this region.

Along the shoreline in the lower intertidal zone, dense beds of the sea palm (*Postelsia palmaeformis*) occur in areas where the offshore kelp beds are sparse and high wave energy reaches the shoreline. Sea

palms are harvested in the study area. Surfgrass *(Phyllospadix scouleri)* can be abundant on intertidal and shallow subtidal rocky bottoms along exposed outer coastlines.

Wildlife Resources

The proposed expansion area hosts a wide range of fish and wildlife resources, including several special status species. Appendix G contains lists of the species that occur in the study area.

Fishes

Fish communities in the proposed expansion area are similar to those inhabiting the current GFNMS and CBNMS and described in the sanctuaries' respective condition reports (ONMS 2009, ONMS 2010), and the FEIS for the JMPR (NOAA 2008). This includes shelf and slope species complexes for soft and hard bottoms, mid-water species, and migratory species such as salmon and Albacore Tuna. Many of the near-shore species inhabiting intertidal and shallow subtidal (less than 60 feet water depth) are also similar.

More than 180 species of fish have been documented in the CBNMS (Eldridge 1994, NMFS unpubl. data, Cordell Bank sanctuary unpubl. data), with rockfish dominating the fish community in both numbers and biomass. It is probable that hard bottom areas on the continental shelf in the proposed expansion area have similar fish composition to that observed on Cordell Bank. Several rockfish species (Sebastes spp.) probably dominate in numbers and biomass near deep reef areas. Areas with rocky structure on the shelf are likely important recruitment areas for first year rockfish settling out of the water column as they move from a pelagic to benthic phase in their early life history.

Limited scientific study has been focused on the ichthyofauna of the study area's soft-bottom habitat; however, considerable information has been gathered and analyzed on the fish assemblages that inhabit the continental shelf and slope habitats of the northeastern Pacific Ocean (Allen 2006). While soft-bottom areas are predominantly the domain of flatfishes, skates, and rays, numerous fusiform (spindle-shaped) fishes such as croakers, rockfishes, sculpins and surfperches also thrive in this habitat. Fishes commonly found in the middle shelf include: Big Skate (*Raja binoculata*), Longspine Combfish *(Zaniolepis latipinnis)*, Shortbelly Rockfish *(Sebastes jordani)* and Pacific Sand Dab *(Citharichthys sordidus)*. On the outer shelf, fishes more commonly seen in research collections include the Stripetail Rockfish *(Sebastes saxicola)*, Greenstriped Rockfish *(Sebastes elongatus)* and Slender Sole *(Lyopsetta exilis)*. Beyond the shelf break in the upper slope region, fishes most commonly found include poachers, Splitnose Rockfish *(Sebastes diploproa)* and Sablefish *(Anoplopoma fimbria)*. Among the fishes that inhabit all three depth zones are Lingcod (*Ophiodon elongatus*), Spotted Cusk Eel *(Chilara taylori)*, Plainfin Midshipman *(Porichthys notatus)* and Dover Sole *(Microstomus pacificus)*.

Much of the water column habitat within the proposed expansion area overlies the continental shelf and comprises the coastal pelagic realm. Fishes which occupy the epipelagic zone (depth to 656 feet) are a mixed group of larger, slow growing, longer-lived species and active, fast growing, shorter-lived fishes (Allen and Cross 2006). Fishes commonly placed in the former group include sharks (Blue Shark *Prionace glauca*, White Shark *Carcharodon carcharias*, Thresher Shark *Alopias vulpinus*), Jack Mackerel *(Trachurus symmetuicus)*, Pacific Mackerel *(Scomber japonicus)* and Pacific Hake *(Merluccius productus)*. The latter group occupying the epipelagic zone is composed of early life history stages of many fishes (including Lingcod, rockfishes and many flatfish species) as well as the commercially important Northern Anchovy

(Engraulis mordax) and Pacific Sardine *(Sardinops sagax)*. Anchovies and sardines, which are an important prey for many coastal predators and a critical link in the coastal food web, have alternated as the most abundant fishes of the coastal pelagic realm off California throughout recent history. Abundance of these short lived fishes is related to oceanographic cycles within the region. For example, the alternating 20 to 30 year periods of cool and then warm phases in the Pacific Ocean track fluctuations in the alternating abundances of anchovies (cool periods) and sardines (warm periods) (Chavez et al. 2003). Other fishes that inhabit the epipelagic zone include species that frequent the sanctuaries on a seasonal basis, such as Albacore Tuna *(Thunnus alalunga)* and Chinook *(Oncorhynchus tshawytscha)*, and Coho Salmon (*O. kisutch*). Mesopelagic fishes (those found below the epipelagic zone to depths of 3280 feet) are relatively small, slow-growing and long-lived. Representatives of this group include the lantern fishes, hatchet fishes and deep-sea smelts. Many mesopleagic fishes make nocturnal vertical migrations to feed.

As stated above, several species of rockfish settle out of the water column and spend their first year of life on rocky reefs, including those with kelp beds. Some species remain in the kelp beds, other species migrate into deeper water for the adult phase of their lives. The most common juvenile rockfish observed in kelp beds includes Blue, Black, Yellowtail and Widow Rockfish in spring and the Copper/Gopher complex in late summer. Other juvenile species regularly observed include Canary, Bocaccio and Shortbelly. Several species of adult rockfish are commonly seen in kelp beds — Blue, Black, China, Gopher, and other species and species groups include Lingcod, Cabezon, Kelp Greenling, cottids, surf perches, gobies, gunnels, and tubesnouts eel.

A small group of specialized fishes is found in tide pools of rocky intertidal habitats. Representative species include the Monkey-Face Prickleback *(Cebidichthys violaceus)*, Rock Eel *(Pholis gunnellus)*, Rockweed Gunnel *(Xererpes fucorum)*, Blackeye Goby *(Coryphopterus nicholsii)*, Dwarf Surfperch *(Micrometrus minimus)*, juvenile Cabezon *(Scorpaenichthys marmoratus)*, Tidepool Sculpin *(Oligocottus maculosus)*, Tidepool Snailfish *(Liparis florae)* and blennies (Airamé, S., et al. 2003).

Based on recommendations within amendment 19 of the Pacific Coast Groundfish Fishery Management Plan, NOAA's National Marine Fisheries Service (NMFS) implemented in 2006 essential fish habitat (EFH) for groundfish. See Section 4.2.2 (Regulatory Overview) for additional details regarding groundfish management.

Salmonid Species

Steelhead Trout and two species of salmon — Coho and Chinook — are considered endangered or threatened under the Endangered Species Act in the study area. The three major streams in the study area that support salmonid runs are the Garcia, Gualala and the Russian River. The Garcia and Russian River support populations of all three species while the Gualala supports runs of Steelhead Trout (CDFG 2007). Many of the smaller coastal streams likely support populations of Steelhead. The marine waters in the proposed expansion area are important for these fishes during the ocean phase of their life history, where they feed and grow to maturity before returning to coastal streams to spawn. Salmonid species originating from the various runs in California described below may spend part of their life cycles within the proposed sanctuary expansion area, as may salmonids from runs elsewhere.

Salmon. Two evolutionarily significant units (ESUs) of Chinook Salmon (*O. tshawytschus*) are listed as threatened. One is the California Coastal ESU, which includes the Russian River, where populations are

slowly increasing. The other threatened Chinook Salmon ESU is the Central Valley Spring Run ESU, which has only three wild populations left in Mill, Deer, and Butte Creeks (fish have also recently returned to Big Chico Creek), mostly due to blocked access to traditional spawning areas by dams, which impair salmon migration. The Sacramento River Winter Run ESU, which was greatly affected by the construction of Shasta Dam, is listed as endangered (CDFG 2007). One ESU of Coho Salmon *(O. kisutch*), the Central California Coast ESU, is listed as endangered. This ESU runs from Punta Gorda in the north (just south of Cape Mendocino) to the San Lorenzo River in Santa Cruz County. Of the 133 historical runs, only 56 (or 42%) are now considered occupied. The highest occupation is in Mendocino County (62% of historical runs), followed by Marin County (40%), and Sonoma County (4%). Central California Coast Coho Salmon return to major rivers and creeks in the north central coast study region for this species, including the Garcia, Gualala, and Russian Rivers, and Tomales Bay creeks, as well as numerous smaller creeks. Since 2001, the Russian River Coho Salmon Captive Broodstock Program has been re-establishing Coho in the Russian River. The program captures, rears, and spawns Coho broodstock, and young fish are released in area tributary streams. Growth and survival is monitored until they move downstream and into the Pacific Ocean (CDFG 2007a). It is likely that all of these endangered runs of salmon depend on the ocean waters of the proposed expansion area for food and shelter during the ocean water phases of the salmon's lifecycle.

Steelhead Trout. Three distinct population segments (DPS) of Steelhead Trout (*O. mykiss*) are listed as threatened in the north-central coast study region for this species. The Northern California DPS ranges from Redwood Creek in Humboldt to the Gualala River and is found in both the Garcia and Gualala Rivers. The Central California Coast DPS ranges from the Russian River, which probably hosted the largest historic population, to Soquel Creek in Santa Cruz County, and includes some tributaries in San Francisco and San Pablo Bays. Both the Northern California and Central California Coast DPSs have benefited from a prohibition of ocean harvest of Steelhead Trout enacted in 2002.

White Shark

White Sharks *(Carcharodon carcharias)* have a wide range and are known to inhabit the study area. Studies estimate the number of adult White Sharks within the northeastern Pacific area at approximately 3000 individuals (NMFS 2013). Subsisting mostly on marine mammals and scavenged large animal carcasses, White Sharks often feed off the Farallon Islands, especially during the late summer and fall. In 1994, the state of California placed White Sharks on the list of species protected in state waters and in 1997 California state law permanently prohibited take of White Sharks. In July 2013, NMFS denied a petition to list the northeastern Pacific population of White Sharks as threatened or endangered. After scientific review, it was determined that the population was considerably larger than first reported.

Marine Mammals

At least 16 species of cetaceans of which five are endangered — the Blue Whale *(Balaenoptera musculus)*, Fin Whale (*Balaenoptera physalus)*, Humpback Whale *Megaptera novaeangliae)*, Killer Whale (*Orcinus orca)*, and Sperm Whale (*Physeter macrocephalus*), six species of pinnipeds of which one is threatened — the Guadalupe fur seal (*Arctocephalus townsendi*), and two species of otters, a river otter (*Lontra Canadensis)* and the southern sea otter (*Enhydra lutris nereis)*, which is threatened, occur within the

study area (see Appendix G for species list, Pyle et al. 2005, NOAA 2007, Barlow et al. 2008, FMSA 2013, and PRBO 2013); ten of these species use the study area during their breeding season.

Gray whales *(Eschrichtius robustus)*, pass through the area during the winter and spring months on their annual migrations between Arctic feeding grounds and Mexican breeding areas. The Dall's porpoise *(Phocoenoides dalli)*, Pacific white-sided dolphins (*Lagenorhynchus obliquidens)*, and northern right whale dolphins (*Lissodelphis borealis)* are commonly seen in the offshore waters, along with Eastern Pacific humpback *(Megaptera novaeangliae)* and blue whales *(Balaenoptera musculus)*. Large numbers of humpback whales and blue whales feed during the summer and fall months and use the study area as a destination feeding area.

The harbor porpoise *(Phocoena phocoena)*, a species widely distributed in coastal waters but rarely seen offshore, is regularly observed within the study area. Other cetaceans observed in the Sanctuary include Risso's dolphins *(Grampus griseus)* and killer whales *(Orcinus orca)*.

The harbor seal *(Phoca vitulina)* is the most abundant pinniped in the study area, with numerous breeding and haul-out areas along the coast. The largest rookeries are located at Goat Rock and the mouth of the Russian River, Fort Ross, and The Sea Ranch (NOAA 2007). California sea lions (*Zalophus californianus*) do not breed within the study area but use the numerous offshore rocks and sea stacks dotting the coastline of the study area. The largest haul-out areas for California sea lions are found at Fort Ross and Fish Rocks. Northern fur seals *(Callorhinus ursinus)* are also abundant in the offshore areas in late fall and winter during their foraging season. Prior to their local extirpation by Russian fur traders in the 1800s, northern fur seals bred along offshore islands and rocks along northern California. Since 1996, a small breeding colony has reestablished at the Farallon Islands (Pyle et al. 2001). Most of the year, fur seals are pelagic and only come to shore during their summer breeding season at the Channel and Farallon Islands.

Steller sea lions *(Eumetopias jubatus)* decreased drastically in California during the 1950-1980s, but the breeding rookeries at Año Nuevo Island and the Farallon Islands have been stabilizing for the past ten years (Pitcher et al. 2007). Steller sea lion populations in the California, Oregon and Washington area were delisted from the threatened species list in late 2013. Fish Rocks, Northwest Cape Rocks, and Russian River Rock are important rookeries and haul-outs for Steller sea lions within the study area. The sea lions' winter haul-out grounds include Point Reyes and offshore rocks along the Sonoma County coast. Guadalupe fur seals *(Arctocephalus townsendi)* are a threatened species that are rarely found within the study area. The main populations of Guadalupe fur seals are in southern California and Guadalupe Island off of Baja, Mexico. There are no known rookeries for elephant seals *(Mirounga angustirostris)* within the study area. Juvenile elephant seals will occasionally haul out at Goat Rock and are occasionally observed offshore. Southern sea otters (*Enhydra lutris nereis*) were once abundant along the entire northern coast of California including the study area. Russian fur traders extirpated all sea otters from the northern California coast and now only a few sea otters are rarely seen north of San Mateo County (Stewart and Praetzellis 2003).

Birds

The waters throughout the proposed expansion area provide valuable habitat for a variety of seabirds and coastal birds. At least 149 species of seabirds and coastal birds, of which one endangered species and three threatened species, occur throughout the study area (Pyle et al. 2005, NOAA 2007, Barlow et al.

2008, FMSA 2013, and PRBO 2013). Approximately a third of these species use the expansion area during their breeding season. The study area includes important habitat for numerous shorebird species. Shorebirds commonly seen foraging along the shoreline include Marbled Godwits *(Limosa fedoa)*, Western Sanderlings *(Calidris alba)*, and Black Oystercatchers *(Haematopus bachmani)*. Another bird found in the area is the Western Snowy Plover (*Charadrius alexandrinus nivosus*), whose threatened status has resulted in significant resource management actions including restrictions on access or types of use in some shoreline areas.

The Marbled Murrelet *(Brachyramphus marmoratus)* is another bird species found in the study area that is listed as threatened under the Endangered Species Act. The Marbled Murrelet is a unique seabird because it nests inland on the branches of coastal, old growth coniferous trees, often over a hundred feet above the ground (Leet et al. 2001).

Large offshore rocks and coastal bluffs are nesting areas for several seabirds such as cormorants, Western Gulls (*Larus occidentalis*), and Pigeon Guillemots (*Cepphus columba*). Fish Rocks is one of the top breeding colonies in the study area, supporting nine breeding seabird species (NOAA 2007). Other locations within the study area significant to breeding seabirds include Gualala Point Island, Russian Gulch, and Arched Rock located along the Sonoma Coast State Beaches.

Migrant seabirds come to the area in the summer and late fall to feast on zooplankton (krill and copepods) and fishes that thrive in the productive upwelled waters. One of the most abundant seabird species, the Sooty Shearwater *(Puffinus griseus)*, comes through California waters by the hundreds of thousands, mostly from New Zealand breeding colonies. Large numbers of Black-footed Albatross *(Phoebastria nigripes)* visit the region from their nesting colonies in Hawaii (Leet et al. 2001). An individual Laysan albatross *(Phoebastria immutabilis)* frequents the harbor at Arena Cove, which is unusual for this normally pelagic species. The study area is also a significant foraging region for the Rhinoceros Auklet *(Cerorhinca monocerata)*, the Northern Fulmar *(Fulmarus glacialis)*, various storm-petrel species (family Hydrobatidae), phalaropes (family Scolopacidae), and many species of gulls (family Laridae). Bald Eagles *(Haliaeetus leucocephalus)* and Osprey *(Pandion haliaetus)* may occur year-round hunting the waters, cliffs, sand dunes, and beaches within the study area.

Researchers from Point Blue Conservation Science (formerly PRBO Conservation Science) developed habitat association models for 16 species of seabirds using information from at-sea surveys carried out over a 12-year period and found persistent important seabird habitat "hotspots" within the study area, including off Point Arena (Nur et al. 2011).

Invertebrates

The intertidal community contains a diverse array of invertebrates competing for space including sponges, tunicates, hydroids, abalone, barnacles, limpets, mussels, sea anemones and sea urchins. Mobile invertebrates, such as sea stars, snails, and crabs, often hide in crevices or under rocks, emerging to graze on algae or prey on other animals (ONMS 2010).

Sonoma and Mendocino coasts support healthy populations of red abalone *(Haliotis rufescens)*.This slow-growing mollusk is an important part of the intertidal and subtidal community living to water depths of about 100 feet. It takes an abalone an average of ten years to reach a diameter of seven inches. A die-off

of abalone and other marine invertebrates associated with a harmful algal bloom (red tide) occurred in late August 2011 along the Sonoma County coast. Concern over the impact of the die-off on abalone populations prompted an intensive monitoring effort by the California Department of Fish and Wildlife. Survey results show a 60 percent decline in density from Sonoma County study sites; low densities at the Fort Ross site are of particular concern (CDFW 2012). Population numbers of red abalone in the study area are comparatively higher because their natural predators, sea otters, are rarely found north of San Francisco. Their main predators currently are recreational free divers who avidly harvest red abalone.

Red sea urchins *(Strongylocentrotus franciscanus)* are subtidal herbivores that play an important ecological role in the structure of kelp forest communities. In northern California urchins feed on bull kelp and other algal species. Tagging studies reveal that red urchins are long-lived; reaching 50 years. Large individuals may be older than 100 years (Leet 2001).

Rocky features and ridges in the study area may be thickly covered with sponges, anemones, hard and soft corals, hydroids, tunicates, holothurians, and gastropods. Soft bottom habitats also support a thriving community of benthic invertebrates. Adapted to life in and on a shifting substrate, these animals are either buried in the sediment, like polychaete worms and clams, or are mobile on the surface, such as sea stars and Dungeness crabs *(Cancer magister)*(ONMS 2009). Dungeness crab are an important commercial and recreational fishery in the proposed expansion area. The west coast Dungeness crab fishery is considered the most sustainable large-scale commercial crab fishery in the world (NOAA 2008).

The continental slope and canyon systems in the study area support deep-sea corals and sponges among other deep water species. A broad-scale characterization of deep-sea coral and sponge habitats and communities was conducted in Bodega Canyon and on the nearby continental slope during summer of 2011 using an autonomous underwater vehicle. Nine taxa of sponges and eight taxa of corals were observed. The most abundant corals encountered included mushroom corals *(Anthomastus ritteri)* and various fan-like gorgonians (*Parastenella* spp. and *Plumerella* spp.). The most abundant sponges were branching and vase sponges (Fruh et al. 2013). Deep-sea corals and sponges are long-lived, slow growing, fragile animals; characteristics that make them particularly vulnerable to physical disturbance such as bottom contact fishing gear and effects from climate change and ocean acidification. Additionally, the complex structures and forms of deep-sea coral and sponges have shown these species are of potential value for commercially important fishes and other invertebrates as habitat for protection from predators and for enhanced feeding opportunities.

A myriad of gelatinous zooplankters inhabit the pelagic water column, including moon jellies *(Aurelia aurita)* and sea nettles *(Chrysaora fuscescens)*, as well as more obscure invertebrate creatures such as hydromedusae, ctenophores, siphonophores, pteropods, and heteropods. These animals feed and are preyed upon in the water column of the study area (ONMS 2009). These gelatinous invertebrates are an important food source for fishes and leatherback sea turtles *(Dermochelys coriacea)*.

Two species of krill (*Thysanoessa spinifera* and *Euphausia pacifica*) are important trophic links in the study area ecosystem. These small, shrimp-like crustaceans are referred to as “keystone” species because they are critical prey for many other species. Each spring and summer, massive swarms of krill provide food for many species in the study area ecosystem including seabirds, fishes and whales (ONMS 2009).

Introduced Species

Introduced species (also known as non native, or exotic species) are present in the marine and estuarine environments and can be a major environmental threat to living resources and habitats in the proposed expansion area. Human introduction of non native species (also sometimes called aquatic nuisance species or fouling organisms) into waters where they are not already established is an issue that has received much attention in recent years. Once introduced to marine ecosystems to which they are not native, introduced species can pose a significant threat to water quality and are capable of disrupting the ecosystems.

The ONMS uses the term "introduced species" to describe a non-native species or any organism that has been genetically modified. Introduced species are known to threaten the diversity or abundance of native species (especially threatened and endangered species), alter species composition, and interfere with the ecosystem's function, often threatening the ecological stability of the infested waters. They may cause local extinction of native species either by preying on them directly or by out-competing them for prey. For example, the European green crab, now found in Bolinas Lagoon, Tomales Bay, Estero de San Antonio, Estero Americano, and Bodega Harbor, preys on the young of valuable species (such as oysters and Dungeness crab) and competes with them for prey and suitable habitats. Introduced species may also cause changes in physical habitat structure.

Presently, there are no reports of known introduced species along the outer coast of Sonoma and Mendocino Counties within the study area; this may reflect a low presence of estuarine habitat, marinas, docks, or piers (MARINe 2013, PISCO 2013, and UCD 2013),[15] or relatively little searching for such species from trained scientists. Introduced species are known to occur in the coastal dune habitat adjacent to the study area. Introduced dune plants limiting native dune species include hottentot fig *(Carpobrotus edulis)*, sea fig *(Carpobrotus chilensis)*, Uruguayan pampas grass *(Cortaderia selloana)*, and European beachgrass *(Ammophila arenaria)*. Even though these species are not within the boundary of the proposed expansion area, they do have negative impacts on the sandy beach ecosystem by changing the availability of foraging, roosting and nesting areas for shorebirds, deposition of beach wrack, and long shore sediment transport (UCD 2013).

Along the outer coasts of Sonoma and Mendocino Counties, commercial vessels would be the most likely future contributor of introduced species, from ballast water and fouling organisms on vessel hulls. Other possible future sources of introduced species in the study area could be from commercial and recreational vessels transiting the study area after having been in such locations as Bodega Harbor, San Francisco Bay or Monterey Harbor, where introduced species are known to exist and colonize on vessel hulls.

Once established, introduced species can be extremely difficult to control or to eradicate. Throughout the nation, hundreds of federal programs, state organizations, international organizations, and non-profit organizations have established databases, community outreach, monitoring, eradication, research and education programs, but none of these programs are operative within the study area. Future dune restoration programs to eradicate invasive dune plants could improve sandy beach habitat.

[15] Arena cove contains a pier and other harbor facilities; it is included in one boundary alternative, but is excluded from the proposed action boundary.

4.3.2 Regulatory Overview

There are numerous federal and state laws and regulations providing protection of biological resources in the study area. An overview of some of the primary regulations and regulating agencies are summarized below (note, the following does not comprise a comprehensive list).

Federal Regulations

Endangered Species Act (ESA), 16 U.S.C. §§ 1531-1544

The ESA protects plant, fish and wildlife species (and their habitats) that are listed as endangered and threatened. Species are listed as endangered if found to be in danger of extinction throughout all or a significant portion of their ranges; species are listed as threatened if they are likely to become endangered within the foreseeable future. The ESA also protects designated critical habitat for listed species, which are areas of physical or biological features essential to the conservation of the species and which may require special management considerations. The ESA requires federal agencies to consult with the U.S. Fish and Wildlife Service (USFWS) and/or NMFS, as applicable, before initiating any action that may affect a listed species.

Magnuson-Stevens Fishery Conservation and Management Act (MSA), 16 U.S.C. § 1801 et seq.

Under the MSA, the U.S. claimed sovereign rights and exclusive fishery management authority over all fish, and all Continental Shelf fishery resources, within the Exclusive Economic Zone (EEZ) (within 230 miles [200 nm] of the shoreline). The MSA established a procedure for authorizing foreign fishing, and prohibited unauthorized foreign fishing within the EEZ.

The MSA also established national standards for fishery conservation and management within the EEZ, and created eight Regional Fishery Management Councils composed of state officials with fishery management responsibility, the regional administrators 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 (FMPs) describe the fisheries and contain necessary and appropriate conservation and management measures, applicable to foreign vessels in U.S. waters and fishing by U.S. vessels. The plans are submitted to the Secretary of Commerce, who has delegated to NOAA approval of the plans. If approved, NMFS promulgates implementing regulations. NMFS may prepare Secretarial FMPs if the appropriate Council fails to develop such a plan.

Of particular relevance to this EIS is the Groundfish FMP. Amendment 19 was prepared by NMFS and the Pacific Fishery Management Council (PFMC) to comply with Section 303(a)(7) of the MSA by amending the Pacific Coast Groundfish FMP to:

- Describe and identify EFH for the fishery;
- Designate Habitat Areas of Particular Concern (HAPC);
- Minimize to the extent practicable the adverse effects of fishing on EFH; and
- Identify other actions to encourage the conservation and enhancement of EFH.

On May 11, 2006, NMFS published a final rule to implement regulatory provisions of Amendment 19 to the Pacific Coast Groundfish FMP (71 FR 27408). This rule implemented management measures to minimize adverse impacts on EFH from fishing, including gear restrictions and area closures. There are two Bottom Trawl Closed Areas in the study area: Point Arena North and Point Arena South Biogenic Area. There is also a bottom trawl footprint closure that prohibits the use of bottom trawl gear in depths greater than 700 fathoms to the outer extent of groundfish EFH (3,500 m) or the seaward extent of the EEZ, preventing the expansion of the use of this gear type into area where its historical use has been limited.

Fish and Wildlife Coordination Act and Implementing Regulations, 16 U.S.C. §§ 661-666c

Any federal agency that proposes to control or modify any body of water must first consult with the USFWS or NMFS, as appropriate, and with the head of the appropriate state agency exercising administration over the wildlife resources of the affected state. The U.S. Army Corps of Engineers (USACE) has a memorandum of understanding with the USFWS to provide a coordination act report to assist in planning efforts.

Migratory Bird Treaty Act (MBTA), 16 U.S.C. § 703 et. seq.

The MBTA is a federal statute that implements U.S. treaties with several countries concerning the conservation and protection of migratory birds. The number of bird species covered by the MBTA is extensive and is listed at 50 CFR 10.13. Further, the regulatory definition of a migratory bird is broad and includes any mutation or hybrid of a listed species, as well as any part, egg, or nest of such bird (50 CFR 10.12). Migratory birds are not necessarily federally listed endangered or threatened under the ESA. The MBTA, which is enforced by the USFWS, makes it unlawful "by any means or manner, to pursue, hunt, take, capture [or] kill" any migratory bird except as permitted by regulation. The applicable regulations prohibit the take, possession, import, export, transport, sale purchase, barter, or the offering of these activities, except as permitted by the implementing regulations.

Marine Mammal Protection Act (MMPA), 16 U.S.C. §§ 1361-1421h

The MMPA protects and conserves marine mammal species by placing a moratorium on harassing, hunting, capturing, or killing any marine mammal or attempting any of these. If a project proponent determines that an action could incidentally harass ("take") marine mammals, the proponent must consult with either the USFWS or NMFS to determine if a permit to take a marine mammal is required. A recent redefinition of "take" of an MMPA-protected species occurred under the FY 2004 Defense Authorization Act (House Bill 1588), where an animal is "taken" if it is harassed, and where harassment is defined as "(i) any act that injures or has the significant potential to injure a marine mammal or marine mammal stock in the wild or (ii) any act that disturbs or is likely to disturb a marine mammal or marine mammal stock in the wild by causing disruption of natural behavioral patterns, including, but not limited to, migration, surfacing, nursing, breeding, feeding, or sheltering, to a point where such behavioral patterns are abandoned or significantly altered" (section 315(f) P.L. 107–314; 16 U.S.C. § 703 note).

Rivers and Harbors Appropriations Act (RHA) of 1899, 33 U.S.C. §§ 401, 403

Section 10 of the RHA prohibits the unauthorized obstruction or alteration of any navigable water. Navigable waters under the RHA are those "subject to the ebb and flow of the tide and/or are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce" (33 CFR 3294). Typical activities requiring Section 10 permits from USACE are construction

of piers, wharves, bulkheads, marinas, ramps, floats, intake structures, cable or pipeline crossings, and dredging and excavation.

Coastal Zone Management Act (CZMA), 16 U.S.C. §§ 1451-1466

The CZMA encourages states to preserve, protect, develop, and, where possible, restore or enhance valuable natural coastal resources, such as wetlands, floodplains, estuaries, beaches, dunes, barrier islands, and coral reefs, as well as the fish and wildlife using those habitats. To encourage states to participate, the CZMA makes federal financial assistance available to any coastal state or territory that is willing to develop and implement a comprehensive coastal management program. Federal agencies are required to carry out activities that affect any land or water use or natural resource of a state's coastal zone in a manner consistent with the enforceable policies of an approved state management plan.

National Aquatic Nuisance Prevention and Control Act (NANCPA) of 1990

NANCPA 90 mandates ballast water management for vessels entering the Great Lakes. This law was reauthorized as the National Invasive Species Act of 1996 (NISA 96), which strengthened the 1990 law and required the development of voluntary ballast management guidelines for all other ships entering U.S. waters. The law also requires all vessels that enter U.S. territorial waters (with certain exemptions) to manage ballast water according to prescribed measures. NISA 96 also required the US Coast Guard (USCG) to evaluate the effectiveness of the voluntary ballast management program three years after implementation. In 2004, voluntary guidelines were determined to be ineffective, and thus USCG initiated mandatory ballast management for all ships entering U.S. waters from outside the Exclusive Economic Zone (EEZ) of the United States.

Current management strategies for preventing introductions via ballast water are limited to ballast water retention, open ocean exchange or alternate environmentally sound methods of ballast water management approved by USCG.

Title I of the Marine Protection, Research, and Sanctuaries Act, Ocean Dumping Act (MPRSA), 33 U.S.C., §§ 1401-1420

The USEPA has regulatory responsibilities with regard to ocean water quality under both the Clean Water Act and Title 1 of the MPRSA (Ocean Dumping Act). Title I of the MPRSA prohibits all ocean dumping, except that allowed by permits, in any ocean waters under U.S. jurisdiction, by any U.S. vessel, or by any vessel sailing from a U.S. port. Certain materials, such as high-level radioactive waste, chemical and biological warfare agents, medical waste, sewage sludge, and industrial waste, may not be dumped in the ocean. The law regulates ocean dumping within the area extending 12 nm seaward from the U.S. baseline and regulates transport of material by U.S.-flagged vessels for dumping into ocean waters (Copeland 2010). Additional information about the types of permitted discharges allowed under the Act is in the water quality regulatory overview in Section 4.2 (Physical Resources).

State Regulations

California Endangered Species Act (CESA), California Fish and Game Code §§ 2050-2111.5

The CESA places the responsibility for maintaining a list of threatened and endangered species with the California Department of Fish and Wildlife (CDFW). The CDFW also maintains a list of candidate spe-

cies that are under review for addition to either the list of endangered species or the list of threatened species. Pursuant to the requirements of CESA, an agency reviewing a proposed project within its jurisdiction must determine whether any California-listed endangered or threatened species may be present in the project area and determine whether the proposed project will have a potentially significant impact on such species. In addition, the CDFW encourages informal consultation on any proposed project that may affect a candidate species.

Fish and Wildlife Protection and Conservation, California Fish and Game Code §§ 1600-1616

The state's authority in regulating activities in wetlands resides primarily with the CDFW and the State Water Resources Control Board (SWRCB). The State of California regulates wetlands through the CDFW, which provides comment on USACE permit actions under the Fish and Wildlife Coordination Act. The CDFW may develop mitigation measures and require the preparation of a streambed alteration agreement if a proposed project would obstruct the flow or alter the bed, channel, or bank of a river or stream in which there are fish or wildlife resources, including intermittent and ephemeral streams. The CDFW is authorized to do so by the State Fish and Game Code Sections 1600-1616.

The California legislature gave the Fish and Wildlife Commission the authority to establish State Marine Reserves, State Marine Conservation Areas State Marine Parks, State Marine Recreational Management Areas, and Special Closures as a result of the California Marine Life Protection Act of 1999. The California Fish and Wildlife Commission also has the authority to prohibit or restrict activities that may harm resources, including fishing, collecting, swimming, boating, and public entry. The CDFW also conducts oil spill response, damage assessment, and restoration through its Office of Spill Prevention and Response.

California Code of Regulations, Title 14 Division 1

The Fish and Game Commission has broad authority under Title 14 to establish regulations that restrict both sport and commercial fishing and otherwise afford protection to marine organisms and habitats. Of particular relevance to this DEIS are the eleven existing MPAs in the study area (Title 14, Section 632). MPAs in the study area have been in effect since May 1, 2010.

There are a total of four State Marine Reserves in the study area: Point Arena, Del Mar Landing, Stewarts Point, Gerstle Cove and Bodega Head. In a state marine reserve, it is unlawful to injure, damage, take, or possess any living, geological, or cultural marine resource, except under a scientific collecting permit or specific authorization from the California Fish and Wildlife Commission for research, restoration, or monitoring purposes.

There are a total of six State Marine Conservation Areas in the study area: Point Arena, Sea Lion Cove, Saunders Reef, Stewarts Point, Salt Point , and Russian River. In a state marine conservation area, it is unlawful to injure, damage, take, or possess any living, geological, or cultural marine resource for commercial or recreational purposes, or a combination of commercial and recreational purposes except as specified. The California Fish and Wildlife Commission may issue scientific collecting permits or specifically authorize research, education, and recreational activities, and certain commercial and recreational harvest of marine resources, provided that these uses do not compromise protection of the species of interest, natural community, habitat, or geological features.

There is one State Marine Recreational Management Area in the study area: the Russian River State Marine Recreational Management Area. In a state marine recreational management area, it is unlawful to perform any activity that would compromise the recreational values for which the area may be designated. Recreational opportunities may be protected, enhanced, or restricted, while preserving basic resource values of the area. No other use is restricted unless specified.

California Coastal Act (CCA), California Public Resources Code § 30000 et seq.

The CCA defines the "coastal zone" as the area of the state that extends 3 miles seaward and generally about 1,000 yards (910 meters) inland. Almost all development within the coastal zone, which contains many wetlands, requires a coastal development permit from either the California Coastal Commission or a local government with a certified Local Coastal Program. Additional details are provided in the regulatory overview of Section 4.6 (Socioeconomic Resources, Human Uses, and Environmental Justice).

State Water Resources Control Board (SWRCB)

The SWRCB adopts statewide water quality control plans and policies, such as the Ocean Plan, the Thermal Plan, and the State Implementation Policy. The SWRCB has established a system of 34 Areas of Special Biological Significance (ASBS). These areas are designated for special protection from undesirable alteration in natural water quality. Four ASBSs are located in the study area, including Saunders Reef, Del Mar Landing, Gerstle Cove, and Bodega. Additional information about ASBS designations and the regulatory environment of the State Water Resources Control Board is in Section 4.2.2 (Physical Resources – Regulatory Environment).

California Marine Invasive Species Act, Cal. Pub.Res. Code § 71200 et seq.

See Section 4.2.2 (Physical Resources Regulatory Environment) for more information about the California invasive species regulatory environment.

California Code of Regulations, Title 2, Division 3, Chapter 1, Article 4.6

Article 4.6 was designed to move the state toward elimination of the discharge of nonindigenous species into the waters of the state or into waters that may impact the waters of the state, based on the best available technology economically achievable. The provisions of Article 4.6 apply to all vessels arriving at a California port or place from another port or place within the Pacific Coast Region. All such vessels shall(1) exchange ballast water in near-coastal waters (more than 50 nm from land and in water at least 200 meters [656 feet, 109 fathoms] deep) before entering the waters of the State if that ballast water was taken on in a port or place within the Pacific Coast Region, (2) retain all ballast water on board, (3) discharge the ballast water to a reception facility approved by the California State Lands Commission (CSLC) or(4) use an alternative, environmentally sound method of ballast water management that has been approved by the CSLC or the USCG.

4.3.3 Impact Assessment Methodology

Criteria to determine the significance of impacts on biological resources are based on federal, state, and local standards and regulations. Impacts on biological resources were evaluated by determining the sensitivity, significance, or rarity of each resource that would be affected by the proposed or alternative regulations and by using thresholds of significance to determine if the impact constitutes a significant impact.

The significance threshold may be different for each habitat or species. Impacts may be either direct or indirect.

Direct impacts on biological resources result when biological resources or critical habitats are altered, destroyed, or removed during the course of project implementation. Indirect impacts on biological resources may occur when project-related activities result in environmental changes that indirectly influence the survival, distribution, or abundance of native species (or increase the abundance of an introduced species). Examples of indirect impacts include effects of noise, presence of chemical contamination, or incidence of human activity that may disturb or harm wildlife. It is also possible to have beneficial impacts, directly or indirectly. Finally, impacts may be short term or long term. Short-term impacts are generally not considered significant, by definition.

For this analysis, assessing specific potential impacts on biological resources is based on looking at the physical implications of each proposed and alternative regulation considered in relation to the known presence and extent of biological resources in the relevant areas. Parameters for assessment include the following:

- Relative importance or value of the resource affected (e.g., its legal, commercial, recreational, ecological, or scientific value);
- The resource's relevant occurrence in the region;
- Sensitivity of the resource to the proposed action;
- Anticipated physical extent of the potential impact; and
- Anticipated duration of the ecological ramifications of the potential impact.

Where relevant, the importance or value of each biological resource is evaluated based on the following criteria (listed in order of importance):

- Designation of the resource by federal or state resource agencies (e.g., USACE and the USFWS) as a high value or sensitive resource;
- Known or presumed regional sensitivity of the resource; and
- Known or presumed local significance of the resource.

In sum, for this analysis a project alternative was considered to have a significant impact on the biological environment under any of the following circumstances:

- a population of a threatened, endangered, regulated, or other sensitive species was adversely affected by reduction in numbers, by alteration in behavior, reproduction, or survival, or by loss or disturbance of habitat. Any "take" (see Section 3.3.10 under Wildlife Disturbance for definition) of a listed or sensitive species is considered significant under the ESA or the MMPA;
- it conflicted with Coastal Zone Management Program policies;

- it had an adverse effect on a species, natural community, or habitat that is specifically recognized as biologically significant in local, state, or federal policies, statutes, or regulations;
- it had a substantial adverse effect on a species, natural community, or habitat that is recognized for scientific, recreational, ecological, or commercial importance;
- any fishes or wildlife migration routes were impeded for a period that would significantly disrupt that migration;
- it would alter or destroy habitat in such a way that would prevent biological communities that inhabited the area prior to the project from reestablishing themselves;
- it would extensively alter or cause the loss of biological communities in high-quality habitat for longer than one year; or
- it allows biological resources to be exploited in ways inconsistent with the plans and policies of the ONMS or would otherwise violate the ONMS or NOAA program regulations.

The overall methodology, including data sources and assumptions, used to conduct the biological resources impact evaluation is consistent with the NOAA NEPA guidelines (NAO 216-6).

4.3.4 Environmental Consequences

Beneficial impacts resulting from proposed regulations that have the potential to improve water quality (and thus improve or protect habitats) are described in Section 4.2 (Physical Resources). See Section 4.2.4 for additional details.

Proposed Action

The proposed action is intended to provide additional protection to marine biological resources by expanding the sanctuary boundaries and applying sanctuary regulations and management plan actions to a larger area. As such, inclusion of this area within the sanctuary system would provide additional and complementary regulatory protection, human and financial resources for management, and would improve public awareness of the area's natural resource value and develop cooperative ways to maintain the area's ecosystem health. The larger presence the sanctuary would have in California's north coast, in conjunction with education and outreach strategies and activities outlined in the various management plan action plans, would foster increased awareness, collaboration and public regard for the marine resources both within and outside proposed sanctuary boundaries. This action is expected to have a beneficial impact on the biological resources within the expansion area.

Numerous regulations that are part of the proposed action would offer direct and/or indirect benefit to these valuable resources in the sanctuary expansion area by prohibiting activities that could be harmful, including taking or possessing wildlife, seabed disturbance, oil and gas development, vessel discharges, leaving a vessel adrift and release of introduced species. Also, limiting MPWC use and establishing Special Wildlife Protection Zones (SWPZs) for purposes of prohibiting overflight disturbance of wildlife and ensuring cargo vessels do not come near these areas all would contribute to beneficial impacts on biological resources.

Wildlife Protection and Introduced Species

Proposed regulations prohibit taking or possessing marine mammals, sea turtles and birds, consistent with other existing federal regulations (e.g., ESA, MMPA). The proposed sanctuary regulations may offer a slightly broader level of protection, especially for bird species, in the proposed expansion area.

The proposed prohibition of introduced species, with exceptions, would help minimize the risk of invasive introduced species that are detrimental to native biological species and ecosystems. Details on the types of impacts that introduced species may have on biological resources are provided in Section 4.2.1 (Affected Environment).

Discharges

Section 4.2 (Physical Resources) describes the proposed action's beneficial effects on marine water quality due to proposed regulations that would prohibit discharging within the sanctuary, with certain exceptions (e.g., clean graywater), and would also prohibit discharging or depositing any material or other matter from beyond the boundary of the sanctuary that subsequently enters the sanctuary and injures a sanctuary resource or quality. These regulations would have a beneficial impact on biological resources, by minimizing or reducing the likelihood of potentially harmful or toxic spills or discharges that could kill, injure or impair birds, marine mammals, fish and other resources. Indirect benefits would be expected from overall reduction of vessel discharges in the proposed expansion area.

Oil and Gas Development Prohibition

The proposed regulations would prohibit all oil and gas development within the existing and proposed sanctuary expansion area. There are no existing or planned oil and gas production facilities in the vicinity, but this prohibition would eliminate the potential for facilities to be installed within the expansion area and reduce the risk of oil or gas spills or other hazardous materials being deposited into sanctuary waters. This would result in a beneficial impact on biological resources in the expansion area.

MPWC Zones

Wildlife impacts from MPWC disturbance can include interruption of normal activity and alarm or flight; avoidance and displacement, loss of habitat use, decreased reproductive success, interference with movement, direct mortality, interference with courtship, alteration of behavior, change in community structure and nest abandonment (U.S. Dept. of Interior, 1998). As noted in Section 3.2 (Proposed Action Description), MPWC operators commonly accelerate and decelerate repeatedly and unpredictably, travel at rapid speeds and can maneuver close to rocks while motorboat operators generally transit through areas at steady speeds and bearings and slow down as they approach shore and offshore rocks. Thus, wildlife disturbance impacts from MPWC tend to be more severe than those from motorboat use, due to impacts in ecologically sensitive areas, often in nearshore locations. Establishing MPWC zones away from sensitive areas would provide a direct beneficial impact on biological resources.

Cargo Vessel and Overflight Regulations

Establishing two SWPZs (see Figure 3.2 8 and 3.2-9) near Gualala and Fort Ross in the GFNMS expansion area would provide added protection from potential future oil spills and disturbance to sensitive seabird and pinniped colonies. Cargo vessels would be prohibited from transiting closer than one nm of a SWPZ

to prevent wildlife disturbance and minimize the risk of oil spills in these areas, and aircraft would be prohibited from flying below 1,000 feet above ground level over a SWPZ. These two measures would result in direct beneficial impacts on biological resources. Within the existing GFNMS boundaries, the existing zones designated for cargo vessel buffers and overflight restrictions would be converted to SWPZs. The overall size and location would generally be the same as the existing protected areas. Since the SWPZ boundaries generally overlap the protected areas in the existing GFNMS, this change would not affect biological resources; sensitive areas within the existing sanctuary boundaries would continue to be protected.

Authorizations

For the existing sanctuaries, a proposed change in existing regulations would have the potential to result in minor adverse impacts, related to the new provision to allow authorizations for previously prohibited activities such as discharge, construction, drilling, dredging or other disturbance on submerged land, and several other activities. As described in Section 3.2 (Proposed Action Description), the authorization process would establish a mechanism for both sanctuaries to potentially allow new activities such as alternative energy projects, sewage outfalls, road construction, dredging to establish and maintain marinas, establishing new dredge disposal sites, coastal armoring, or construction of groins, jetties, piers and marinas. Most of these shoreline uses would only apply to the GFNMS. However, authorization of any such uses would be subject to the limitations established in proposed regulations, which provide a means for the sanctuary to require conditions on such activities to protect sanctuary resources. Therefore, this change would have the potential to result in limited adverse impacts, but only if a future activity is actually approved and constructed. Given the ability to condition a future project, the potential impact on biological resources in the existing CBNMS and GFNMS is considered less than significant. Moreover, any authorization considered would be subject to requirements under NEPA and would undergo the necessary environmental analysis and public review at that time.

The deletion of the exemption and authorization process for oil and gas-related pipelines in GFNMS would have no real impact on marine resources for two reasons. First, no oil or gas development projects are planned or reasonably foreseeable in the area, reducing the potential for pipelines to cross the sanctuary. Secondly, any authorization issued for pipelines would be subject to the terms and conditions that may be applied to protect sanctuary resources.

No Action Alternative

The No Action alternative would result in no new impacts on biological resources. The beneficial effects on biological resources from additional resource protection, as described for the proposed action, would not be achieved. Under the No Action alternative, the proposed expansion area would be without the sanctuary regulations that address threats from discharges, introduced species, seabed disturbance and potential future oil and gas development. However, existing agencies would continue to regulate certain aspects of water quality and biological resources.

Existing Regulations Alternative

Applying the existing CBNMS and GFNMS regulations to the entire expansion area would have beneficial effects similar to those described for the proposed action. This alternative would include the same prohibition on taking or possessing marine mammals, sea turtles and birds, as well as prohibiting seabed

disturbance, oil and gas development, vessel discharges, leaving a vessel adrift and release of introduced species. In addition, this alternative would prohibit MPWC use throughout the expansion area, which would provide an incremental increase in biological resources protection, compared to the proposed action. Furthermore, without an authorization process in CBNMS and GFNMS, there would be less potential for adverse impacts on biological resources. As described for the proposed action, the authorization provision potentially allows the sanctuaries to sanction otherwise prohibited activities, in limited circumstances.

Another difference between this alternative and the proposed action is that instead of establishing the two SWPZs in the expansion area and restricting cargo vessels and low flights near these zones, the four existing ASBS in the expansion area would serve the same purpose, as shown in Figure 3.4-1. In the existing GFNMS, cargo vessels and flights would be restricted, as they are currently are, near the Farallon Islands and the several existing ASBS. There would be no establishment of SWPZs in the existing GFNMS or the expansion area. Although applying existing regulations to the ASBS in the expansion area would provide beneficial impacts, the benefits would likely not be as substantial as the proposed action because the ASBS do not overlap sensitive seabird and pinniped areas and therefore would not fully protect sensitive wildlife from cargo vessels or low flying aircraft.

There would be no adverse or beneficial impact on biological resources in the existing sanctuaries, as the existing regulations would continue to be implemented.

Arena Cove Boundary Alternative

In addition to the beneficial effects described for the proposed action, to the extent that biological resources exist within the inner Arena cove, they would be afforded additional protection as described in the impacts of the proposed action by including this larger area within the sanctuary. This would result in a minor increase in beneficial biological resource impacts, relative to the proposed action or existing regulations alternative.

MPWC Zones Alternatives

There are three alternatives for two of the proposed action MPWC zones. The alternative MPWC zones differ slightly in size and shape from the zones described for the proposed action. Alternative Zone 2A would be only 0.2 sq nm larger than the proposed action Zone 2. Alternative Zone 2A would create an offshore buffer of 1000 feet to project the nearshore environment and would allow access closer to coves between Moat and Saunders Landing and between Iversen Landing and Haven's neck. Alternative Zone 2B would be 1.9 sq nm larger than Zone 2 in the proposed action. There are some areas in Zone 2B where wildlife can rest or roost on rocks when the weather or tides allow, which could potentially cause a disturbance. Due to the rocky coastline, steep cliffs and powerful wave conditions, MPWC users will likely stay away from the nearshore, except when accessing the area from Arena Cove. This option also allows MPWC users to land at the two small beaches in this zone, in areas where there is not known breeding seabird colonies or pinniped pupping sites. Alternative Zone 4A is smaller than the proposed action zone and restricts shoreline access points, which would further limit potential impacts on wildlife and have a slightly higher level of beneficial impact on biological resources. Overall, the differences between the proposed action and alternatives for the MPWC zones are minor and beneficial impacts would be similar.

4.4 Commercial Fishing and Aquaculture

This section addresses commercial fishing resources and effects on the commercial fishing industry and aquaculture. The study area for commercial fisheries consists of the proposed expansion area of CBNMS and GFNMS and nearby waters, in which there are commercial fish resources and commercial fishing vessels operating, as well as the ports where those vessels land the majority of their fish. The study area for aquaculture is the proposed expansion area of CBNMS and GFNMS.

Primary information sources include the JMPR FEIS (NOAA 2008), Marine Life Protection Act (MLPA) documents, Ecotrust documents and various CDFW databases that the reports draw on — notably the commercial fisheries landings data.

4.4.1 Regional Overview of Affected Environment

This section presents information for the study area, which was derived from the reported landings that occurred in the ports adjacent to the study area. The reported landings are an accurate descriptor of the pounds landed and ex-vessel revenues (the payment received at the point of landing for the catch) generated in the ports adjacent to the study area. These ports have been classified into four port complexes: Fort Bragg, Bodega Bay, San Francisco, and Princeton/Half Moon Bay area ports (Table 4.4-1). The port of Princeton/Half Moon Bay is normally included in the San Francisco Bay port complex, but for purposes of providing more area-specific information in this analysis, it is reported separately.

Table 4.4-1. Listing of Individual Ports by Port Group

Fort Bragg Area (51%)	Bodega Bay Area (29%)	San Francisco Bay Area (6%)	Princeton/Half Moon Bay (12%)
Albion	**Bodega Bay**	Alameda	**Princeton/Half Moon Bay**
Anchor Bay	Bolinas	Alviso	
Elk	Jenner	Berkeley	
Fort Bragg	Marshall	China Camp	
Gualala	Point Reyes	Emeryville	
Point Arena	Tomales Bay	Oakland	
Westport		Richmond	
		San Francisco	
		Sausalito	

Source: California Fishery Information System (CFIS) database (CDFW 2013). Values were adjusted for inflation (2011 dollars).
Note: The number within the parentheses next to the port group indicates the average percent of ex-vessel revenue per port group (2000-2011). For each port group, the top port in terms of ex-vessel revenue is bolded.

Fishing Vessels

Data from 2000 to 2011 show that about 200 commercial fishing vessels make landings in the ports adjacent to the study area on an average annual basis (Figure 4.4-1). These are unique vessels, spanning all gear types. Table 4.4-2 shows the number of commercial fishing vessels that reported catches in each of the major port groups that are adjacent to the study area. Numerous vessels land a small proportion of the study area's landings and ex-vessel value (~ 2%) at ports to the north (e.g. Eureka) or to the south (e.g., Moss Landing or even as far south as San Diego). These vessels have been grouped into a port category named "Other Area" and are not further discussed in this analysis.

Table 4.4-2. Number of Commercial Fishing Vessels Reporting Catches at Major Port Groups

Year	Fort Bragg Area	Bodega Bay Area	San Francisco Area	Half Moon Bay Area	Other Areas	Totals
2000	72	115	22	16	19	204
2001	30	91	15	11	68	189
2002	129	103	28	11	11	227
2003	173	87	44	17	24	280
2004	147	79	47	25	11	260
2005	149	56	22	20	5	207
2006	83	131	28	39	14	235
2007	123	187	28	13	20	298
2008	32	37	11	5	3	77
2009	32	26	18	13	1	78
2010	33	60	12	5	4	103
2011	120	113	25	37	9	245

Source: CFIS database (CDFW 2013).

Due to intensive fishing of deep-water species (particularly groundfish) along the west coast, many fish populations declined in the years between 1980 and 2000. In response, regulations imposed by fisheries managers became more restrictive and the number of fishing vessels declined significantly between 1981 and 2003. For example, ports adjacent to the national marine sanctuaries on the central California coast (Monterey Bay, Gulf of the Farallones and Cordell Bank) experienced a drastic decline in the number of commercial vessels from 1980 to 2000 (NOAA 2008). In these sanctuaries, the number of vessels declined from approximately 3,200 vessels in the early 1980s to approximately 1,000 vessels in early 2000. Figure 4.4-1 illustrates a different decline that occurred in the study area in 2008–2010, when State and Federal fisheries managers imposed emergency closures in 2008 through 2010 on salmon fishing zones in California and Oregon to protect Sacramento River Chinook Salmon, then in a state of unprecedented collapse. Since the salmon season reopened in 2011 and 2012, the number of vessels has increased slightly above the average of 200 vessels for the area.

Ports

Fishing vessels catching fish in the study area come from all over California, with those port complexes nearest to the proposed expansion area, Fort Bragg area and Bodega Bay area, accounting for 80% of the catch (Table 4.4-1). The port complexes of Fort Bragg, Bodega Bay, San Francisco, and Princeton/Half Moon Bay account for more than 98% of the ex-vessel value captured from the study area. An extremely small percentage of the total catch from the proposed expansion area (~2%) is landed in ports further to the north and south, such as Crescent City, Moss Landing, Santa Cruz and Morro Bay.

Federal socioeconomic analyses conducted in 2006 by the Pacific Fishery Management Council (PFMC) and the National Marine Fisheries Service (NMFS) to consider the needs of fishing communities reported the following findings for several ports of the study area. The County of Mendocino, in which Fort Bragg is located, was classified as “most vulnerable” with high levels of dependence on commercial fishing and low levels of resilience. The town of Point Arena, also located within Mendocino County, was also

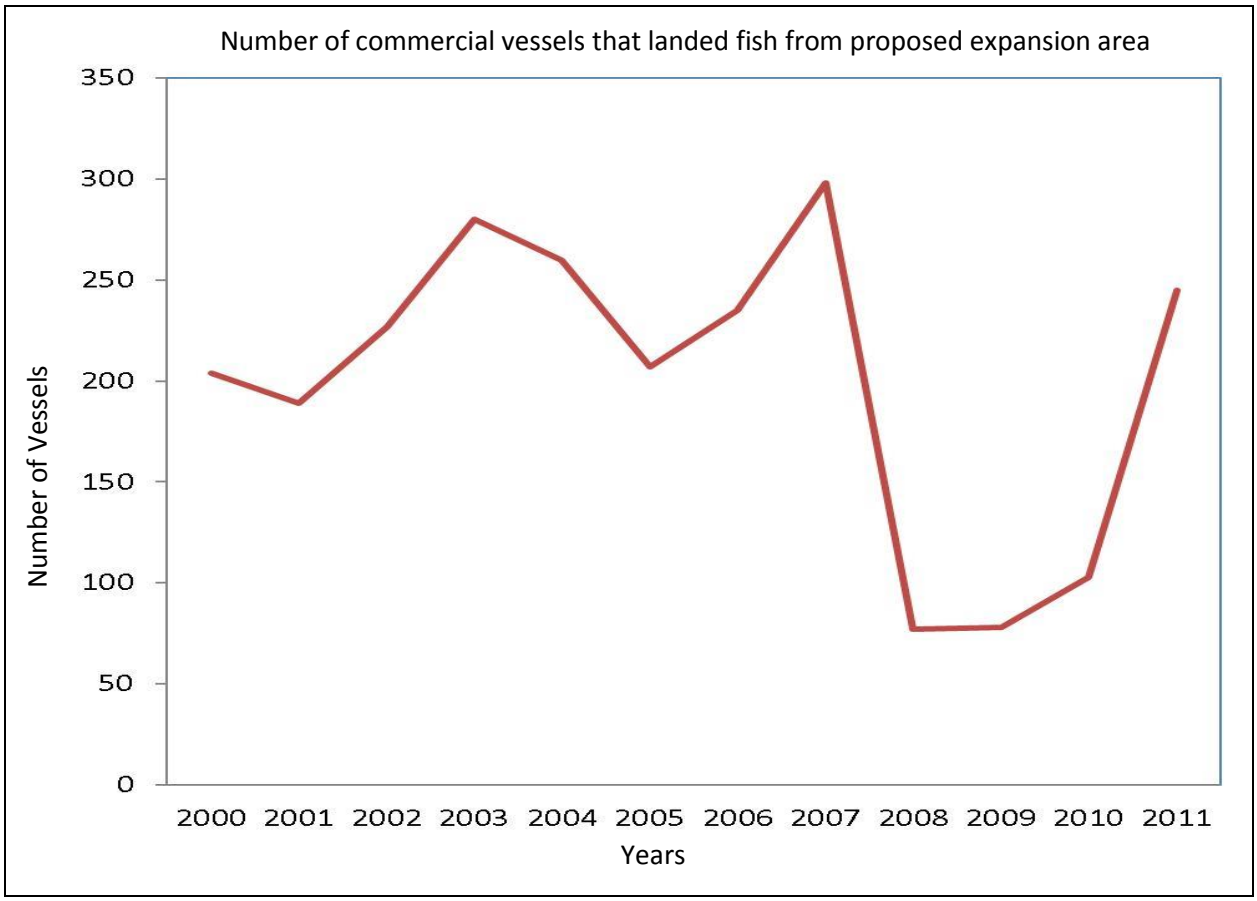

Figure 4.4-1. Number of Commercial Fishing Vessels Reporting Catches from the Proposed Expansion Area
Source: CFIS database (CDFW 2013).

classified as "vulnerable," as was the village of Bodega Bay, located in Sonoma County. In the study, "vulnerable" also meant high levels of dependence on commercial fishing and low levels of resilience. The city of Oakland, within the San Francisco port complex, was classified as "vulnerable" with high levels of dependence on commercial fishing and low levels of resilience (PFMC and NMFS 2006).

Fishing Gear Types

CDFW identifies a variety of mobile and fixed gear types deployed by commercial fishermen off the California coast. However, only the following gear types (and the species they target) are commonly used in the study area (CDFG 2007):

- Trolling gear for salmon, groundfish or tuna,
- Pots/traps, predominantly for crab, but also for nearshore finfish and rockfish fishery,
- Set longlines for groundfish,
- Hook and line for nearshore finfish and rockfish fishery,
- Hookah gear (compressed air system) for divers harvesting red sea urchins,
- Trawl gear for groundfish (rockfish and flatfish),
- Round haul gear (e.g., purse seine, drum seine, lampara nets) for coastal pelagic species,
- Brail gear (i.e. scoop nets) for coastal pelagic species and
- Set gill nets for the Pacific Herring fishery.

Trolling gear, pots/traps, long lines, hook and line, and urchin harvest using hookah gear are deployed within State waters. Round haul and brail gear are deployed in state and federal waters for coastal pelagic species including Pacific Sardine, Northern Anchovy, and Market Squid. Trawl gear, demersal seine nets and gill nets are prohibited in State waters (within 3 nm) in the study area, but are used in federal waters (outside 3 nm) to target coastal pelagic species, California Halibut, and groundfish species (diverse rockfish species and a suite of flatfishes). The take of Pacific Herring for their roe is exempted from the gill net prohibition, and only gill nets may be used within State waters for the roe herring fishery.

Catch from bottom trawl gear began declining in the mid-1980s from 20 million pounds of groundfish landed to less than 10 percent of that nearly two decades later in early 2000. As the use of trawl gear declined the use of other gear types increased — notably hook and line gear (NOAA 2008).

Species Harvested

Commercial catch is reported either by species or, in certain cases, "market categories." Market categories include a variety of similar species, or species commonly sold as a generic category of fish. In the California Commercial Landings for 2005-2006, 105 categories of fishes and 14 categories of invertebrates were landed in the Bodega Bay and San Francisco port complexes, and the Point Arena and Anchor Bay ports (not including estuarine categories that only occur outside the study region) (CDFG 2007). The categories constructed for the study area are based upon the species groups used in the profile reports for the MLPA study regions North-Central Coast and North Coast. A species is sometimes further categorized according to the gear type, because gear types affect the condition of the fish and therefore the market value. For years 2000 to 2011,the categories in order of pounds landed (largest to smallest) are red urchin; Dungeness crab; Dover Sole, Thornyheads and Sablefish caught with trawl; salmon (Chinook and Coho); market squid; coastal pelagics (Pacific Sardine, Northern Anchovy, Jack Mackerel, and Pacific Mackerel); shelf and slope rockfish, which are the rockfish taken in deeper waters of the continental shelf and slope (Aurora, Bank, Blackgill, Bocaccio, Bronzespotted, Canary, Chilipepper, Cowcod, Darkblotched, Flag, Greenblotched, Greenspotted, Greenstriped, Mexican, Pacific Ocean Perch [UC], Pink, Pinkrose, Redbanded, Redstriped, Rougheye, Sharpchin, Shortraker, Splitnose, Stripetail, Tiger, Vermilion, Widow, Yelloweye, Yellowmouth, and Yellowtail); flatfish other than Sanddab or Dover Sole (e.g. Starry Flounder), Sablefish non-trawl; tuna; shallow nearshore complex of Cabezon, Monkeyface Prickleback, Scorpion Fish and rockfishes (Black and Yellow, China, Gopher, Grass and Kelp); sharks and rays, except White Shark and Big Skate; Lingcod; California Halibut; spot prawn; deeper nearshore rockfish (Black, Brown, Olive, Copper, Treefish, Blue, Quillback); Hagfish; Herring; Surfperch; Swordfish; Dover Sole non-trawl; and smelt.

Catch Values and Quantities

Figure 4.4-2 presents total catch amount and ex-vessel values for the ports adjacent to the study area for 2000–2011. Total landings and ex-vessel revenue have steadily improved in the 11-year period, from a low in 2000 of 0.6 million pounds and $1.1 million to more than six-fold increase in 2011 of 3.8 million pounds landed and ex-vessel revenues of $6.67 million. The total catch experienced a decline in the period 2004 through 2006, when it dipped to 0.95 million pounds and ex-vessel revenues to $1.79 million. Since that time period, landings and ex-vessel revenues have rebounded to the high of 2011. The contrast between ex-vessel revenue and total catch in 2008–2010 indicates a probable shift to relatively higher

volume, but lower value fisheries, or a decrease in the average value (per pound) of fish caught in the study region.

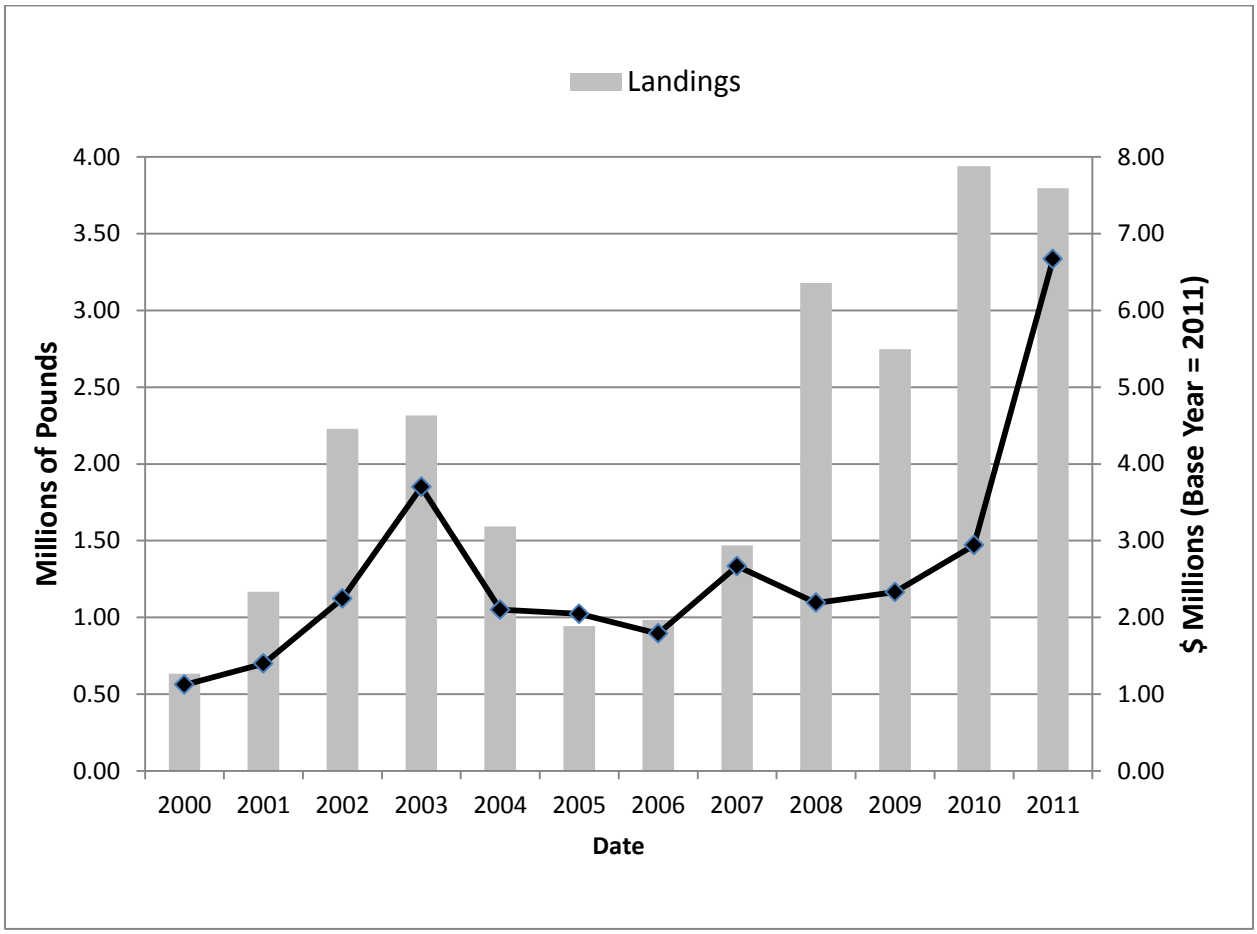

Figure 4.4-2. Total Landings and Ex-vessel Revenue Reported to the Ports of the Study Area, 2000-2011
Source: CFIS database (CDFW 2013). Values were adjusted for inflation (2011 dollars).

Table 4.4-3 summarizes CDFW data for all landings and value by select species groups for the study area. The table is sorted according to three years spanning the 2000–2011 time period and captures a select group of fisheries within the top twelve species or species groups for 2000, 2005 and 2011. Dungeness crab, salmon and red urchin consistently score in the top high value fisheries from 2000 to 2011. Even in the period of decline, represented by 2005, when several top species are not even represented in the total catch, Dungeness crab, salmon and red urchin continued to be within the top three landings and ex-vessel revenues. Although the red urchin fishery continues to be well represented in the total landings of the study area, its value has been in decline, particularly in the period from 2000 through 2007 (Ecotrust 2008). The salmon fishery has experienced an increase in value as stock productivity and management regime have dictated a decrease in landings. In any year the value of a fishery is related to the stock, price, and fishery management.

Table 4.4-3. Selected Top Ex-vessel Revenue Producing Species/Species Groups Reported to the Ports of the Study Area, Pounds and Ex-vessel Value, 2000, 2005, 2011

	2000		*2005*		*2011*	
Species Group	***Pounds***	***Value***	***Pounds***	***Value***	***Pounds***	***Value***
Salmon	132,833	$439,260	358,357	$1,418,374	136,129	$ 701,623
Dungeness crab	44,851	153,247	120,386	237,271	1,715,432	4,174,976
Red urchin	109,718	101,442	428,462	228,413	501,630	355,975
DTS trawl*	67,275	31,897	—	—	530,597	494,721
Sablefish non-trawl	968	1,571	819	1,465	98,582	444,882
Shelf Rockfish	146,130	141,868	8,969	55,026	78,217	92,540
Market squid	78,788	7,718	—	—	555,111	139,098
Spot prawn	4,451	50,949	—	—	693	7,891
Tuna	5,894	8,009	3,799	6,108	44,416	65,651

Source: CFIS database (CDFW 2013). Values were adjusted for inflation (2011 dollars).
*DTS trawl: Dover sole, Thornyheads, and Sablefish complex harvested with trawl gear. Blanks in the table are true zeroes.

Groundfish and herring historically dominated landings from Bodega Bay to Half Moon Bay in the 1980s to the mid-1990s (NOAA 2008). A herring fishery is not expected to be pursued in the study area given the lack of suitable habitat. However, there is ample suitable habitat for a groundfish fishery. Yet, the representation of groundfish landings is much diminished in 2000–2011. Figure 4.4-3 demonstrates the diminished presence of groundfish landings from the study region. Only in recent years has the Dover Sole, Thornyheads, and Sablefish (DTS) complex captured with trawl gear (a complex comprised of groundfish species) been represented in the top five fisheries landed. Figure 4.4-3 clearly illustrates the prevalence of red urchin fishery, even with diminished value, throughout 2000–2011, followed by a steady presence of Dungeness crab landed. The salmon fishery is stronger in the first part of the period, showing a small resurgence in landings in 2011. These variations in landings are a result of market fluctuations, environmental factors and regulatory conditions.

Environmental Factors

Commercial fisheries in the study area are influenced by the oceanography of the California Current and the coastal topography of the area (capes, canyons and offshore banks). The California Current is an eastern boundary current that produces some of the most intensive wind-driven upwelling in the world. Upwelling at capes, such as Point Arena, produce jets that are diverted offshore, which in turn frequently create eddies, fronts and other mesoscale changes in the physical and biological conditions and productivity over multiple time scales (Parrish et al. 1981, Mann and Lazier 1996, Hickey, 1998). Food webs in these types of upwelling ecosystems tend to be structured around coastal pelagic species (e.g. Pacific Sardine and Northern Anchovy) that exhibit boom-bust cycles over decadal time scales (Bakun 1996, Checkley and Barth 2009, Fréon et al. 2009).

Much of the interannual variability in productivity of this ecosystem is influenced by shifting water masses of the California Current, with the El Niño/Southern Oscillation (ENSO) and Pacific (inter) Decadal Oscillation (PDO) introducing important changes in ocean conditions and productivity at slower rates; see Section 4.2 (Physical Resources) and Section 4.3 (Biological Resources) for additional information.

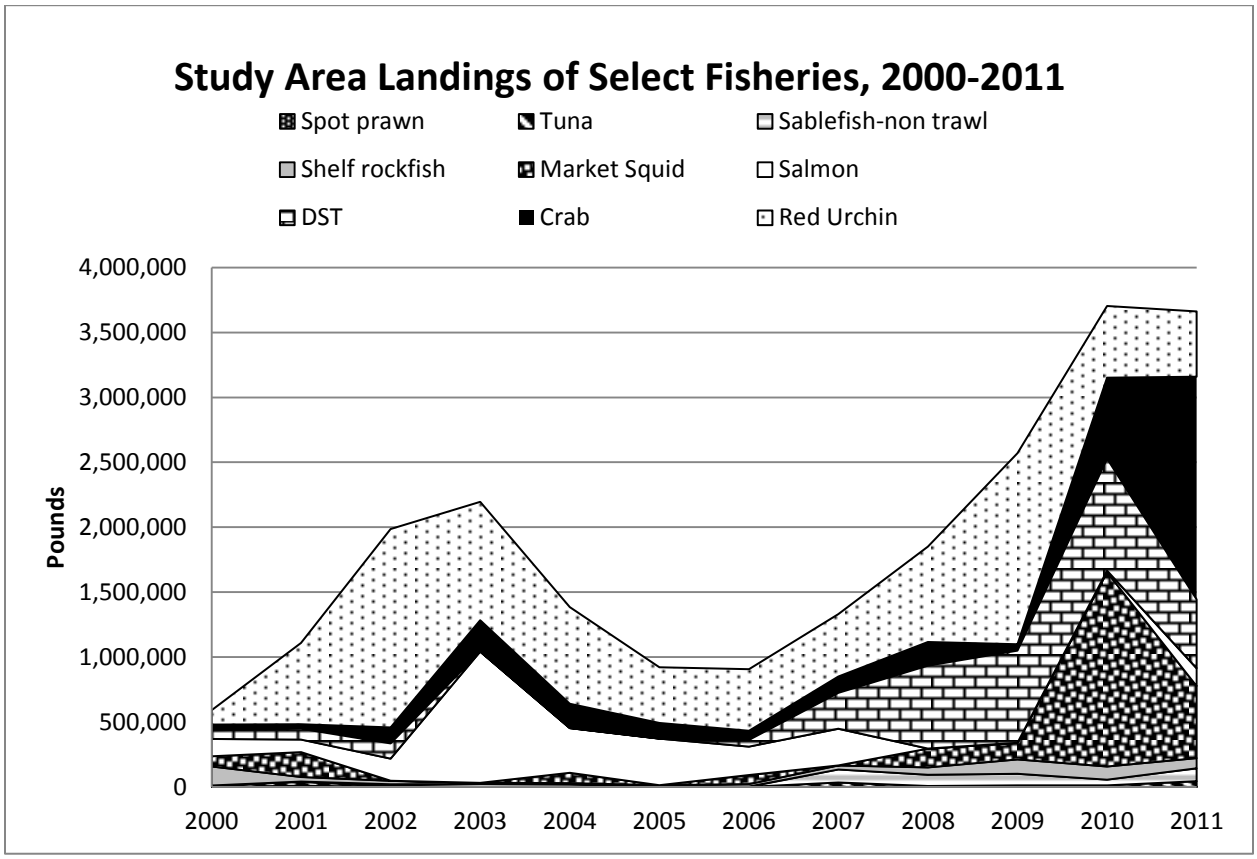

Figure 4.4-3. Landings of Select Fisheries from the Study Area, 2000-2011
Source: CFIS database (CDFW 2013). Values were adjusted for inflation (2011 dollars).

Aquaculture/Mariculture

NOAA developed a Marine Aquaculture Policy in June 2011 and defines aquaculture as "the propagation and rearing of aquatic organisms for any commercial, recreational, or public purpose." This definition covers all production of finfish, shellfish, plants, algae, and other marine organisms for (1) food and other commercial products; (2) wild stock replenishment for commercial and recreational fisheries; (3) rebuilding populations of threatened or endangered species under species recovery and conservation plans; and (4) restoration and conservation of marine and Great Lakes habitat (NOAA 2011). As described in the policy, besides engaging in regulatory actions in the Exclusive Economic Zone under the authority of the Magnuson-Stevens Fishery Conservation and Management Act (commonly referred to as the Magnuson-Stevens Act [MSA]), through Fishery Management Plans for species in need of conservation and management, NOAA may also engage in regulatory action under NMSA authority with respect to aquaculture activities within or potentially affecting national marine sanctuaries. NOAA has a direct regulatory role for aquaculture within the sanctuaries, in both State and federal waters, except in State waters when limited by formal written agreement with the Governor of that state. The proposed expansion area would be subject to any aquaculture-related regulations promulgated by NOAA, if incorporated into the sanctuary boundaries.

Commercial aquaculture has existed in the State of California since 1850 (NOAA 2008). No commercial aquaculture operations are currently conducted in the study area. Most marine aquaculture is currently

conducted in sheltered bays to the north and south of the study area such as Arcata Bay, Drakes Estero, Tomales Bay, Morro Bay and Agua Hedionda (Conte and Moore 2001), or in harbors, also sheltered, such as Monterey harbor. Various species are cultivated, including Pacific oyster (*Crassostrea gigas*), Kumamoto oyster (*C. sikamea*), Sumino oyster (*C. rivularis*), Eastern oyster (*C. virginica*), European flat oyster (*Ostrea edulis*), native oyster (*O. conchaphila*), Manila clam (*Tapes japonica*), Pacific littleneck clam (*Protothaca staminea*), rock scallop (*Hinnites giganteus*), California sea mussel (*Mytilus californianus*), bay mussel (*M. edulis*), and red abalone (*Haliotis rufescens*). Aquaculture of salmonids, exotic finfish and transgenic species (genetically modified species) is currently prohibited by the State of California.

4.4.2 Regulatory Overview

Commercial fisheries in the study area are regulated by the PFMC, NMFS, the California State Legislature and the California Fish and Game Commission. Coastal fisheries in State waters (up to 3 nm from the shoreline) are generally managed by the CDFW. NMFS and PFMC regulate and manage ocean fisheries beyond State waters (from 3 nm offshore to the extent of the EEZ, 200 nm offshore). In federal waters NOAA, U.S. Army Corps of Engineers, EPA, DOI, USDA and the U.S. Department of Health and Human Services all have various jurisdictional oversight over aquaculture facilities and operations. Jurisdiction over aquaculture in State waters is addressed below. There is also pending legislation relating to aquaculture in offshore waters.

See Section 4.2 (Physical Resources) for a summary of water quality and vessel discharge requirements.

Federal Regulations

Magnuson-Stevens Fishery Conservation and Management Act (MSA), 16 U.S.C. §§ 1801-1882

General Provisions

The MSA, is the primary federal law governing marine fisheries management in the United States. The MSA was enacted in 1976 and has been amended many times over the years with a notable revision in 1996 including provisions to minimize bycatch (the incidental harvest of non-target species), promote protection of essential fish habitat, and catch and release in recreational fishing. The 1996 MSA revision is often referred to as the Sustainable Fisheries Act or SFA. Revisions in 2006 required an end to overfishing and to prevent overfishing through annual catch limits and accountability measures. The 2006 MSA revision is commonly referred to as the Magnuson-Stevens Reauthorization Act or MSRA.

The PFMC is one of eight regional fishery management councils established by the MSA. Over the last 30+ years, the PFMC has developed four fishery management plans (FMPs) and has addressed a wide range of fisheries issues through amendments to those plans. The four FMPs are focused on groundfish, salmon, coastal pelagics and highly migratory species. The Groundfish FMP covers over 90 species of rockfish, flatfish, roundfish, sharks, skates, and others. Chinook and Coho are the primary salmon species addressed in the Salmon FMP, while Northern Anchovy, Market Squid, Pacific Sardine, Pacific Mackerel, and Jack Mackerel are specified in the Coastal Pelagic Species FMP. Finally, the Highly Migratory Species FMP authorizes the PFMC to actively manage tunas (North Pacific Albacore, Yellowfin, Bigeye, Skipjack, and Northern Bluefin), sharks (Common Thresher, Pelagic Thresher, Bigeye Thresher, Shortfin, Mako, and Blue) billfish/swordfish (Striped Marlin, Pacific Swordfish) and other highly migratory fishes (Dorado). The PFMC also participates in international fishery management organizations such as the International

Pacific Halibut Commission, and international commissions tasked with managing migratory tunas (Albacore, Yellowfin and other highly migratory species).

Groundfish Management

The Groundfish FMP contains the rules for managing the groundfish fishery. It outlines the areas, species, regulations, and methods that PFMC and NMFS must follow to make changes to the fishery. A biennial management process was implemented in 2003 through amendment 17 to the FMP. The biennial cycle implements management measures for a two-year period, rather than just for one year. Separate harvest specifications (allowable biological catch and optimum yield) are identified for each year in the two-year period. This cycle provides more time for PFMC and NMFS to work on other critical groundfish issues, and more time for public comment (NOAA 2006).

Groundfish are managed through numerous management measures including harvest guidelines, quotas, trip and landing limits, area restrictions, seasonal closures, and gear restrictions (such as minimum mesh size for nets and small trawl footrope requirements for certain areas). The trawl sector of the groundfish fishery recently shifted to an individual fishing quota (IFQ) system and harvest co-operative program that was implemented in 2011. This program is expected to reduce harvest capacity in the fishery, to make the trawl sector of the fishery more efficient, and to lower bycatch from trawl gear. All sectors of the groundfish fishery are currently constrained by the need to rebuild groundfish species that have been declared overfished (Canary Rockfish, Yelloweye Rockfish, Darkblotched Rockfish, Bocaccio, Pacific Ocean Perch, Cowcod and Petrale Sole). Rebuilding plans have been developed to help these species recover. Because of the low available harvest of species managed under rebuilding plans, the overall groundfish harvest has been significantly reduced.

Since 2003, several groundfish conservation areas have been implemented through regulation by NMFS to reduce overfishing on various groundfish species (NOAA 2006). A groundfish conservation area is defined by NMFS as “any closed area intended to protect a particular groundfish species or species group or species complex.” The Rockfish Conservation Areas (RCA) are the only groundfish conservation areas in the study area. The RCAs are large area closures intended to protect overfished shelf rockfish species (e.g. Canary and Yelloweye Rockfish). The RCAs have boundaries defined by specific latitude and longitude coordinates that approximate depth contours over the shelf and differ between gear types, for example trawl, non-trawl and recreational RCA, which vary throughout the year with cumulative limit periods. A core area over the shelf has been protected for more than a decade.

Based on recommendations within amendment 19 of the Pacific Coast Groundfish fishery management plan, in 2006 NMFS implemented essential fish habitat (EFH) for groundfish. To minimize impacts on ecologically important habitats of groundfish EFH, NMFS implemented areas closed to bottom trawl gear or all bottom contact gear (trawl and other bottom tending gear). There are currently 50 such closed areas on the west coast and three bottom trawl closed areas within the study area: Point Arena North and Point Arena South Closed Areas and portions of the Bottom Trawl Footprint Closure. The latter covers all areas westward of the 1280 m (700 fathom) contour out to the 3500 m (1914 fathom) contour, within the EEZ. The Bottom Trawl Footprint Closure was designed to minimize adverse fishing effects on EFH, by freezing the footprint of where trawling occurred in 2004. The PFMC is currently in the process of reviewing and updating groundfish EFH.

State Regulations

Marine Life Management Act

California's Marine Life Management Act (MLMA), which became law on January 1, 1999 (codified in scattered sections of the California Fish and Game Code), regulates the harvest of California's marine living resources, including commercial fisheries. The fishery management system established by the MLMA applies to four groups of fisheries:

1. The nearshore finfish fishery and the White Seabass fishery;
2. Emerging fisheries – new and growing fisheries that are not currently subject to specific regulation;
3. Those fisheries for which the Fish and Game Commission held some management authority before January 1, 1999. Future regulations affecting these fisheries will need to conform to the MLMA; and
4. Those commercial fisheries for which there is no statutory delegation of authority to the Fish and Game Commission and Department.

The California Aquaculture Development Act

The California Aquaculture Development Act of 1979 established the California Department of Fish and Wildlife (CDFW, formerly the California Department of Fish and Game) as the lead agency for aquaculture in the state. In 1982, legislation was passed that provided guidelines and authority for aquaculture regulations developed by the Fish and Game Commission. These guidelines and authority for aquaculture regulations are in California Code of Regulations, Title 14, Natural Resources: Division 1. Fish and Game Commission – Department of Fish and Game. These regulations are referred to as Title 14. CDFW is responsible for issuing leases and permits for specific aquaculture activities and coordinating with two committees, the Aquaculture Development Committee and the Aquaculture Disease Committee, which exist for the purpose of interaction among sectors of the aquaculture industry and government regulatory agencies.

There are several other State agencies that have regulatory authority over certain aspects of aquaculture. They include the California Departments of Health Service and Food and Agriculture (disease and health), the California State Lands Commission (CSLC) (leased lands), the California Coastal Commission (coastal uses and public recreation and access), and the State Water Resources Control Board (water quality).

4.4.3 Impact Assessment Methodology

Criteria to determine the significance of impacts on commercial fisheries are based on fisheries population benchmarks as defined by federal and state standards and regulations and social and economic factors. Impacts may be either direct or indirect and they may be short term or long term. Short-term impacts are generally not considered significant, by definition. Impacts are considered to be significant if proposed actions would result in the following:

- Reduced the number of fishing vessels allowed to fish in the area;
- Resulted in a substantial positive or negative population trend in one or more of the harvested species such that the population would be below sustainable fishing levels, as defined by fishery management plans for that species;

- Resulted in substantial economic gain or loss to commercial fisheries; or
- Conflicted with the policies and regulations established by the MSA.

The impact analysis for the commercial fisheries resources considered the potential impacts of each relevant component of the proposed action on population dynamics of commercial fish species and any operational, social, or economic impacts on the commercial fishery. Any potential impacts were compared to the significance criteria outlined above to determine if adverse impacts are expected from the proposed actions.

4.4.4 Environmental Consequences

The relevant proposed and alternative regulations and potential consequences are outlined in the following sections. The discussion is focused on regulations that would have the potential to affect commercial fishing operations or the fish populations on which the fishing industry depends.

Proposed Action

Proposed sanctuary regulations do not restrict commercial fishing practices and are therefore not expected to cause significant adverse impacts on commercial fishing resources or cause significant economic loss to commercial fisheries. However, prohibitions on vessel discharges, submerged lands disturbance, with the exception of lawful fishing activities, oil and gas exploration, introduced species, deserting vessels and, the establishment of MPWC zones may have implications for positive population trends of harvested species and commercial fisheries. The prohibitions on oil and gas exploration and submerged land disturbance are expected to provide long term beneficial ecosystem and habitat impacts that healthy commercial fisheries depend on, while select vessel discharge regulations have the potential to cause short term adverse impacts on fishing vessel operations such as fuel, time, or equipment upgrade costs that are expected to be less than significant, as described below.

Discharge Regulations

GFNMS and CBNMS have two proposed regulations related to discharges of material that would be extended into the study area that may affect commercial fishing: prohibitions on discharging or depositing of matter or materials within the sanctuaries, and from beyond the boundary of the sanctuaries that subsequently enters the sanctuaries and injures a sanctuary resource or quality. Discharge regulations affect the treatment of sewage and other materials associated with vessel operations, and may therefore result in adverse impacts on commercial fishing operations, but may also provide improvements to water quality and ecosystem health, on which thriving fish populations depend.

Current State and federal regulations limit different types of discharges into the waters of the expansion area so the addition of sanctuary regulations represents an incremental increase in restrictions on vessel discharges.

CBNMS and GFNMS regulations would prohibit in the expansion area the discharge or deposit of any matter or material from vessels within or into the sanctuary waters. The exceptions to this prohibition are:

- Fish, fish parts, chumming materials or bait used in lawful fishing activities;
- Clean effluent generated incidental to vessel use by an operable, approved Type I or II marine sanitation device (MSD) (applies to vessels less than 300 gross registered tons (GRT) or vessels 300 GRT or greater without sufficient capacity to hold sewage while in a sanctuary);

- Clean vessel deck wash down, vessel engine cooling water, vessel generator cooling water, and bilge water;
- Anchor wash; or
- Vessel engine or generator exhaust.

In addition, the proposed action includes a regulatory change for both CBNMS and GFNMS, to add an exception to the existing discharge prohibition to allow discharge of clean graywater, as defined by section 312 of the Federal Water Pollution Control Act (known as the Clean Water Act or CWA), from vessels less than 300 GRT and from vessels 300 GRT or greater without sufficient capacity to hold graywater within the sanctuaries. As per section 312 of the CWA, graywater includes galley, bath and shower water. Clean means not containing detectable levels of harmful matter; any graywater containing detectable levels of harmful matter could not be discharged into CBNMS and GFNMS and the expansion area under the proposed action.

Currently, in the expansion area, as described in Section 4.2 (Physical Resources), the USEPA established a No Discharge Zone (NDZ) for marine waters within 3 miles of the coastline (the territorial sea, as defined in the CWA), prohibiting discharge of treated and untreated sewage from: all large passenger vessels of 300 gross tons or greater; and from large oceangoing vessels of 300 gross tons or greater with available holding tank capacity or containing sewage generated while the vessel was outside of State waters (USEPA 2012). Section 312 of the CWA (33 U.S.C. § 1322) requires the use of MSDs for all vessels within 3 miles of the coast if equipped with an installed toilet. Vessels 65 feet (20 meters) and under may use a Type I, II, or III MSD. Vessels over 65 feet in length must have a Type II or Type III MSD. Smaller vessels may handle sewage by having portable toilets, portable sewage receptacles, or no toilet facilities (for these instances the use of an MSD is not required). Beyond 3 miles from shore, under current federal regulations, vessels may discharge treated or untreated sewage from any type of MSD. Discharge of untreated sewage throughout the sanctuaries would be prohibited under the regulations of the proposed action.

As per Coast Guard requirements, which enforce provisions of the CWA, all commercial fishing vessels within 3 miles of the coast with installed toilets are already required to have MSDs. Implementation of the proposed action would mean vessels transiting sanctuary waters beyond 3 miles of the coastline with installed toilets could discharge clean effluent (sewage) generated incidental to vessel use by a Type I or Type II MSD, or hold the waste in a Type III MSD (required for vessels 300 GRT and above with capacity to hold the waste). Vessels over 65 feet could only discharge through a Type II MSD. Vessel operators would be required to lock all MSDs in a manner that prevents discharge or deposit of untreated sewage.

For smaller vessels without a MSD (because they do not have an installed toilet), beside discharge of sewage outside sanctuary boundaries, discharge of sewage from a portable toilet or other sewage container into a dump station or other on-shore sewage disposal facility would be an option under the proposed action. Should a vessel owner or operator choose to install an MSD, there would be one-time costs for purchase of the device and installation, and periodic costs for maintenance, and should a dump station or other onshore sewage disposal facility be used, there would be a cost (money and/or time) each time to dispose of sewage from the vessel. Due to these factors, the proposed action has the potential to cause some adverse effects on individual commercial fishing operations. While it is not possible due to lack of

data to estimate the number of commercial fishing owners or operators that would choose these options, the number is expected to be low.

There is no way to accurately estimate costs for installing MSDs due to the wide range of vessel and MSD designs and varying labor costs. The costs of pumping out a commercial fishing or recreational vessel vary. Spud Point Marina's pump-out facility is free, per its website. The mobile pump-out prices vary depending on how far they have to travel to do the pump-out, if there are other customers that wish to also have a pump-out, and possibly volume pumped. Dump station fees could range from free to registered guests of a campground to a small fee per dump in other instances, such as from $5 to $15 (varies by facility and location). Dumping the contents of a portable toilet into a sewage receptacle (such as a toilet) would likely be free.

For vessels that hold waste in a MSD Type III and do not have a MSD Type I or II, transit times to reach areas for legal discharge may be a factor. Currently, commercial fishing vessels of 300 gross tons or greater that have available holding capacity must transit to outside 3 miles to discharge sewage from holding tanks into the ocean. The proposed sanctuary regulations would require all commercial fishing vessels that have only a Type III MSD (holding tank) to either hold their waste for the additional amount of time it would take to transit the expansion area before discharge outside of national marine sanctuary boundaries or to visit pumpout or dump station facilities. Both these options would incur additional costs to vessel owners or operators in terms of fuel and time. A vessel owner or operator also has the option to install an MSD I or II in order to release clean effluent as per proposed regulations. Choosing this option would incur a one-time cost for purchase of the device and installation, and periodic costs for maintenance. For commercial fishing vessels transiting the expansion area, these vessels would already be expending the fuel necessary to travel through the expansion area on the way to their destinations outside sanctuary boundaries. Under normal circumstances, they would incur no additional fuel costs, would move through the expansion area in a few hours, and would have the capacity to hold sewage during that time.

Overall, the impact on commercial fishing vessels from the prohibitions on sewage discharge from an MSD III has the potential to cause an adverse impact on individual commercial fishing operations if a vessel owner or operator purchases and installs an MSD I or II, or transits long distances to reach a pumpout facility or areas outside of national marine sanctuary boundary to properly dispose of sewage. It is not possible, due to lack of data to estimate the number of commercial fishing owners or operators that would need to choose these options, the number is expected to be low and therefore the impacts are considered less than significant.

The proposed sanctuary regulations on discharges also affect other vessel discharges beyond discharge of sewage and include but are not limited to, discharge of graywater, bilge water, and solid waste.

Graywater discharges from commercial fishing vessels, until recently, were exempt from the NPDES vessel program, known as the 2008 Vessel General Permit (VGP). The amended 2013 VGP, which went into effect on December 19, 2013, does not extend the exemption to commercial fishing vessels; commercial fishing vessels are eligible for coverage under the VGP. As of December 8, 2011, a small Vessel General Permit (sVGP) has been proposed by the USEPA (but not finalized as of August 2013), to cover all vessels (except recreational and vessels of the Armed Forces of the United States) less than 79 feet in length; a number of fishing vessels are in that size class. According to the 2013 VGP, graywater mixed with sewage

discharges from oceangoing vessels of 300 gross tons with sufficient holding capacity are prohibited in State waters (a California-specific VGP requirement). Under the VGP, vessels greater than 400 gross tons that regularly travel more than one nm from shore that have the capacity to store graywater for a sufficient period, graywater must be discharged greater than one nm from shore while the vessel is underway, unless they meet treatment standards and other requirements of the VGP. Vessels that do not regularly travel more than one nm from shore should minimize the discharge of graywater and, provided the vessel has available graywater storage capacity, must dispose of graywater onshore if appropriate facilities are available and such disposal is economically practicable and achievable.

As described above, the proposed sanctuary regulations for discharges have an exception for clean graywater discharges, for vessels less than 300 GRT and vessels 300 GRT or greater without sufficient capacity to hold graywater in all waters of the expansion area and the existing GFNMS and CBNMS boundaries. Graywater containing detectable levels of harmful matter could not be discharged in the expansion area or existing sanctuaries. Similar to the holding tank capacity issue for sewage discussed above, commercial fishing vessels with holding tanks for graywater would be expected to store graywater that contained detectable levels of harmful matter in holding tanks and either transit beyond the boundaries of the expansion area to discharge it, incurring fuel and time costs, or they would need to access a pumpout facility, incurring fuel and time costs to reach the pumpout facility and possibly a cost each time to pump out graywater. Vessel owners without sufficient capacity to hold graywater, provided that it did not meet the definition of clean, could consider upgrading their holding tank capacity. For commercial fishing vessels transiting the expansion area, these vessels would already be expending the fuel necessary to travel through the expansion area on the way to their destinations outside the boundaries. Under normal circumstances, they would incur no additional fuel costs, would move through the expansion area in a few hours, and would have the capacity to hold graywater containing detectable levels of harmful matter during that time.

Overall, the prohibition on graywater discharges that do not meet the definition of clean has the potential to cause an adverse impact on individual commercial fishing operations if a vessel owner or operator chooses to upgrade holding tank capacity or is required to transit long distances to reach a pumpout facility (which could entail a cost each time to use) or areas outside of national marine sanctuary boundary to properly dispose of graywater. Should a vessel owner or operator choose to upgrade holding capacity, there would be one-time costs for purchase of the equipment and installation, and periodic costs for maintenance. While it is not possible, due to lack of data to estimate the number of commercial fishing owners or operators that would need to choose these options, the number would likely be limited, and therefore the impacts are considered less than significant.

As per the Oil Pollution Act and the CWA, vessels are prohibited from releasing any discharge, bilge or other, with an oil content greater than 15 parts per million within 12 nm (14 miles) of land; or bilge water has an oil content greater than 100 ppm and the vessel is beyond 12 nm of land. Vessels of 300 gross tons or more may not release oily bilge water within State waters.

Proposed sanctuary regulations for the expansion area would prohibit the discharge of bilge water with the exception of clean (free of harmful matter) bilge water. Commercial fishing vessels are already required to adhere to clean bilge discharges according to the Oil Pollution Act and CWA within the expansion area, with stricter requirements for bilge discharges within 12 nm. It is expected they could refrain from

discharging any non-clean bilge water in the entire expansion area and that there might be minor impact of the proposed regulation on bilge water discharges from commercial fishing vessels.

Solid waste is another type of discharge from vessels that occurs in the expansion area and includes food waste, cans, glass, wood, cardboard, and paper. The Act to Prevent Pollution from Ships (APPS) and CWA regulate solid waste discharge, while the International Convention for the Prevention of Pollution from Ships (MARPOL) regulates the disposal of plastics and garbage. Under these regulations, the disposal of plastics is prohibited in any waters and disposal of other materials are prohibited within 12 nm of the coast. Other garbage, such as food waste, paper and metal may be disposed of beyond 12 nm, with disposal of garbage ground to pieces under an inch allowed beyond 3 nm from shore.

Commercial fishing vessels discharging fish, fish parts, chumming materials or bait as part of lawful fishing activities are exempt from the proposed sanctuary regulations. In addition, discharge of plastics in the expansion area is currently prohibited, so there would be no additional impact on commercial fishing vessels from the proposed regulations regarding plastic discharge. The amount of food waste generated by commercial fishing vessels during transit of the expansion area would not impact the ability of the vessels to store it and discharge it onshore or once outside the sanctuary, beyond 3 nm from shore (ground garbage) or 12 nm from shore (unground garbage).

Because commercial fishing operators are already expected to adhere to the regulatory regime for disposal of most solids within 12 nm, it is expected they can adhere to the proposed sanctuary regulations for the incrementally larger area that would result from expanding the sanctuary boundaries with minor impacts to their operations. Vessel owners could choose to take measures to reduce on-board waste streams or upgrade equipment if additional storage capacity was needed, which could involve changes to vessel waste generation practices, one-time equipment costs, and maintenance costs. While such measures have the potential to cause some adverse effects, the proposed action's overall effects on the commercial fishing industry would be less than significant.

Finally, commercial fishing vessels would only be allowed to use "clean" (free of harmful matter) materials in deck or anchor washing if they wish to allow the washings to drain into the sanctuaries. Adhering to this requirement is not expected to cause adverse impacts on operations of commercial fishing vessels.

The beneficial water quality impacts that result collectively from sanctuary discharge regulations would likely have minor benefits for commercial fish species within the expansion area. Fish species would be exposed to fewer contaminants and bacteria, and would therefore potentially have a reduced risk of health problems. Better water quality would also create better habitat in the long term, which would benefit fish populations and potentially result in increased reproductive success and increases in population sizes.

The second discharge regulation prohibits discharging or depositing any material or other matter from beyond the boundary of the sanctuary that subsequently enters the sanctuary and injures a sanctuary resource or quality. The exceptions to this proposed regulation are the same exceptions as for discharging or depositing within the sanctuary, including discharges for fish, fish parts and chumming, as part of lawful fishing activities. Similar to the first discharge regulations discussed in this section, this proposed regulation would have minor beneficial impacts on fish species populations and their respective commercial fisheries from a decrease in pollution entering and impacting sanctuary resources, including fish. The proposed

regulations have the potential to cause adverse impacts on commercial fishing operations as there may be instances when commercial fishing owners or operators may need to store wastes that contain harmful matter (as defined in the proposed regulations) and dispose of them onshore or farther from the sanctuary, if the wastes could enter the sanctuary and cause injury to sanctuary resources. However, these requirements would have minimal impacts on commercial fisheries. Overall, the improvements in water quality and associated benefits would have minor beneficial impacts to fisheries.

In summary, extending discharge regulations into the expansion area would have long term, minor beneficial impacts on commercial fish species and their habitat but may have short term adverse impacts on individual commercial fishing operators, particularly from prohibitions of sewage and, to a lesser extent, from graywater discharges containing detectable levels of harmful matter. The proposed regulatory change has the potential to cause limited economic loss to individuals within the commercial fishing industry; therefore, it is considered to create a less than significant adverse impact on commercial fisheries.

Submerged Lands Regulations

Extending existing regulations to the study area would include a prohibition on drilling into, dredging, or otherwise altering the submerged lands; or constructing, placing, or abandoning any structure, material or matter on the submerged lands, except as incidental and necessary for anchoring any vessel or lawful use of any fishing gear during normal fishing activities. Exceptions include anchoring of vessels while conducting lawful fishing activity or, in GFNMS, mariculture activities conducted pursuant to a valid lease, permit, or license or other authorization issued by the State of California. This proposed regulation would not create an adverse impact on commercial fishing operations, since lawful fishing activities are exempt from the prohibition. Although the lawful use of fishing gear is exempt from the proposed regulation, fishing in the study area is otherwise regulated by NMFS or CDFW.

Installing moorings is prohibited by the regulations of GFNMS and CBNMS, because of the potential for submerged lands disturbance. In addition, the potential for improper disposal of human waste or discharges of fuel, oil, and toxic materials from vessels using the moorings is also of concern. Derelict or abandoned moorings also pose a threat to navigation. Any existing or future moorings installed by fishing vessels within the State waters of the study area require a valid lease as per State law. Fishing vessel owners in need of a mooring are required to apply for a mooring lease from California State Lands Commission (CSLC), for which the sanctuary would then authorize the mooring under proposed sanctuary regulations. The proposed change to mooring installations would have minor beneficial impacts on fish species populations and their respective commercial and recreational fisheries from an increase in habitat enhancement and ecosystem function from a comprehensive mooring plan. These requirements may pose a minor burden on boat owners, but would not cause a substantive economic loss to the commercial fishing industry.

In summary, these regulations would provide added protection to the benthic habitats of the study area, would prevent a further loss and degradation of habitats, and improve the overall health of the ecosystem of the study area. The regulations would cause a minor beneficial impact on commercial fishing from habitat enhancement, and a minor burden for vessel owners needing a mooring lease.

Oil, Gas, and Mineral Regulations

Extending the sanctuary-prohibition on exploring for, developing or producing oil, gas, and minerals to the expansion area would secure the study area from the potential detrimental environmental impacts from this type of activity and ensure a healthy and thriving ecosystem that supports valuable commercial fisheries. Exploration of oil and gas operations present several methods for introducing toxins and oil into the marine environment, e.g., accidental spill, seepage during operations, etc. Oil and other toxins are detrimental to most marine species, including fish. Oily and toxic waste discharges can have direct significant adverse impacts (e.g., death or illness) on fish populations or they can have indirect impacts from long-term habitat degradation and reductions in prey availability. Also, offshore oil and gas facilities can preclude fishing from areas where such facilities (e.g., platforms, pipelines, offshore storage and treatment) are located. Thus, any proposed measures that create a stricter regulatory environment with regard to oil, gas, and minerals would have the potential to protect habitat and water quality, benefit fish populations by maintaining ecosystem conditions within the sanctuaries, and protect established fishing grounds.

Introduced Species Regulations

Controlling introduced species could have both beneficial and adverse effects on fisheries. The proposed regulations, which are the same as the existing sanctuary regulations, would prohibit the release of introduced species (except striped bass released during catch and release fishing activity). In GFNMS, there would be a second exception for existing mariculture, which currently takes place within the existing sanctuary boundaries. The prohibition of introduced species could benefit commercial fisheries in the expansion area by limiting the competition between introduced and native species, thus improving the ongoing stability of the native fish populations, improving stability in the numbers of native fish species available for catch, and helping to stabilize the potential for future revenues derived from commercial catch. In this regard, the proposed regulation would have a beneficial impact on commercial fisheries.

One of the pathways for the introduction of species is through commercial fishing operations, specifically, baiting. The proposed regulation would potentially require commercial fisheries to alter their baiting methods so as to reduce the likelihood for the release of introduced species into the sanctuaries. In theory, these alterations may increase the burden on the fisheries, but no known non-native species are currently being used as bait in the study area. Therefore, this requirement may have either no impact or minor adverse impacts on commercial fisheries.

Regarding mariculture, as noted in the affected environment discussion, future mariculture activities would be subject to NOAA oversight under NMSA and, in federal waters, MSA authority. In CBNMS, there would be no mechanism to allow mariculture that involved introduced species, which is consistent with existing sanctuary regulations. Because there are no existing or planned mariculture operations in the CBNMS expansion area, the proposed regulation would not negatively impact mariculture operations. Mariculture would be handled differently in GFNMS. In addition to the GFNMS introduced species exception for existing permitted mariculture, the proposed GFNMS regulations include a provision that would allow authorization of non-invasive introduced species shellfish mariculture in State waters, should this use be proposed in the future. Although, there are no existing or planned mariculture uses in the proposed GFNMS expansion area, there would be a mechanism to authorize such uses in State waters in the future. Impacts on commercial fishing would be negligible for such activities.

In summary, the proposed introduced species regulation could benefit native fish populations upon which the commercial fishing industry depends. However, minor adverse impacts on the fishing industry from limiting the choice of bait to only native species may occur. The proposed regulation is expected to have both beneficial and minor adverse impacts on commercial fisheries or mariculture operations**.**

Deserted Vessels

The proposed regulation for the GFNMS expansion area would prohibit vessels from being deserted, and prohibit leaving harmful matter (hazardous materials or wastes) aboard grounded or deserted vessels in the study area. Although CBNMS regulations do not include this specific provision, CBNMS (and GFNMS) regulations would prohibit abandoning any structure, material or other matter on or in the submerged lands in the study area, as described under the submerged land regulations (above). Extending these regulations may have some minor adverse impacts on the commercial fishing industry, as it would place an additional economic burden on vessel owners to ensure that a capsized or otherwise incapacitated vessel be salvaged and not abandoned and to ensure that any hazardous substances are removed from an abandoned vessel. However, the intent of this regulation is to ensure that vessel owners take responsibility for their vessels before additional damage can be done to marine resources. While this may be a burden for the vessel owner, the overall risk of an individual boat being abandoned is relatively small, and the impact on the commercial fishing industry as a whole is considered minor. Reducing the risks of hazards posed by abandoned vessels would have beneficial effects on fisheries and fishing operations and activities.

MPWC Zones

With the establishment of zones for MPWC use, the activity of fishing using MPWCs as a platform would be allowed to continue within those zones, provided the MWPCs complied with sanctuary regulations. MPWC use by all operators, including those pursuing commercial fishing operations would not be allowed outside the MPWC zones. MPWC operators that are exempt from this proposed provision are the National Park Service, U.S. Coast Guard, Fire or Police Departments or other Federal, State or local jurisdictions during emergency search and rescue missions or law enforcement operations.

While it is not possible, due to lack of data to estimate the number of commercial fishers who conduct their operations using MPWCs as their only platform, the number is likely limited, and therefore the impacts are considered less than significant.

Overall, the impact of the proposed action on the commercial fishing industry is expected to provide long term beneficial ecosystem and habitat impacts that healthy commercial fisheries depend on, while select regulations have the potential to cause short term adverse impacts on fishing vessel operations that are expected to be less than significant, as described above.

No Action Alternative

The No Action alternative would maintain the status quo. There would be no added benefits to commercial fish species due to no change in actions regarding water quality, benthic habitat or ecosystem function; and there would not be any adverse economic or operational impacts on owners or operators of fishing vessels in the study area.

Existing Regulations Alternative

Applying the existing regulations, particularly the prohibition on oil and gas exploration and altering of the submerged lands, with the exception of lawful fishing activities, is expected to protect the expansion area from potentially harmful environmental impacts as the result of these of activities and ensure in the long term healthy habitats and a thriving ecosystem that support the harvest of valuable commercial species. The beneficial impacts would be similar to those impacts described for the proposed action with a few differences.

Under this alternative, there would be no exception for clean graywater discharges, so all vessels would be required to hold graywater while transiting the expansion area. Applying regulations as they relate to select prohibitions on vessel discharges to the expansion area have the potential to cause short term economic loss to individual commercial fishery operators with a less than significant impact on commercial fisheries. These adverse impacts would be similar to those impacts described for the proposed action, though all vessel operators would need to take measures to hold graywater in the expansion area, which, for vessels without sufficient holding capacity, could necessitate equipment upgrades or fees to discharge to a reception facility.

In addition, the use of MPWCs would be prohibited in the expansion area. The use of this type of vehicle as a platform from which to commercially fish would not be allowed. The impact of the MPCW regulation on the commercial fishing industry as a whole is expected to be limited.

Also, without the ability to authorize mooring leases from CSLC after the expansion became effective, any existing commercial fish moorings with such leases would need to be certified within 60 days of completion of the boundary expansion (using the existing certification mechanism of GFNMS). Any future moorings installed by fishing vessels within the State waters of the study area would require a valid lease as per State law and could be issued a sanctuary permit if a GFNMS mooring plan, similar to the plan developed for Tomales Bay were developed and adopted by CSLC, the California Coastal Commission and/or other federal, State, or local authorities of competent jurisdiction. Other differences in this alternative would not affect commercial fishing.

Overall, the impact of this alternative on the commercial fishing industry is expected to be similar as the proposed action, such that it provides long term beneficial ecosystem and habitat impacts that healthy commercial fisheries depend on, while select regulations have the potential to cause short term adverse impacts on fishing vessel operations that are expected to be less than significant.

Arena Cove Alternative

This alternative could be implemented either with the proposed action or the existing regulations alternative. For this alternative, the footprint of the expansion area is slightly increased, as the entire area of Arena Cove would be included in GFNMS. Any increases in beneficial effects on water quality, benthic habitat or ecosystem function from this increase in area protected are minor compared to both the proposed action and the existing regulations alternative. The adverse effects on the operational activities of individual commercial vessel owners may increase slightly, as the footprint of the sanctuary expansion area is larger. Under the proposed action, any fishing vessel owners or operators with a lease for a mooring would also need to acquire a Letter of Authorization from the sanctuary for the leased mooring. This requirement

may pose a minor administrative burden on commercial fishing boat owners, but would not cause a substantive economic loss to the commercial fishing industry. There would be no authorization ability in the GFNMS regulations under the existing regulations alternative.

Overall, the impact of this alternative on the commercial fishing industry is expected to be similar as the proposed action, such that it provides long term beneficial ecosystem and habitat impacts that healthy commercial fisheries depend on, while select regulations have the potential to cause short term adverse impacts on fishing vessel operations that are expected to be less than significant.

MPWC Zones Alternative

Applying the regulations as part of the MPWC zones alternative would yield the same long term beneficial impacts on habitats and ecosystems of harvested fish populations and the same short term adverse impacts on commercial fisheries as the proposed action. As noted, the activity of fishing using MPWCs as a platform would be allowed to continue within MPWC zones; the slight variations in the boundaries of the MPWC zones in this alternative would not change the conclusions of the impact analysis for the proposed action.

4.5 Cultural and Maritime Heritage Resources

A cultural resource is defined as any historical or cultural feature, including archaeological sites, historic structures, shipwrecks, and artifacts. Historical resources are defined as any resources possessing historical, cultural, archaeological or paleontological significance, including sites, contextual information, structures, districts, and objects significantly associated with or representative of earlier people, cultures, maritime heritage, and human activities and events. Historical resources include "submerged cultural resources," and also include "historical properties," as defined in the National Historic Preservation Act (NHPA), as amended, and its implementing regulations, as amended.

Submerged cultural resources are defined loosely as archaeological or culturally significant sites over fifty years old that are located underwater. These sites may include shipwrecks, downed airplanes, or submerged structures within the more recent historic period, or may include sites dating to the prehistoric period consisting of campsites with stone tools or stones used for grinding.

The study area for the proposed sanctuary expansion, including the adjacent coastline, comprises a diverse representation of cultural and maritime heritage resources, which are defined as tangible and intangible cultural resources that reflect humanity's interactions with the marine environment, including maritime cultural landscapes and elements such as shipwrecks, lighthouses, life-saving stations, seacoast fortifications, shipyards, waterfront piers, wharves, docks, marine manufacturing facilities, sailor boarding houses — in short, all physical and cultural manifestations of the use of the water for trade, commerce, recreation, warfare, immigration, etc.

4.5.1 Regional Overview of Affected Environment

The maritime cultural landscape is the term used for the archaeological concept combining sea and land; it means that the starting point for the subject of maritime archaeology is maritime culture. The concept also embodies the study of how the maritime environment shapes culture and how the culture reflects and interacts with the marine environment (Westerdahl 1998). The maritime cultural landscape for the study area can be separated into three broad categories: precontact history, ethnohistory and history. Precontact history describes events prior to European exploration and influence in the Americas. Ethnohistory represents information gleaned from ethnographic sources (including oral histories and anthropological and sociological studies) and historical accounts of Native American groups. History is generally postcontact information gathered from written documents from the time of early European exploration until today. The study area is rich in cultural and archaeological resources and has a long and interesting maritime past.

It is generally believed that human occupation of the West Coast dates back to at least 13,000 years before present (BP). Several sites around California are thought to have been occupied between 40,000 to 200,000 years BP; however, the reliability of the dating techniques used and the validity of the artifacts found in those sites remain controversial (Moratto 1984). It is widely held that prehistoric shorelines extended far out onto the continental shelf, and it is probable that the remains of California's earliest settlements were inundated following the last Ice Age. Archaeological evidence for occupation of California during the Holocene Epoch (13,000 years BP to present) is stronger. Miwok and Kashia (an alternate spelling is *Kashaya*) Pomo once lived and harvested the resources of an abundant marine landscape that was inundated

by sea level rise with the end of the last great Ice Age, reflecting prehistoric human persistence and adaptation to a changing climate.

The study area's rich pelagic and shore-side marine resources provided sustenance for the Coast Miwok and Kashia Pomo peoples who have lived there for thousands of years. The heritage of the first peoples is today represented not only in the sites of former settlements but also by the traditions and legacy of those people, who have persisted as important members of the coastal community. The Federated Indians of Graton Rancheria (both Southern Pomo and Coast Miwok people) maintain tribal lands at the Graton Rancheria; the Kashia Band of Pomo Indians maintains tribal lands at Stewarts Point Rancheria; and the Manchester Band of Pomo Indians maintains tribal lands at the Manchester-Point Arena Rancheria. Their place names, their memories and their traditions remain on these shores and waters.

Traditional knowledge and archaeological evidence indicates that the coastal peoples subsisted largely on the products of the marine environment — harvesting salt, kelp, marine mammals, shellfish and fish. The basis of accumulated wealth in addition to food resources was the processed shell of mollusks such as the Bodega Bay clam (*Saxidomus giganteus*) (Merriam 1910).

Following Spain's "discovery" of the Pacific Ocean in 1513, early Spanish explorers took to that ocean beginning in 1527. Among those voyages that followed were explorations by mariners such as Juan Rodríguez Cabrillo, Sebastian Rodríguez Cermeño, and Sebastian Vizcaíno in 1542-1543, 1595 and 1602 that studied and visited the California coast, while others crossed the Pacific to commence a transoceanic trade with the Philippines after 1565 (Mathes 1968). In the two centuries that followed, the "Manila galleons" and other Spanish ships made regular landfall on the northern California coast in or around Cape Mendocino before turning south to bear for Acapulco (Gearhart et al. 1990).

Maritime voyages of the late 1700s that explored the coast included that of Juan Perez (1775), which charted Bodega Bay, as well as exploration and charting by nations and empires wishing to challenge Spanish and later Mexican political and economic domination. These included voyages by British explorer George Vancouver (1792-1795) and French explorer Jean-François de Galaup (1786). At the same time, voyages by Americans began to reach California's shores, mostly in search of seal furs.

As the influx of foreign ships continued and as the region transitioned to American rule following the Mexican War (1846-1848) and prospered following the Gold Rush (1849-1855), ports, such as San Francisco and Monterey, and smaller coastal harbor towns from Bodega Bay to Point Arena were developed through fishing, lumber trade, coastal shipping, and economic exchange. Regional fishing communities dating back to the middle of the 19th century are distinctive for their rugged, individualistic culture born of a hard and sometime dangerous life harvesting fish at sea. It is an area strongly shaped and influenced by the offshore marine environment as well as inshore kelp forests and marine terraces which provided fisheries and habitat for marine mammals.

The rich pelagic resources of this maritime landscape, particularly the kelp forests in the numerous coves and inlets that provided habitat for the California sea otter (*Enhydra lutris nereis*), and this area's ocean-influenced climate's benefits for agriculture brought the Russian American Company to the coast in the early 19th century to hunt otters for their fur, and ultimately to establish settlements for agriculture and as a base for their sealing operations.

The maritime fur trade also changed the cultures of the native peoples. In California, the trade and the arrival of the Russians had a particular impact on the Kashia Pomo, whose major village, *Meteni*, became the site of the Ross Colony, or Fort Ross, a thriving Russian-American Company settlement from 1812 to 1841 and a successfully functioning multi-cultural settlement for some thirty years.

A separate settlement was made inland of "Port Rumiantsev," or Bodega Bay, where two shoreside warehouses and a dock occupied the lands of the Coast Miwok. At Fort Ross, the Kashia lived, worked and intermarried among the Aleuts and Russians in a multicultural community (Ogden 1941).

The Aleutian kayak, referred to as *baidarkas*, was an Aleut watercraft that consisted of a skeleton covered with skillfully lofted and fitted sheath of split walrus, sea lion, or seal hide. California models were maintained, repaired and constructed at the Russian shipyard in the valley below Fort Ross. Russian and Aleut farmers and fur traders established agricultural outposts and a fortified settlement from which hunters on *baidarkas* hunted the marine mammals to near-extinction, working in the numerous small coves and kelp forests of this area before venturing farther south to the Farallones and into San Francisco Bay. Their place names, the standing and reconstructed buildings of Fort Ross (the first Russian Orthodox chapel south of Alaska, the stockade, and four other buildings called the Kuskov House, The Officials Barracks, and two corner blockhouses), and the archaeological remains of their other settlements and camps at Bodega Head and along the coast remain as a reminder of them and their activities (Delgado 2013). "Today many Kashaya still reside on the reservation [at Stewarts Point Rancheria] and in areas surrounding Fort Ross. Although the majority live and work in the principal cities of Sonoma County, many have gone on to continue their careers in the greater Bay Area. Presently a growing number of Kashaya occupy positions of political and educational leadership among the Indian and non-Indian communities of this region. Many of their numbers are to be found in the educational, academic, health care, social services, and administrative professions. Although the Kashaya are contemporary California Indians in a modern and fast moving world, they still retain their strong feelings of attachment to their ancestral land and the way of life that was so long enjoyed by their ancestors" (Fort Ross Conservancy 2003).

The coastal region and its maritime cultural landscape retain, in addition to their traditions and historical knowledge, indigenous place names noted by George Davidson of the U.S. Coast Survey and marked on manuscript survey charts (T sheets) in NOAA's archives — names phonetically rendered like *Otono* Cove, *Meteni* Cove (and *Meteni*, a major village), *Chitono* Cove, *Tsukai* Cove, *Wallala*, and *Sulmawi* Cove.

Ocean-based commerce and industries are important to the maritime history, the modern economy, and the social character of this region. Here the cold sea merges with warm air from the coastal hills and valleys to pull in thick blankets of fog that created an ideal climate for the growth of the redwood forests. By 1870, the coast was lined with dozens of camps and settlements that shipped goods in small, two-masted schooners that easily navigated the rocky shoreline to load at the end of wire-rope "chutes" in ports known as "dogholes" because they were so small that a "dog had enough room to go in and back out." The use of two-masted schooners also spurred the development of small shipyards along the coast, including one at Point Arena.

People adapted to the rugged maritime environment utilizing these small maneuverable schooners that hugged the coast to log the redwoods and carry the timber to markets as close as San Francisco and as distant as the U.S. Eastern Seaboard, Australia and Asia (McNairn and MacMullen 1945). The only high-

way to create that economy was the sea, with vessels working the coast before heading to Cordell Bank and thence turning south to commence their run into San Francisco Bay. That trade left not only place names and the archaeological remains of the dogholes and those vessels unlucky enough to be lost on these shores, but also lasting communities like Bodega Bay, Fort Ross, Timber Cove, Stewart's Point, Iversen's Landing in Sonoma County and Gualala and Point Arena in Mendocino to name a few (Sullenberger 1980). Submerged archaeological remnants relating to the many landings, wire, trapeze loading chutes and offshore moorings likely exists in the study area, and would add significant knowledge about the vessel loading operations for these unique doghole ports.

These interactions and overlapping activities have left physical as well as cultural traces ranging from place names, ocean highways no longer traveled, coastal settlements, industrial structures, and shipwrecks to form a maritime cultural landscape which is unique and nationally important. This coast is a perfect illustration of how the offshore ocean connects with the shore, and beyond, in terms of humanity's engagement with the marine environment.

This was a region which helped build not only California, but the nation's economy and communities, but which also became a place settled by people who came from around the world to establish on these shores themselves and their families. It is the location of prominent and long standing landmarks for international and national maritime traffic, connecting to offshore Cordell Bank and Point Reyes as a key intersection in shipping traffic from hundreds of years ago to today, with place names forgotten as well as still known place names left by Spanish, Russian, British and American mariners.

The dangers of the rugged shoreline inspired the mapping of the coast as well as the construction of the Point Arena lighthouse, the placement of buoys and other markers, and the placement of a life-saving station at Point Arena to assist those in peril on the sea. Despite charts and experience, some ships that navigated this ocean highway came to grief as a result of storms, fog, and mistakes in navigation that led to shipwrecks.

The largest concentrations of shipwrecks in the study area are off Point Arena. Spanish explorer Ferrelo named it Punta de Cabos in 1543, but by the 17th century Spanish sailors crossing the Pacific and sighting it called it the Barra de Arena (Sand Point) or Punta Delgada. George Vancouver misspelled it Barro de Arena in 1792 and that name persisted on American charts through 1851. The U.S. Coast Survey finally set the name as Point Arena in 1853.

Records indicate that over 200 vessel and aircraft losses were documented between 1820 and 1961 along California's north-central coast from Bodega Head north to Point Arena's contiguous waters (see Table 4.5-1). Some of the sites have been located and inventoried by the National Park Service and California State Parks, as well as recreational SCUBA divers (ONMS 2013). Shipwrecks include vessels lost while sailing to and from the north coast doghole ports. These shipwrecks as well as other cultural ties including family and business relationships, demonstrate the interconnected nature of maritime activity that strongly linked communities such as Point Arena, or Gualala, with the city and port of San Francisco.

The earliest known shipwreck in the study area is a Russian brig lost off Point Arena. On June 4th, 1820 the company brig *Il'mena* weighed anchor at Sitka, Alaska and set sail for the Ross settlement. The ship carried 25 passengers and a cargo of supplies consisting largely of materials for outfitting the brig *Buldakov*,

then lying on the launching ways at the Ross shipyard. The voyage was uneventful until June 18th when landfall was made off the northern California coast. Just before midnight of that day, the *Il'mena* became trapped behind the cape and projecting reef of present day Point Arena and after several desperate but failed tacking maneuvers, the ship grounded in the surf zone just north of the cape. Passengers and crew were quickly transferred to shore where they spent the remainder of the night in the shelter of the small sand dunes that parallel the shoreline (Allan 2013).

One submerged historic property, SS *Pomona*, was listed on the National Register of Historic Places in 2008; the shipwreck is located in Fort Ross Cove, Sonoma County, partly in a California State Park. The steamship *Pomona* was built in 1888 by the Union Iron Works in San Francisco for the Oregon Improvement Company. The passenger-cargo steamer was a single-propeller, steel-hulled vessel that traveled between San Francisco and Vancouver, British Columbia making stops at ports in between. On March 17, 1908, the SS *Pomona* was transiting northward on a routine voyage encountering heavy seas when it struck a reef off Fort Ross. Captain Swansen, *Pomona*'s master, tried to save the vessel by running it aground in Fort Ross cove, but impacted a wash rock inside the cove and sank. Over the subsequent months, salvage efforts were conducted on the ship, and eventually she was dynamited as a navigational hazard. Today, the wreckage of SS *Pomona* lies in less than 50 feet of water in Fort Ross Cove (ONMS 2013).

Table 4.5-1. Known Shipwrecks and Lost Aircraft within Study Area

Location	Type	Name	Year Lost	Official No.
Arena Cove, north side of harbor	Schooner	*Sara Alexander*	1889	115922
Bodega Head, 5 miles northwest of	U.S. Military Aircraft	Avenger TBM-3	1944	22945
Bodega Bay, 7 miles north of	Steam Schooner	*Newburg*	1918	130779
Bodega Bay, off	Motor Fishing Vessel	*Eight Bros*	1937	220563
Bodega Head	Schooner	*Joseph*	1880	75800
Bodega Head, 12 miles off	U.S. Military Aircraft	Helldiver SB2C-4	1944	20261
Bodega Head, 150 yards offshore	Steam Schooner	***Albion River***	1903	107737
Bodega Head, 6.5 miles north	Barge	*Caroga*	1953	259176
Bodega Head, off	Schooner–Tern Rig	*Volunteer*	1906	161573
Bodega, near	Brig	*Marshall*	1859	
Bowens Landing	Brig	*Wolcott*	1863	
Bowens Landing	Schooner	*Flying Mist*	1867	9589
Bowens Landing	Schooner	*Free Trade**	1871	9848
Bowens Landing	Schooner	*Artful Dodger*	1877	1170
Bowens Landing	Schooner	*Mary Hart*	1878	17412
Bowens Landing	Schooner	*California**	1880	5155
Bowens Landing	Schooner	*Nidaros*	1882	18541
Bowens Landing	Schooner	*California*	1888	5757
Bowens Landing	Schooner	*Ellen Adelia*	1890	7984
Bowens Landing	Schooner	*Bill the Butcher**	1893	2755
Bowens Landing	Schooner	*Caroline Medan*	1883	5725
Bowens Landing, about 4 1/2 miles off	Schooner	*Emily Stephens*	1882	135388
Bowens Landing, small cove	Schooner	*A. J. Monje*	1869	
Caspars Reef or Saunders Reef	Steam Schooner	*Caspar*	1897	126518
Del Mar Landing	Steam Schooner	*Santa Barbara**	1905	117003

Table 4.5-1. Known Shipwrecks and Lost Aircraft within Study Area

Location	Type	Name	Year Lost	Official No.
Del Mar Landing, 1/4 mile southeast	Steam Schooner	***Klamath***	1921	206801
Duncan's Landing	Schooner	*Emma Adelia*	1872	7984
Duncan's Landing	Schooner	*Sovereign*	1873	23175
Duncan's Mill	Schooner	*Glenarm*	1875	10733
Fish Rock	Schooner	*North American*	1859	
Fish Rock	Schooner	*Cochief*	1863	
Fish Rock	Schooner	*Sarah Louise*	1875	23173
Fish Rock	Schooner	*David and Ettie**	1878	6893
Fish Rock	Schooner	*Osceola*	1880	19145
Fish Rock	Schooner	*Mary Zephyr*	1882	17418
Fish Rock	Schooner	*Stranger**	1882	2032
Fish Rock	Scow Schooner	*H. Bendel*	1888	95295
Fish Rock	Schooner Yacht	*Ariel*	1888	105374
Fish Rock	Schooner	*Cochief*	1889	
Fish Rock	Schooner	*Charlotte*	1889	5144
Fish Rock	Schooner	*Ester Cobos**	1889	135342
Fish Rock	Schooner	*John McCullough*	1893	75521
Fish Rock	Schooner	*Rio Rey**	1900	110864
Fish Rock	Schooner	*Rio Rey*	1901	110864
Fish Rock	Steam Schooner	*Crescent City*	1903	126014
Fish Rock	Steam Schooner	*Brooklyn**	1916	31705
Fish Rock	Tramp Steamer	***Orteric***	1922	141907
Fish Rock Reef	Steam Screw	*Arispe*	1854	
Fish Rock Reef	Brig	*Donna Maria*	1854	
Fisks Mill	Schooner	*Carolita*	1876	5539
Fisks Mill	Schooner	*Gracie B. Richardson*	1888	85889
Fisks Mill	Schooner	*Archie and Fontie*	1902	106742
Fort Ross	Schooner	*Sacramento*	1844	
Fort Ross	Ship	***Joseph S. Spinney***	1892	75678
Fort Ross	Steam Screw	***Whitelaw***	1893	80942
Fort Ross	Schooner	*J. Eppinger*	1901	76710
Fort Ross	Pass Cargo Steamer	***Pomona***	1908	150444
Fort Ross	Schooner	*Osceola**	1875	19145
Fort Ross Landing	Fishing Vessel	*Riga*	1932	230590
Fort Ross, 1 1/2 miles from	Schooner	*Arab**	1882	1517
Fort Ross, 3 miles south	Pass/Cargo Steamer	*Monterey*	1880	90211
Gualala	Schooner	*Three Sisters*	1880	24795
Gualala Point, southwest of	Freighter	***Dorothy Wintermote***	1938	216365
Gualala River	Schooner	*Skylark*	1876	23183
Horseshoe Point	Freighter	***Norlina***	1926	212840
Iversen's Landing	Scow Schooner	*S. Danielson*	1903	115945
Iversen's, Rough and Ready	Schooner	*Ida Florence**	1883	12447
Iversens Landing	Schooner	*Rosalie*	1883	

Table 4.5-1. Known Shipwrecks and Lost Aircraft within Study Area

Location	Type	Name	Year Lost	Official No.
Iversens Landing	Schooner	*Arthur*	1890	105384
Iversens Landing	Schooner	*Betty Danielson*	1902	
Iversens Landing	Schooner	*Davidson*	1903	
Iversens Landing, Rough and Ready	Schooner	*Olivia Schultz*	1883	19488
Iversens Landing, Rough and Ready	Schooner	*Anne*	1877	1193
Iversens Landing, Rough and Ready	Schooner	*Solano*	1877	234482
Iversens Landing, Rough and Ready	Schooner	*Ida Florence*	1890	12447
Jenner Point, 2 miles west	U.S. Military Aircraft	Hellcat	1945	43056
Manchester Beach	Fishing Vessel	*Santa Rosalia*	1950	
Point Arena	Pilot Boat	*Fannie*	1852	
Point Arena	Schooner	*Charles and Edward*	1858	
Point Arena	Sloop–Sealer	*Jack Hays*	1858	
Point Arena	Schooner	*Don Leandro*	1861	
Point Arena	Schooner	*Rosalie*	1862	
Point Arena	Ship	*E. Bulkley*	1864	
Point Arena	Schooner	*Helen*	1865	
Point Arena	Schooner	*Amazone or Amazon*	1869	
Point Arena	Schooner	*B. F. Lee**	1870	1870
Point Arena	Schooner	*Emilie Schroeder**	1871	8637
Point Arena	Schooner	*Elsie Iverson*	1872	
Point Arena	Schooner	*Annie M. Iverson*	1873	105146
Point Arena	Schooner	*Annie*	1874	
Point Arena	Schooner	*Sine Johnson**	1874	23136
Point Arena	Brig	*Curlew**	1875	5133
Point Arena	Schooner	*Barbara Fritchie**	1880	
Point Arena	Schooner	*Zulu*	1880	
Point Arena	Schooner	*Robert and Minnie**	1880	110289
Point Arena	Schooner	*Alviso*	1883	
Point Arena	Schooner	*Reliance*	1885	110965
Point Arena	Schooner	*Elsie Iverson*	1886	135840
Point Arena	Schooner	*Fannie A. Hyde*	1886	9948
Point Arena	Schooner	*Albert Walker**	1888	106532
Point Arena	Steam Schooner	*Prentiss**	1905	150938
Point Arena	Steam Schooner	*Shna-Yak**	1908	204509
Point Arena	Steam Schooner	*G. C. Lindauer**	1912	39775
Point Arena	Steam Schooner	*Fort Bragg**	1912	207985
Point Arena	Auxiliary Schooner	*Dunkerque*	1918	
Point Arena	Tug	*Nata*	1918	
Point Arena	Gasoline Schooner	*Mae Hyman**	1921	220460
Point Arena		*H. F. Harper*	1922	
Point Arena		*Escola*	1926	
Point Arena	Steam Schooner	*Svea**	1928	203192
Point Arena		*Vanguard*	1930	

Table 4.5-1. Known Shipwrecks and Lost Aircraft within Study Area

Location	Type	Name	Year Lost	Official No.
Point Arena	Tanker	*Lebec**	1937	221358
Point Arena	Freighter	***Pacific Enterprise***	1949	149949
Point Arena	Schooner	*C. W. Gunnel*	1862	
Point Arena	Schooner	*Venus**	1875	25893
Point Arena	Schooner	*Barbara Hernster**	1901	3372
Point Arena Cove	Schooner	*Ajax*	1869	1190
Point Arena Cove	Schooner	*General Ord*	1889	85053
Point Arena Cove	Scow Schr Barge	*Horace Templeton*	1920	95249
Point Arena Cove	Gas Screw–Freight	*Cuautemoc*	1924	223010
Point Arena Cove, just south of	Steam Schooner	***Noyo***	1935	211426
Point Arena Cove, south side reef	Steam Schooner	***West Coast***	1891	81085
Point Arena Harbor	Schooner	*S. F. Blunt*	1868	
Point Arena Light, 1.5 miles north of	Fishing Vessel	*Georgene M.*	1953	250179
Point Arena Light, 4 miles, 035 deg true	Fishing Vessel	*Star of the Sea*	1961	230081
Point Arena Lighthouse, 1/4 mile northwest	Pass Cargo Steamer	***Winnebago***	1909	81871
Point Arena Lighthouse, north side	Schooner	*James Townsend*	1895	13832
Point Arena Lighthouse, off	Pass Cargo Steamer	*Phoenix**	1910	150929
Point Arena Reef	Bark	*Hyack*	1863	
Point Arena, 15 miles off	U.S. Military Aircraft	Helldiver	1944	18740
Point Arena, 15 miles south	U.S. Military Aircraft	Hellcat	1944	42172
Point Arena, 20 miles off	Purse Seiner	*Nordic Pride*	1941	241040
Point Arena, 25 miles southeast of	Steam Schooner	*Noyo*	1918	130395
Point Arena, near	Steamship	*Charles Nelson**	1910	127253
Point Arena, near	Steamer	*Celilo**	1919	211948
Point Arena, north of	Brig	IL'MENA	1820	
Point Arena, North–Manchester Beach	Steamer	***San Benito***	1896	116342
Point Arena, north side of lighthouse	Pass Cargo Steamer	*Eastport*	1875	8884
Point Arena, off	Steam Schooner	*Daisy Putnam**	1919	211722
Point Arena, south of lighthouse	Steam Schooner	*Jeanie**	1900	76889
Point Arena, south reef	Passenger Steamer	*Sea Foam*	1931	201861
Point Arena, south side	Steam Schooner	*Point Arena**	1904	150402
Point Arena, south side of harbor	Schooner	*Golden Gate**	1889	85314
Point Arena, Wash Rock	Schooner	*Eliza Miller**	1880	
Point Arena, Wash Rock	Steam Schooner	*Del Norte**	1917	157295
Russian Gulch	Auxiliary Schooner	*Stockton City*	1922	81613
Russian Gulch, Sonoma	Schooner	*Hannah Louise*	1872	11673
Russian Gulch, Sonoma	Steam Schooner	*Maggie Ross*	1892	92037
Russian Landing	Schooner	*D. C. Haskins*	1885	6643
Russian River	Schooner	*Eagle*	1863	
Russian River	Schooner	*Far West**	1863	
Russian River	Schooner	*Maggie Young*	1889	91200
Russian River	Schooner	*C. T. Hill**	1889	126539
Russian River, 280 DGR, 15 miles off	U.S. Military Aircraft	Avenger	1945	45839

Table 4.5-1. Known Shipwrecks and Lost Aircraft within Study Area

Location	Type	Name	Year Lost	Official No.
Russian River, 2 miles below mouth	Schooner	*Ann Sophia*	1870	1183
Salmon Creek	Schooner	*Albert and Edward*	1877	105592
Salt Point	Schooner	*Mary Zephyr**	1866	
Salt Point	Schooner	*Mary D. Pomeroy*	1879	91162 or 02
Salt Point	Schooner	*Phantom*	1881	150163
Salt Point, 4 miles northwest	Brig	*Ellen H. Wood*	1859	
Salt Point, Gerstle Cove	Schooner	*Nautilus*	1877	18595
Salt Point, near	Schooner	*Bianca*	1861	
Salt Point, near		*Erial*	1889	
Saunder's Reef	Schooner	*Jaqua*	1888	
Saunder's Reef, foundered off Fish Rock	Steam Schooner	***Arctic***	1922	107640
Saunders Reef	Steam Screw	*Ferndale**	1883	120434
Saunders Reef	Steamer	*Iaqua**	1913	100715
Saunders Reef	Oil Tanker	***Whittier***	1922	81862
Signal Port (Hard Scratch & Steen's)	Schooner	*R. B. Handy*	1883	110290
Stewarts Point	Schooner	*Christina Steffens**	1888	125500
Stewarts Point	Schooner	*Portia*	1894	150443
Stewarts Point	Steamer	***Albion***	1913	106967
Stewarts Point	Freighter	*Kenkoku Maru**	1951	52855
Stewarts Point	Schooner	*Pet*	1866	
Stewarts Point	Schooner	*Huichica**	1871	11680
Stewarts Point	Schooner	*Minerva*	1871	
Stewarts Point	Schooner	*Pinol*	1873	20090
Stewarts Point	Schooner	*Matilda Heron*	1875	17407
Stewarts Point	Schooner	*D. W. Tietjen*	1878	6532
Stewarts Point	Schooner	*Charles T. Winslow*	1885	5156
Stewarts Point	Schooner	*Mary Etta*	1905	92284
Stewarts Point	Schooner	*Fannie A. Hyde**	1871	9948
Stewarts Point	Schooner	*Kate Piper*	1871	14202
Stewarts Point	Schooner	*Lizzie Derby**	1871	1871
Stewarts Point	Schooner	*George Henrich*	1871	85027
Stewarts Point, Fisherman's Bay	Schooner	*Susie*	1876	115098
Stewarts Point, Fisherman's Bay	Steamer	*Wild Pigeon*	1870	26787
Stewarts Point, Fishermans Bay	Schooner	*Abraham Lincoln*	1881	1180
Stewarts Point, 6 miles southwest	Schooner	*J. Mora Moss*	1874	13559
Stewarts Point	Schooner	*Jennie Reed*	1861	
Timber Cove	Schooner	*Liberty*	1872	15207
Timber Cove	Schooner	*Golden Rule*	1882	10731
Timber Cove	Steamer–Screw	*Acme*	1889	106607
Timber Cove	Schooner	*Ester Cobos*	1891	135342
Timber Cove (Windermere Point)	Bark	***Windermere***	1883	78765
Timber Cove, Fish Creek	Schooner	*Christina Steffens**	1880	125500

Source: ONMS 2013.
*Indicates vessel refloated, salvaged or not a total loss. Vessel names in bold have been located.

4.5.2 Regulatory Overview

Cultural and historical resources are regulated through numerous federal and State laws, as summarized below. Depending on the resources identified, the following authorities could apply within the study area.

Federal Regulations

National Historic Preservation Act of 1966, 16 U.S.C. §§ 470-470x-6

Cultural and historical resources on state and federal lands are protected primarily through the National Historic Preservation Act (NHPA) (16 U.S.C. § 470 et seq.) of 1966 and its implementing regulations (found at 36 CFR Part 800). Section 106 of the NHPA requires federal agencies to identify and evaluate the effects of their actions on properties listed in or eligible for listing in the National Register of Historic Places (NRHP). Consultation with the State Historic Preservation Officer (SHPO), Native American tribes Tribal Preservation Officer (THPO), the Advisory Council for Historic Preservation, and other interested parties is part of the regulatory process. The intent of the process is to require the federal agency, in consultation with other affected parties, to make an informed decision as to the effect its actions would have on something that may be important to our heritage. To be protected under the NHPA, a property must meet specific criteria of significance established under the NHPA's regulations at 36 CFR Part 60.

According to NHPA (§ 36 CFR PART 800), the agency official shall apply the National Register criteria (36 CFR part 63) to properties identified within the area of potential effects that have not been previously evaluated for National Register eligibility, in consultation with the SHPO/THPO and any Indian tribe that attaches religious and cultural significance to identified properties and guided by the Secretary's Standards and Guidelines for Evaluation. The passage of time, changing perceptions of significance, or incomplete prior evaluations may require the agency official to reevaluate properties previously determined eligible or ineligible. The agency official shall acknowledge that Indian tribes possess special expertise in assessing the eligibility of historic properties that may possess religious and cultural significance to them.

Regarding assessment of adverse effects, NHPA (§ 800.5) states that the agency official shall apply criteria of adverse effects to historic properties within the area of potential effects, in consultation with the state preservation officer/tribal historic preservation officer and any Indian tribe that attaches religious and cultural significance to identified historic properties. The agency official shall consider any views concerning such effects which have been provided by consulting parties and the public.

Archaeological Resources Protection Act of 1979, 16 U.S.C. §§ 470aa–470mm

This act requires all archaeological excavations on federal lands to be undertaken pursuant to a permit issued by the federal land manager. This act also imposes criminal penalties for unauthorized excavations.

Native American Graves Protection and Repatriation Act of 1990, 25 U.S.C. §§ 3001-3013

This act requires federal agencies to identify and inventory possible Native American, native Alaskan, or native Hawaiian human remains, burial goods, or cultural items in their collections and to make them available for repatriation to affiliated tribes or lineal descendants. The act also establishes procedures for handling and disposing of such remains, burial goods, or cultural items discovered on federal lands.

Executive Order 13175: Tribal Consultation and Collaboration

Under Executive Order 13175 of November 6, 2000, federal departments and agencies are charged with engaging in regular and meaningful consultation and collaboration with tribal officials in the development of federal policies that have tribal implications, and are responsible for strengthening the government-to-government relationship between the United States and Indian tribes. Representatives from the Manchester Band of Pomo Indians, Kashia Band of Pomo Indians of Stewarts Point Rancheria, and Federated Indians of Graton Rancheria were invited in writing to consult with NOAA under Executive Order 13175. As of publication date of this document, NOAA has not received responses to the consultation letters. However, NOAA will continue to seek their participation in the development of this rulemaking.

Abandoned Shipwreck Act of 1987, 43 U.S.C. §§ 2101-2106

This act asserts federal ownership over certain shipwrecks found in State waters (within the 3-nm line) and transfers ownership of those resources to the states. Included in the range of resources covered by this act are certain abandoned shipwrecks, which have been deserted and to which the owner has relinquished ownership rights with no retention. Shipwrecks in federal waters remain under the jurisdiction of the federal government.

Sunken Military Craft Act of 2005, 10 U.S.C. §§ 13

This act asserts federal ownership over sunken military craft. No person shall engage in or attempt to engage in any activity directed at a sunken military craft that disturbs, removes, or injures any sunken military craft, except — (1) as authorized by a permit under this title; (2) as authorized by regulations issued under this title; or (3) as otherwise authorized by law.

Antiquities Act of 1906, 16 U.S.C. §§ 431-433

This act requires a permit to excavate or remove any historic objects or antiquities from federal lands, and grants the President the authority to designate as national monuments landmarks of historic or scientific importance. The permit provisions of the Antiquities Act are generally enforced through the NHPA process.

Historic Sites, Buildings, Objects, and Antiquities Act of 1935, 16 U.S.C. §§ 461-467

This act establishes the national policy of preserving historic resources and gives the Secretary of the Interior the power to make historic surveys and document, evaluate, acquire, and preserve archaeological and historic sites across the country. This act provided the authority behind the establishment of the National Historic Landmarks and Historic American Buildings Survey programs.

State Regulations

Administration and Control of State Lands, California Public Resources Code§§ 6301-6614

The referenced section of the California Public Resources Code provides authority for the California State Lands Commission (CSLC or commission) to administer and control State lands. Excerpts from the California Code of Regulations that relate to the CSLC's regulation of submerged archaeological and historical resources are below.

California Code of Regulations, Title 2 Administration

The California State Lands Commission prohibits disturbance of submerged archaeological and historical resources, except by permit in the study area from the mean high tide line to 3 nm offshore. Under Title 2, the commission has exclusive jurisdiction over all ungranted tidelands and submerged lands owned by the State, and of the beds of navigable rivers, streams, lakes, bays, estuaries, inlets, and straits, including tidelands and submerged lands or any interest therein, whether within or beyond the boundaries of the State as established by law, which have been or may be acquired by the State (a) by quitclaim, cession, grant, contract, or otherwise from the United States or any agency thereof, or (b) by any other means. All jurisdiction and authority remaining in the State as to tidelands and submerged lands as to which grants have been or may be made is vested in the commission. The commission shall exclusively administer and control all such lands, and may lease or otherwise dispose of such lands, as provided by law, upon such terms and for such consideration, if any, as are determined by it. Relevant excerpts of the regulation include the following:

> *§§ 6309. (a) The commission shall administer the Shipwreck and Historic Maritime Resources Program, which consists of the activities of the commission pursuant to this section and Sections §§6313 and §§6314.*
>
> *(b) The commission has exclusive jurisdiction with respect to salvage operations over and upon all tide and submerged lands of the state. The commission may grant the privilege of conducting salvage operations upon or over those lands by the issuance of permits. The commission may adopt rules and regulations in connection with applications for those permits, and the operations to be conducted in the salvage operation, that the commission determines to be necessary to protect those lands and the uses and purposes reserved to the people of the state.*
>
> *(c) The commission may issue permits for salvage on granted tide and submerged lands only after consultation with the grantee and a determination by the commission that the proposed salvage operation is not inconsistent with the purposes of the grant.*

Department of Parks and Recreation, California Public Resources Code §§ 5001-5019.5

The California Public Resources Code provides for California Department of Parks and Recreation's (California State Parks') control of the State park system, including management of submerged archaeological and historical resources within State park units.

The department may manage state marine reserves, state marine parks, state marine conservation areas, state marine cultural preservation areas, and state marine recreational management areas. Department authority over units within the State park system shall extend to units of the State Marine Managed Areas (MMAs) system that are managed by the department.

The California State Parks regulations are found in the California Code of Regulations, Title 14, Natural Resources, §§ 4300-4971. Several of the regulations pertain to historic or cultural resources.

California Code of Regulations, Title 14 Division 3

The Department of Parks and Recreation has broad authority under Title 14 to protect geological and archaeological features within designated State parks.

§ 4307. Geological Features.
(a) No person shall destroy, disturb, mutilate, or remove earth, sand, gravel, oil, minerals, rocks, paleontological features, or features of caves. (b) Rockhounding may be permitted as defined in Section 4301(v).

Note: Authority cited: Section 5003, Public Resources Code. Reference: Section 5008, Public Resources Code. This regulation is relevant because it addresses paleontological features.

§ 4308. Archaeological Features.
No person shall remove, injure, disfigure, deface, or destroy any object of archaeological or historical interest or value.

Note: Authority cited: Section 5003, Public Resources Code. Reference: Section 5008, Public Resources Code.

§ 4309. Special Permits.
The Department may grant a permit to remove, treat, disturb, or destroy plants or animals or geological, historical, archaeological or paleontological materials; and any person who has been properly granted such a permit shall to that extent not be liable for prosecution for violation of the foregoing.

Note: Authority cited: Section 5003, Public Resources Code. Reference: Sections 5001.65 and 5008, Public Resources Code.

Fish and Wildlife Protection and Conservation, California Fish and Game Code §§ 1600-1616

California Code of Regulations, Title 14 Division 1

The Fish and Game Commission has broad authority under Title 14 of the CCR to establish regulations that restrict unlawful injury, damage, taking, or possessing any geological, or cultural marine resource. Of particular relevance to this DEIS are the eleven existing Marine Protected Areas (MPAs) in the study area (Title 14, Section 632 – Marine Protected Areas, Marine Managed Areas and Special Closures). MPAs in the study area have been in effect since May 1, 2010, and some include submerged historic shipwrecks or other cultural or historic artifacts. They may also include cultural resources from Indian tribes. Regarding protection of cultural resources, Section 632 states, in part:

(A) State Marine Reserves: In a state marine reserve, it is unlawful to injure, damage, take, or possess any geological, or cultural marine resource, except under a scientific collecting permit issued pursuant to Section 650 or specific authorization from the commission for research, restoration, or monitoring purposes.

(B) State Marine Parks: In a state marine park, it is unlawful to injure, damage, take, or possess any living or nonliving marine resource for commercial purposes. Any human use that would compromise protection of geological, cultural features, may be restricted by the commission as specified in subsection 632(b), areas and special regulations for use. The commission may issue scientific collecting permits pursuant to Section 650 or specifically authorize research, monitoring, and educational activities consistent with protecting resource values.

(C) State Marine Conservation Areas: In a state marine conservation area, it is unlawful to injure, damage, take, or possess any geological, or cultural marine resource for commercial or recreational purposes, or a combination of commercial and recreational purposes except as specified in subsection 632(b), areas and special regulations for use. The commission may issue scientific collecting permits pursuant to Section 650 or specifically authorize research, education, and recreational activities, provided that these uses do not compromise protection of the species of interest, natural community, habitat, or geological features.

See Section 4.3 (Biological Resources) for additional information on MPAs.

4.5.3 Impact Assessment Methodology

Cultural resources must meet certain federal criteria to be considered a significant historic resource. The following significance criteria are the basis for determining inclusion of a property on the NRHP (36 CFR 60.4). The property must have or be the following:

- Association with events that have made a significant contribution to the broad patterns of our history;
- Association with the lives of persons significant to our past;
- Resources that embody the distinctive characteristics of a type, period, or method of construction or that represent the work of a master or that possess high artistic values or that represent a significant and distinguishable entity whose component may lack individual distinction; or
- Resources that have yielded, or may be likely to yield, information important in prehistory or history.

Pursuant to the NHPA and its implementing regulations, an undertaking has an effect on a historic property when it alters those characteristics of the property that qualify it for inclusion in the NRHP. An undertaking is considered to have an adverse effect on a historic property when it diminishes the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Adverse effects include, but are not limited to, the following:

- Physical destruction, damage, or alteration of all or part of the property;
- Isolation of the property or alteration of the character of the property's setting when that character contributes to the property's qualifications for the NRHP;
- Introduction of visual, audible, or atmospheric elements that are out of character with the property or changes that alter its setting;
- Neglect of a property resulting in its deterioration or destruction; and
- Transfer, lease, or sale of a property without adequate provision to protect the property's historic integrity.

The proposed action would have a significant adverse effect on a historic property if its implementation would alter those characteristics of the property that qualify it for inclusion on the NRHP, per 36 CFR PART 800 (see the reference to this part of the CFR where NHPA is described in Section 4.5.2, Regula-

tory Overview). In addition, an action that may alter any characteristic of a historic property or resource determined by a Native American tribe to be of traditional religious and cultural significance to the tribe would be considered to have a significant effect on that resource. Effects may include changes to a historic property or its setting or to a resource or its setting.

4.5.4 Environmental Consequences

It is important to note that sunken vessels may contain hazardous cargo, abandoned fuel, and unexploded ordnance. These sunken vessels are slowly deteriorating in a corrosive marine environment. For instance, shipwrecks of concern that should be assessed are the British motor-ship *Pacific Enterprise* a 436-foot steel hull freighter lost off Point Arena in 1949, and the steamer *Dorothy Wintermote*, a 252-foot steel hull freighter lost off Gualala Point in 1938.

Proposed Action

The proposed action would have a beneficial effect on historical resources because it would prohibit drilling, dredging, or altering, constructing, placing, or abandoning any structure material or matter on or in the submerged lands within the proposed expansion area. Any of these activities could potentially disturb, injure, or damage submerged historical resources. Currently GFNMS has regulations in place to protect submerged historical resources. The proposed action includes adding a regulation for CBNMS to protect historical resources, which would prohibit the possession, moving, removing, injuring, or attempting to possess, move, remove or injure a sanctuary historical resource. Although both sanctuaries will have a new regulation to authorize some otherwise prohibited activities such as seabed alteration, the sanctuary superintendent has authority to impose conditions on the activity to protect sanctuary resources and must agree to such authorization. With these provisions in place, any potential adverse impacts on historical resources would be negligible.

The National Marine Sanctuaries Act (NMSA) mandates the management and protection of submerged archaeological sites within sanctuary boundaries. Therefore, the ONMS has conducted research to identify submerged heritage resources in the study area and completed an inventory and implemented a Section 106 Review under the NHPA (as described in Section 4.5.2). NOAA preservation mandates for maritime archaeological resources derive directly from elements of the Federal Archaeology Program, including the NHPA. Section 110 of the NHPA states that each federal agency shall establish a preservation program for the protection of historic properties. The laws described in Section 4.5.2 codify the protection of heritage sites from illegal salvage and looting. NOAA jurisdictional authority would be applicable to the study area causing no adverse effect on archaeological properties.

No Action Alternative

The No Action alternative would be to continue to manage the submerged bottom lands by the California State Lands Commission, California Department of Parks and Recreation, and California Department of Fish and Wildlife (within their jurisdictions) with no concurrent jurisdiction under the National Marine Sanctuaries Act. The California State Lands Commission (CSLC) has jurisdiction over the State's tide and submerged lands within 3 nm of the mean high tide line along the coastline and offshore islands.

Depending on the resources identified, other laws could also apply; see Section 4.5.2 (Regulatory Overview). However, activities currently allowed, such as drilling or otherwise altering the seabed, could disturb submerged cultural resources. The above-referenced State protections would not apply in federal waters. While there are federal laws regarding shipwrecks and other cultural resources, the additional beneficial effects afforded by national marine sanctuary status, as described for the proposed action, would not occur under the No Action alternative.

Existing Regulations Alternative

Applying the current regulations to the proposed expansion area would result in beneficial impacts on historical resources, from the prohibition of drilling, dredging, or altering, constructing, placing, or abandoning any structure material or matter on or in the submerged lands. This beneficial impact would be the same as described for the proposed action. Although there would be a specific regulation in GFNMS regarding the prohibition of disturbance of historical resources, no such regulation would be in place for CBNMS (because it is not part of the existing regulations) under this alternative, so the protections offered would not be as comprehensive as described for the proposed action. As noted in Section 4.5.2, there are several existing laws that provide some degree of protection of historical resources, but State regulations only extend 3 nm offshore. However, this alternative would not include the authorization process for either CBNMS or GFNMS, so there would be no provision to allow activities that may alter or disturb the seabed. Without this provision, there would be little chance of uses or activities occurring that would disturb historical resources. The overall effect would be beneficial, compared to existing conditions.

Arena Cove Boundary Alternative

This alternative would have a beneficial effect on cultural resources because this would prohibit drilling, dredging, or altering, constructing, placing, or abandoning any structure material or matter on or in the submerged lands within the larger sanctuary area that includes all of Arena Cove. Any of these activities could potentially disturb, injure, or damage submerged and cultural resources. Historic shipwrecks have been reported in Arena Cove and submerged historic remains associated with the pier structure and spilled cargos may exist. Southeast of the pier and close to shore is a steam boiler associated with the wrecking event of the steamer *Sea Foam* lost in 1931. The boiler is still visible above the waterline during a low tide.

MPWC Zones Alternative

The slight changes in the designated MPWC use zones would not change the impact conclusions of either the proposed action or existing regulations alternative. There would be no difference in potential impacts on historical resources from this alternative.

4.6 Socioeconomic Resources, Human Uses and Environmental Justice

This section includes analysis of the following resource issue areas: social and economic activities and uses: recreation and tourism (including public access), land use and development, research and education, and passive economic use. The study area or potential affected environment varies, by issue area and is defined for each subsection in Section 4.6.1 (Regional Overview of Affected Environment).

Please note that impacts on commercial fishing, offshore energy, marine transportation and homeland security and military uses are addressed in Sections 4.4, 4.7, 4.9 and 4.10, respectively. Also note that a separate benefits-costs analysis is provided in Chapter 11 (Comparison of Alternatives). That analysis is, in part, based on information in this section.

4.6.1 Regional Overview of Affected Environment

Socioeconomics

For the socioeconomic issue area, the study area is comprised of seven counties where the majority of social and economic activities associated with resource uses in the boundary expansion area take place. The counties include Alameda, Contra Costa, Marin, Mendocino, San Francisco, San Mateo, and Sonoma (Figure 4.6-1). Data for the state of California and, in some cases, the U.S. are presented for comparison and analysis of possible broader effects of proposed actions. Data for Mendocino and Sonoma Counties, the two coastal counties adjacent to the boundary expansion, are also presented. Socioeconomic issues include population growth, employment, income and environmental justice.

This section also addresses business uses of the boundary expansion areas. Tourist/recreational businesses (e.g., lodging, restaurants) and uses (e.g. whale watching, kayaking, SCUBA diving, bird or other wildlife watching, recreational fishing) are prominent along Highway 1.

Socioeconomic Profile Definition

The socioeconomic profile provides the basis of analyses to establish local communities/economies dependence on study area resources. A standard profile includes information on population, demographics (e.g. sex, race/ethnicity, and age), population density, poverty rate, labor force, unemployment rate, income by place of work/industry, employment by industry, income by place of residence, and per capita income. The combined information describes the region's socioeconomic health.

Population and Key Measurements on the Economic Status of the Study Area

When assessing the condition of sanctuary resources, population is a key driver behind the pressures placed on sanctuary resources, but many in the population are also beneficiaries of the ecosystem services generated from sanctuary resources. For some key measures of economic status of the study area, per capita income, poverty rates, and unemployment rates are provided as key indicators in this section. The study area is compared to the U.S., California (CA) and Mendocino and Sonoma Counties for status and trends in selected measures (Table 4.6-1).

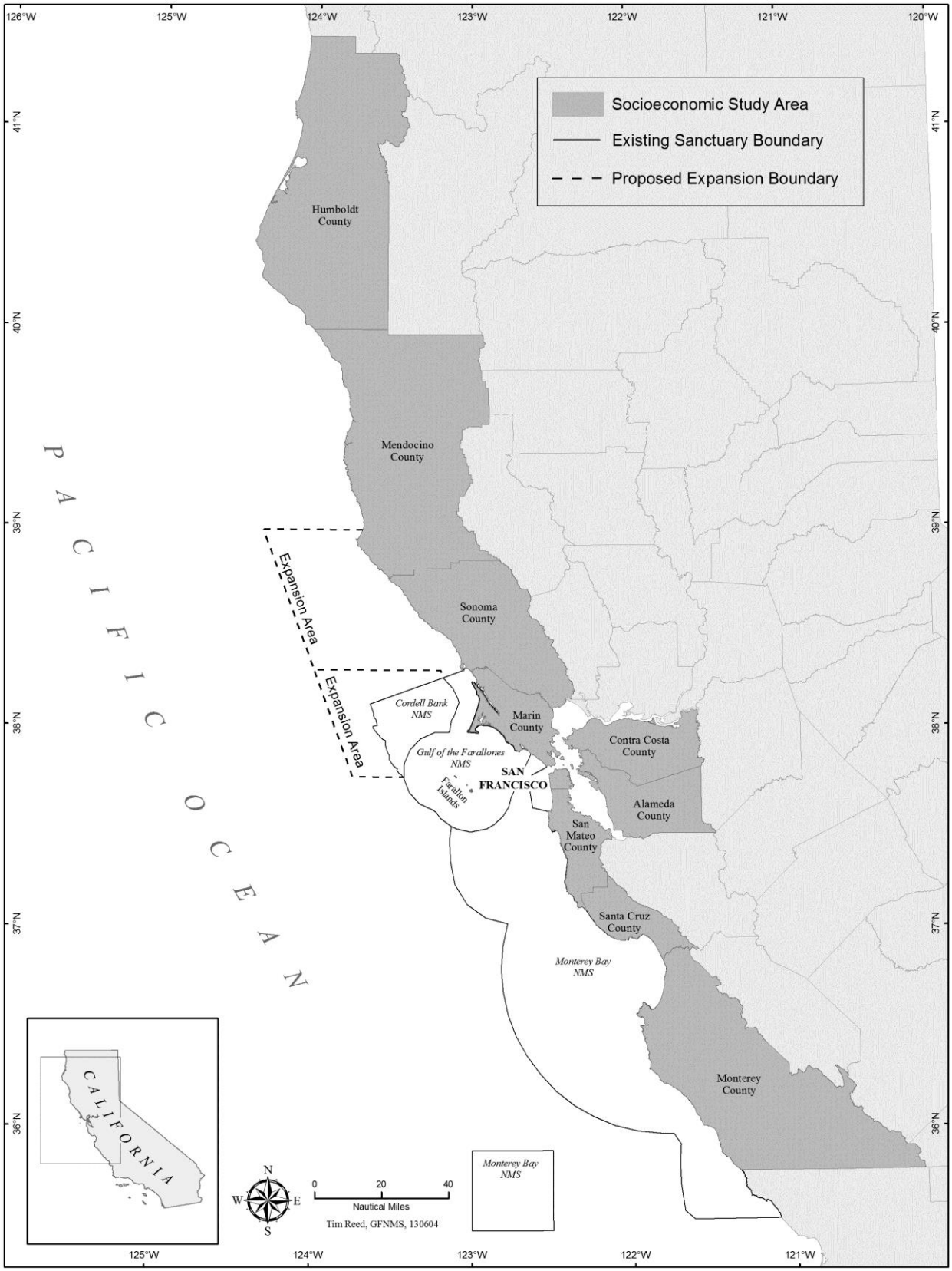

Figure 4.6-1. Counties Included in the Study Area

Table 4.6-1. Selected Socioeconomic Measures for Description of the Study Area

County	2010 Population	Population Change (%) 2000-2010	2010 Population Density[1]	2010 Per Capita Income ($)	2010 Persons Below Poverty (%)	2010 Unemployment Rate (%)
Alameda	1,510,271	4.61	2,044	47,603	10.95	11.3
Contra Costa	1,049,025	10.56	1,465	54,817	8.69	11.1
Marin	252,409	2.07	485	82,498	6.65	8.0
Mendocino	87,841	1.83	25	34,733	16.75	11.3
San Francisco	805,235	3.67	17,169	69,351	11.50	9.6
San Mateo	718,451	1.60	1,602	66,629	6.78	8.8
Sonoma, CA	483,878	5.51	307	43,274	9.92	10.5
Mendocino & Sonoma	**571,719**	**4.93**	**112**	**42,023**	**10.97**	**10.6**
Study Area Total	**4,907,110**	**4.86**	**650**	**56,735**	**10.03**	**10.3**
California	**37,253,956**	**9.99**	**239**	**41,893**	**13.21**	**12.4**
U.S.	**308,745,538**	**9.71**	**87**	**39,791**	**13.25**	**9.6**

1. Number of people per square mile.
Sources: U.S. Department of Commerce, Bureau of the Census and the Bureau of Economic Analyis, Regional Economic Information System

Population. The study area population covers seven California counties with a population of over 4.9 million in 2010, which is approximately 13% of California's total population. The three most populous counties in the study area include Alameda with 1.51 million, Contra Costa with 1.05 million, and San Francisco with 805,000 (Table 4.6-1).

Population Growth. For each 10-year period from 1970 to 2010, the study area's population grew at a slower rate than the state of California. Compared to the U.S., the study area grew at a slower rate in all 10-year periods, except 1980 to 1990. Mendocino and Sonoma Counties grew at a rate faster than the U.S, California and the study area for all 10-year periods except 2000 to 2010. (Table 4.6-2).

Projected Population Growth. The study area's population is projected to grow at higher rates than the 2000 to 2010 period for the period from 2010 to 2020. The study area's population is projected to grow at a slower rate from 2020 to 2040 relative to the 2000 to 2010 period. Mendocino and Sonoma Counties' rates of population growth are projected to exceed that of the study area for the period from 2010 to 2040 (Woods and Poole 2011) (Table 4.6-2).

Population Density. Population density is an indicator of the extent of pressures that the study area's population might have on sanctuary resources. Population density varies widely across the study area counties ranging from a high of 17,169 people per square mile in San Francisco County to a low of 25 people per square mile in Mendocino County (Table 4.6-1).

Table 4.6-2. Population Growth and Projected Growth

Measurement/Time Period	US	California	Study Area	Mendocino & Sonoma
Population Growth (%)				
1970 to 1980	11.59	18.59	7.47	42.99
1980 to 1990	9.81	25.74	14.88	28.01
1990 to 2000	13.09	13.82	12.36	16.29
2000 to 2010	9.53	9.99	5.1	4.93
Population Projections (%)[1]				
2010 to 2020	--	--	5.21	8.44
2020 to 2030	--	--	5.02	7.97
2030 to 2040	--	--	4.64	7.32

1. Woods and Poole would not authorize NOAA to report US and California projections.
Sources: U.S. Department of Commerce, Bureau of the Census and Woods and Poole.

Per Capita Income. Per capita income is an indicator of the health or economic status of a community. In 2010, per capita income in the study area was $56,735 and ranged from a low of $34,733 in Mendocino County to a high of $82,498 in Marin County. In 2010, per capita income in the study area exceeded that of the U.S., California and Mendocino and Sonoma Counties (Table 4.6-1) despite declines in real per capita income leading up to 2010. Real per capita income grew faster in the study area relative to the U.S., California and Mendocino and Sonoma Counties for the period 1990-2000, but declined in both periods from 2000 to 2010, while increasing in the U.S. Real per capita income in Mendocino and Sonoma Counties grew at a rate faster than the U.S and California, but slower than the study area for the period 1990 to 2000. For the period 2000 to 2010 Mendocino and Sonoma Counties declined at a rate faster than the U.S and California, but slower than the study area in 2000 to 2005 (Table 4.6-3 and Figure 4.6-2).

Unemployment Rates. Another indicator of the economic health of the study area is the unemployment rate. In 2010, the unemployment rate was 10.3% in the study area and ranged from a low of 8.0% in Marin County to a high of 11.3% in Mendocino and Alameda Counties. In 2010, the study area's unemployment rate was higher than the U.S., but lower than that for California and Mendocino and Sonoma Counties (Table 4.6-1). Unemployment rates were lower in the study area than in the U.S., the state and Mendocino and Sonoma Counties for the periods 1990 to 2000. Unemployment rates were lower in the study area than in the U.S. and state, but higher than Mendocino and Sonoma Counties in 2005. In 2010, the study area's unemployment rate was higher than the U.S., but lower than in California and Mendocino and Sonoma Counties (Table 4.6-3).

Table 4.6-3. Unemployment Rates and Per Capita Personal Income

Measurement/Year	US	California	Study Area	Mendocino & Sonoma
Unemployment Rate (%)				
1990	5.6	5.8	3.7	4.5
2000	4.0	4.9	3.4	3.7
2005	5.1	5.4	4.8	4.6
2010	9.6	12.4	10.3	10.6
Per Capita Income				
1990	$19,354	$21,380	$26,308	$21,257
2000	$30,319	$33,404	$48,192	$35,967
2005	$35,452	$38,731	$53,116	$39,995
2010	$39,791	$41,893	$56,735	$42,023
Per Capita Income (2013$)				
1990	$34,100	$37,669	$46,351	$37,453
2000	$40,545	$44,671	$64,446	$48,098
2005	$41,802	$45,668	$62,629	$47,159
2010	$42,022	$44,241	$59,915	$44,379

Sources: U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Information System and U.S. Department of Labor, Bureau of Labor Statistics, Consumer Price Index

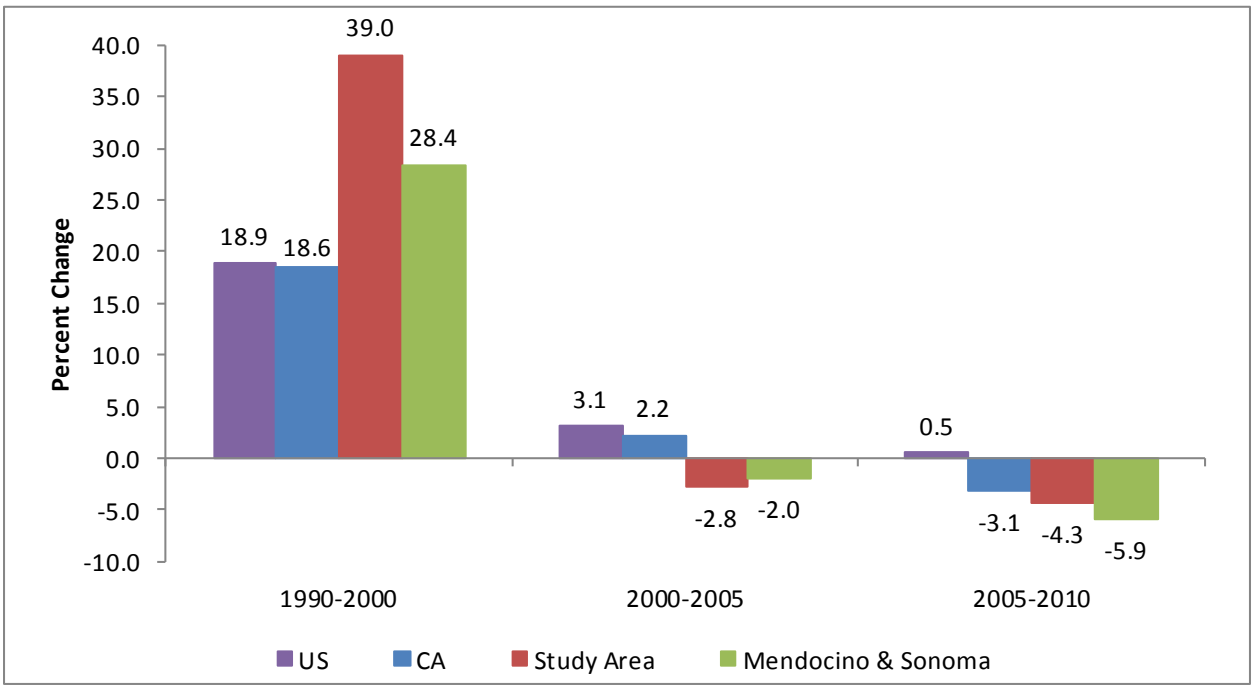

Figure 4.6-2. Changes in Real Per Capita Income in the Study Area versus the U.S., California and Mendocino and Sonoma Counties

Demographic Profiles

For demographic profiles, gender, race/ethnicity and age were chosen as the most important population characteristics to help understand the makeup of the study area. Race and Ethnicity are treated separately in the Census of the U.S. Racial categories include "White," "Black or African American," "Asian," "Alaskan Native or Native American," "Native Hawaiian or Other Pacific Islander" and "Multiple Races." We reduced the categories reported here by combining "Alaskan Native or Native American," "Native Hawaiian or Other Pacific Islander" and "Multiple Races" into the "Other" category for race. Hispanic represents ethnicity and in the Census is recorded separately from race with any race being eligible for being Hispanic. In the Census, Hispanic is "Hispanic, Latino or of Spanish Origin."

Gender. Gender distribution was relatively constant in the study area and Mendocino and Sonoma Counties from 1990 to 2010. The proportion of males in the study area and Mendocino and Sonoma Counties was higher than the U.S. from 1990 to 2010, but lower than that of California (Figure 4.6-3).

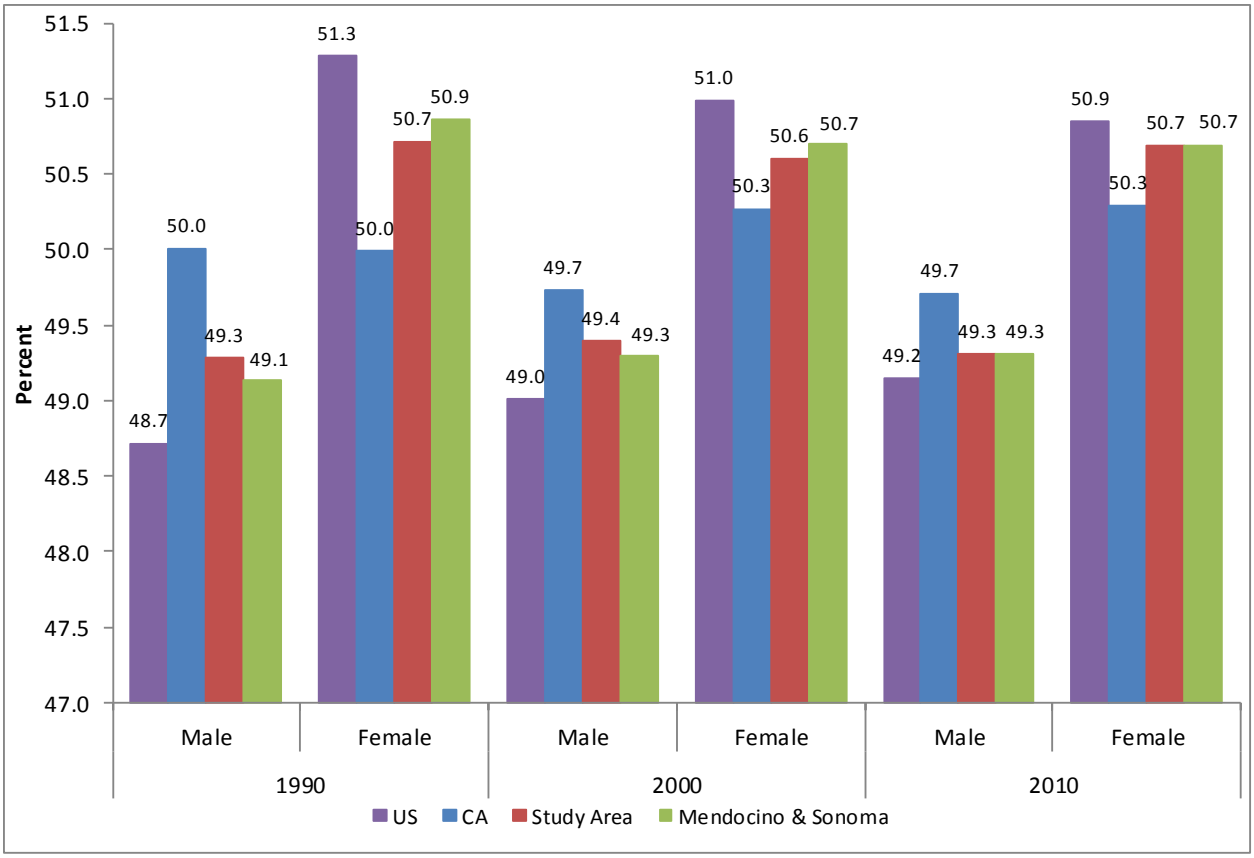

Figure 4.6-3. Gender Distributions in the Study Area versus the U.S., California, and Mendocino and Sonoma Counties, 1990, 2000 and 2010

Race/Ethnicity. Figure 4.6-4 illustrates current (year 2010) ethnicity percentages within the study area, compared to the U.S., state and Mendocino and Sonoma Counties. The changes in ethnicity over the past 20 years are shown in Figure 4.6-5.

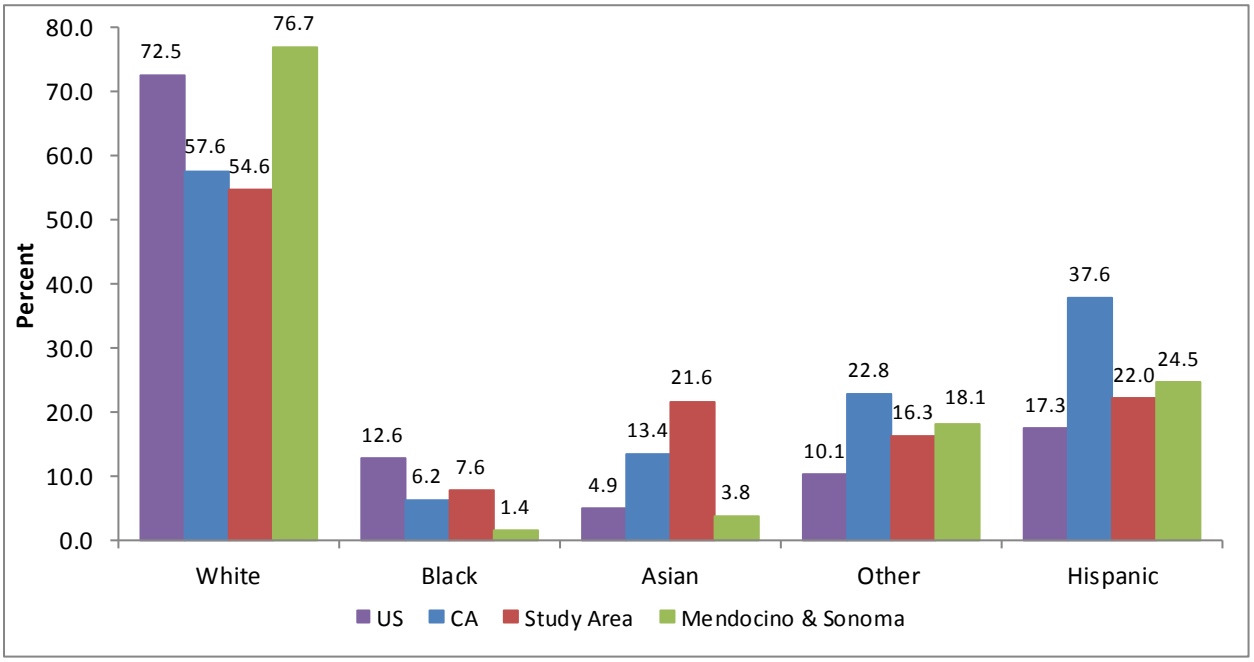

Figure 4.6-4. Race/Ethnicity in the Study Area versus the U.S., California and Mendocino and Sonoma Counties, 2010

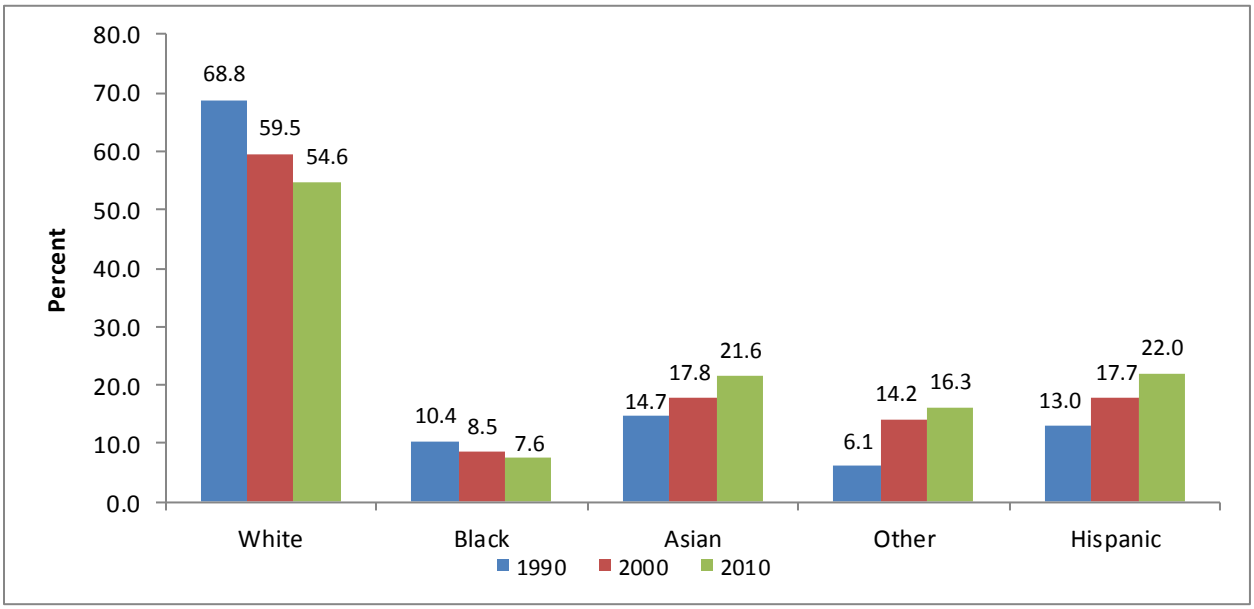

Figure 4.6-5. Race/Ethnicity in the Study Area, 1990, 2000 and 2010

Several indicators are used to identify the extent of minority communities and the economic status of the counties in the study area. In Table 4.6-1, poverty rates, unemployment rates and per capita income were presented by county as economic indicators of the economic status of the study area. In Figure 4.6-5, the distribution of race/ethnicity was presented for the entire study area. Table 4.6-4 provides the distribution by county.

Table 4.6-4. Race/Ethnicity by County in CB-GF Expansion Area, 2011

County	White	Black or African American	American Indian and Alaskan Native	Asian	Native Hawaiin and Other Pacific Islander	Two or More Races	Hispanic
Alameda	52.8	13.0	1.2	27.0	1.0	5.1	22.8
Contra Costa	68.8	9.7	1.0	15.2	0.6	4.8	24.8
Marin	86.2	3.0	1.2	5.8	0.3	3.5	15.7
Medocino	87.1	1.0	6.1	1.9	0.2	3.7	22.9
San Francisco	54.5	6.3	0.9	33.9	0.5	4.0	15.4
San Mateo	64.4	3.2	0.9	25.8	1.6	4.1	25.6
Sonoma	87.9	1.9	2.2	4.1	0.4	3.6	25.4

Source: U.S. Department of Commerce, Burea of the Census, Quick Facts.

The categories of race/ethnicity are more detailed in Table 4.6-4 than summarized in Figure 4.6-5 to focus more on minority populations. American Indian and Alaskan Natives and Native Hawaiian and Other Pacific Islanders are two categories representing small minority populations, but vary widely by county. Mendocino County has the highest proportion of population classified as American Indian and Alaskan Native. San Mateo and Alameda Counties have the highest proportion of their populations classified as Native Hawaiian and Other Pacific Islander. Black or African American, Asian and Hispanic populations, often considered minority populations, vary widely across the counties in the study area.

Age. In 2010, the age distribution of the population of the study area was not significantly different from either the U.S. or California (Figure 4.6-6). The proportion of the population ages 20 to 44 declined in the study area from 1990 to 2010, while it increased for those ages 45 to 64 (Figure 4.6-7).

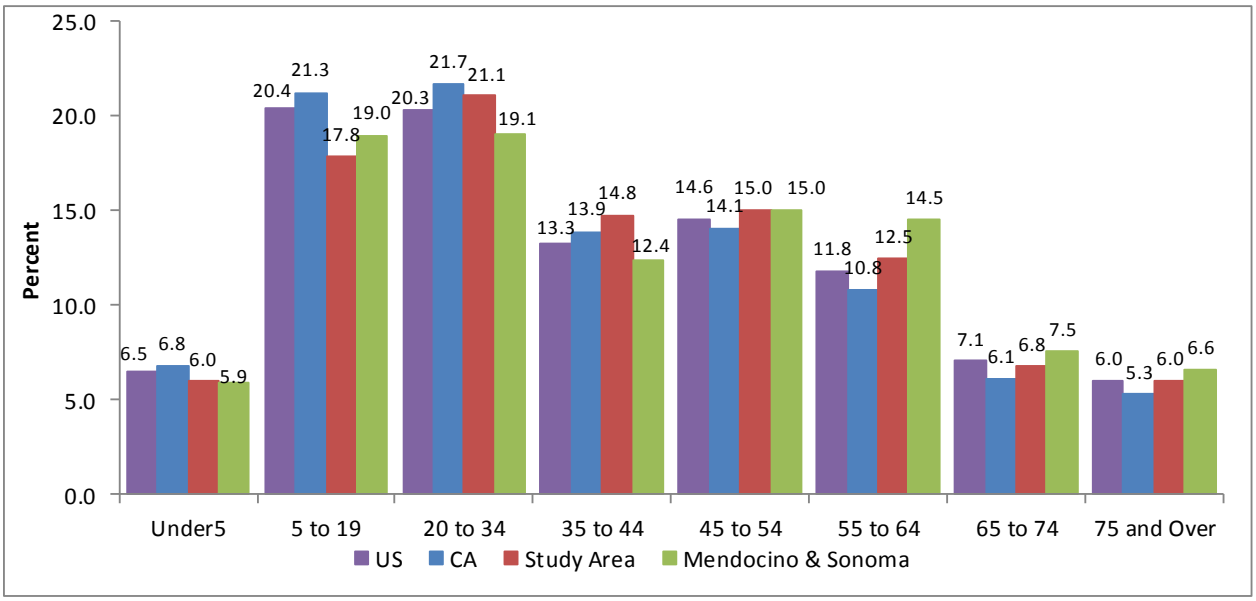

Figure 4.6-6. Age Distributions in the Study Area versus the U.S., California and Mendocino and Sonoma Counties, 2010

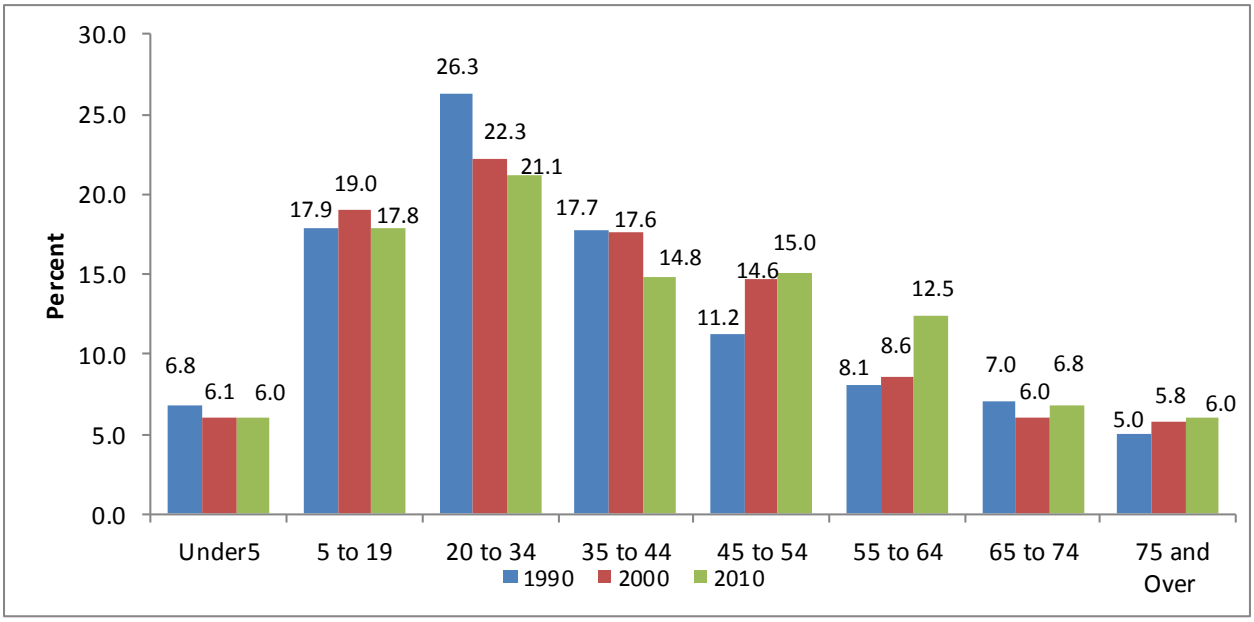

Figure 4.6-7. Age Distribution in the Study Area, 1990, 2000 and 2010

Economic Profile (Income and Employment)

In addition to evaluating the key indicators of the health of the economy using per capita income, poverty rates and unemployment rates, it is important to assess total personal income both generated within the study area (income by place of work) and what is received by residents in the study area (income by place of residence). The U.S. Department of Commerce, Bureau of Economic Analysis maintains the national income accounts on both these bases. People that live in a given area often receive income not derived by work in the area where they live. People receive pensions and social security payments. The unemployed receive unemployment compensation. Income-by-Place-of-Work as a percent of Income-by-Place-of-

Residence is usually a good indicator of an area having a significant retirement community. Sources of income not tied to the status of work in the local economy can provide more resilience to an economy making it less subject to the ups and downs of local work. The labor force and total employment and their growth rates are good indicators of a healthy or stagnant economy and opportunities for employment.

This section also includes information on proprietors' income and employment and the proportion of the study area's income and employment accounted for by proprietors of businesses. This is usually a good indicator of small businesses which are often connected to resource use in the sanctuaries (e.g. commercial fishing operations and recreation and tourist related businesses).

Finally, this section includes a summary of personal income and employment by industry sector. This is important for economic impact analyses of resource management/policy decisions.

Labor Force. In 2010, there were more than 2.55 million people in the labor force of the study area or about 14% of the entire labor force of California (Table 4.6-5). The study area labor force grew faster than that of California, but slower than that of Mendocino and Sonoma Counties over the 1990-2000 period. In the 2000-2010 period, California's and Mendocino and Sonoma Counties' labor forces continued to grow whole the study area's labor force contracted (Figure 4.6-8).

Table 4.6-5. Labor Force and Labor Force Growth

Year	California	Study Area	Mendocino & Sonoma
1990	15,168,531	2,270,078	245,109
2000	16,857,578	2,579,576	296,836
2010	18,316,411	2,550,922	299,637
Labor Force Growth (%)			
1990-2000	11.1	13.6	21.1
2000-2010	8.7	-1.1	0.9

Source: U.S. Department of Labor, Bureau of Labor Statistics

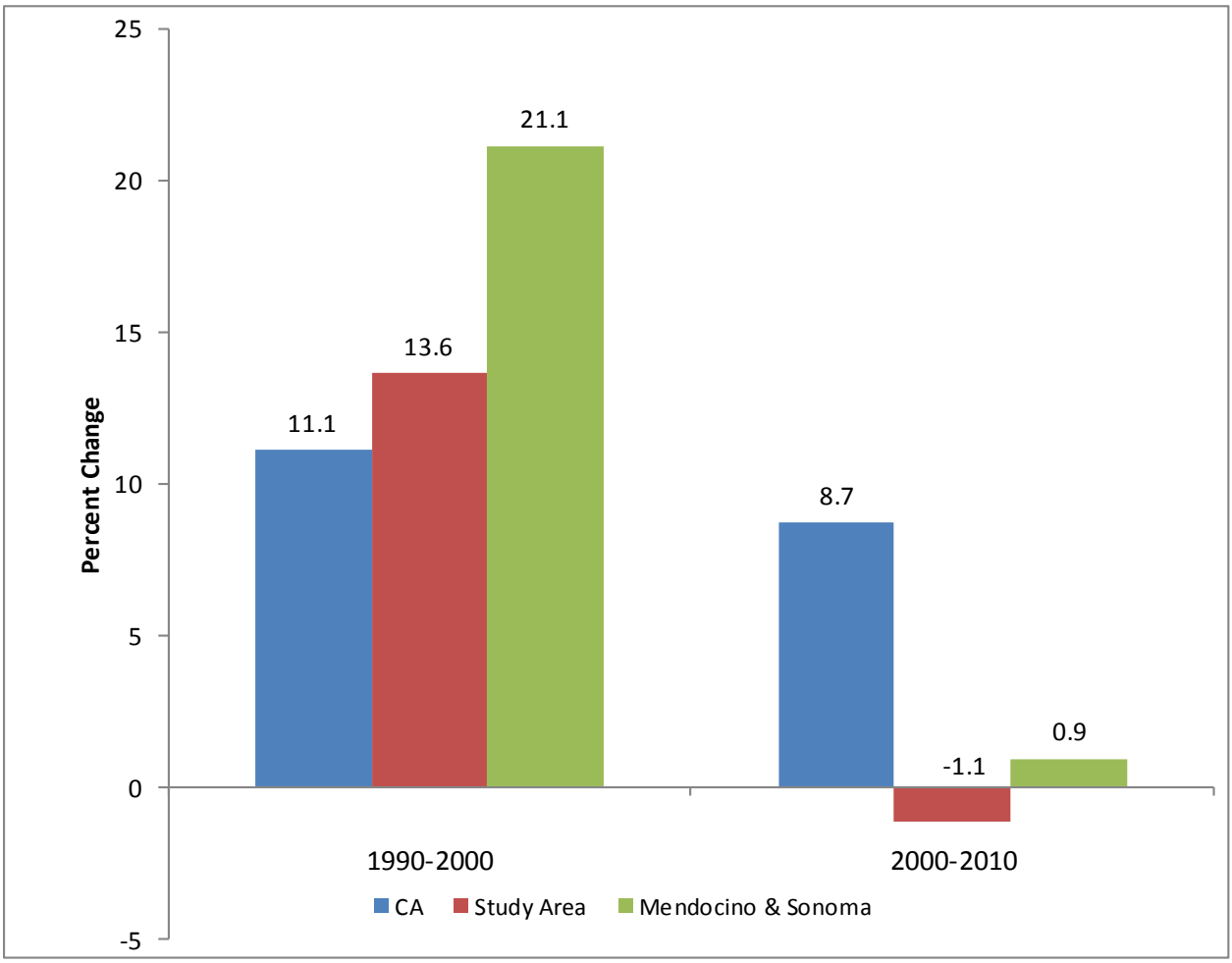

Figure 4.6-8. Labor Force Growth 1990-2000 and 2000-2010 in California versus the Study Area and Mendocino and Sonoma Counties

Personal Income. The U.S. Department of Commerce, Bureau of Economic Analysis (BEA) maintains two concepts of personal income in their Regional Economic Information System. Income is reported by "place or work" and by "place of residence." Income by "place of work" is where the income generated by work in the geographic area of study, and is reported by economic sector (e.g. farm, manufacturing, retail, wholesale, etc.). Income by "place of residence" is reported by where the income is received. It is the total amount of income received by those who live in the study area. It includes income from investments, pensions, social security payments and other transfer payments. In addition, it includes income earned in areas from work outside the study area. This would include the income earned in a county where one works which is outside the study area. The amount of income earned by people who live outside the study area is subtracted as they take their incomes home to areas outside the study area. This information comes from the "Census of Inter-county Commuters" and BEA uses it to form what is called the "residence adjustment" which can be either positive or negative depending on whether people living in the study area and working outside the study area are earning more or less than people living outside the study area and working inside the study area. Economists often refer to this as the "Bedroom Community Effect." In using the IMPLAN input-output model to estimate the economic impacts of activity in the study area and important first step is defining the study area of impact. Since IMPLAN assumes that all those who work

in the study area live in the study area and thus spend most of their income there, defining the study area such that the "bedroom community effect" is small makes estimates more accurate. Income by "place-of-work" as a percent of "total income by place-of-residence" serves an as indicator of two key aspects of a study area's economy: whether it is an economy with a significant "bedroom community" and/or there is a large retirement community. When the percent of income by place of work is low relative to income by place of residence (below 100%, Table 4.6-6), economists then look to the "resident adjustment" and the amount of transfer payments in pensions and social security payments to further describe the nature of the local economy.

In 2010, study area income by place of work as a percent of income by place of residence was 74.1% and ranged from a low of 47.5% in Marin County and a high of 111.5% in San Francisco County. All counties in the Study Area have incomes by place of work lower than income by place of residence, except for San Francisco County (Table 4.6-6). Income by place of work as a percent of income by place of residence was higher in the study area and California than Mendocino and Sonoma Counties over the 2000 to 2010 time period and declined in both the study area and California over this period (Table 4.6-7 and Figure 4.6-9).

Table 4.6-6. Personal Income by Place of Residence and Place of Work, 2010

County	Income by Place of Residence ($000)	Income by Place of Work ($000)	Work as Percent of Residence
Alameda	$72,024,822	$55,762,084	77.4
Contra Costa	$57,700,398	$29,351,680	50.9
Marin, CA	$20,854,466	$9,895,696	47.5
Mendocino	$3,049,993	$1,644,157	53.9
San Francisco	$55,850,894	$62,256,151	111.5
San Mateo	$47,946,507	$35,037,442	73.1
Sonoma	$20,975,353	$12,387,049	59.1
Mendocino & Sonoma	**$24,025,346**	**$14,031,206**	**58.4**
Study Area Total	**$278,402,433**	**$206,334,259**	**74.1**

Source: U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Information System

Table 4.6-7. Personal Income by Place of Residence and Place of Work

Year/Area	Income by Place of Residence ($Millions)	Income by Place of Work ($Millions)	Work as Percent of Residence
2000			
Mendocino & Sonoma	$19,597	$12,170	62.1
Study Area	$224,990	$175,866	78.2
California	$1,135,342	$895,920	78.9
2005			
Mendocino & Sonoma	$22,183	$14,349	64.7
Study Area	$250,033	$194,278	77.7
California	$1,387,661	$1,093,320	78.8
2010			
Mendocino & Sonoma	$24,025	$14,031	58.4
Study Area	$278,402	$206,334	74.1
California	$1,564,209	$1,156,546	73.9

Source: U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Information System

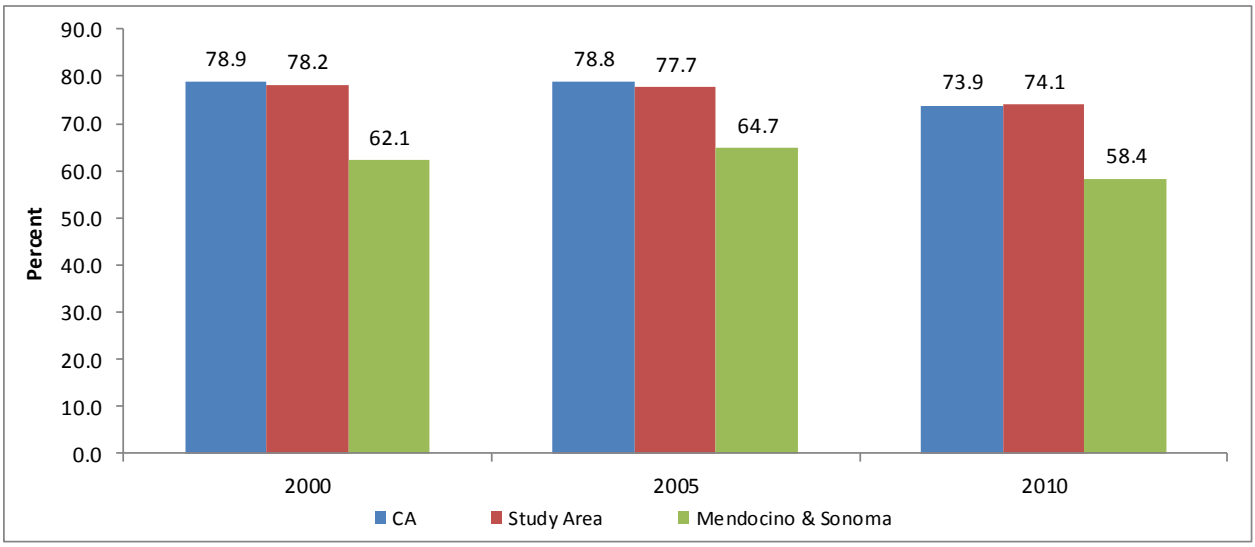

Figure 4.6-9. Income by Place of Work as a Percent of Income by Place of Residence in the Study Area versus California and Mendocino and Sonoma Counties, 2000, 2005 and 2010

Employment. In 2010, over 2.99 million people were employed in the study area or about 15% of all employment in California (Table 4.6-8). Total employment in the study area grew faster than in the state but slower than in Mendocino and Sonoma Counties during the 1990-2000 period. In the 2000-2010 period, total employment continued to grow in the state while it declined in the study area and Mendocino and Sonoma Counties (Figure 4.6-10).

Table 4.6-8. Total Employment, 1990-2000 and 2010

County	1990	2000	2010
Alameda	754,274	893,811	854,126
Contra Costa	397,329	473,865	470,495
Marin, CA	148,302	177,080	177,066
Mendocino	42,314	49,369	46,884
San Francisco	702,360	759,212	719,646
San Mateo	397,001	500,077	460,901
Sonoma	204,435	271,800	261,631
Mendocino & Sonoma	**246,749**	**321,169**	**308,515**
Study Area Total	**2,646,015**	**3,125,214**	**2,990,749**
California	**16,834,516**	**19,466,162**	**19,732,278**

Source: U.S. Department of Commerce, Bureau of Economic Analysis Regional Economic Information System

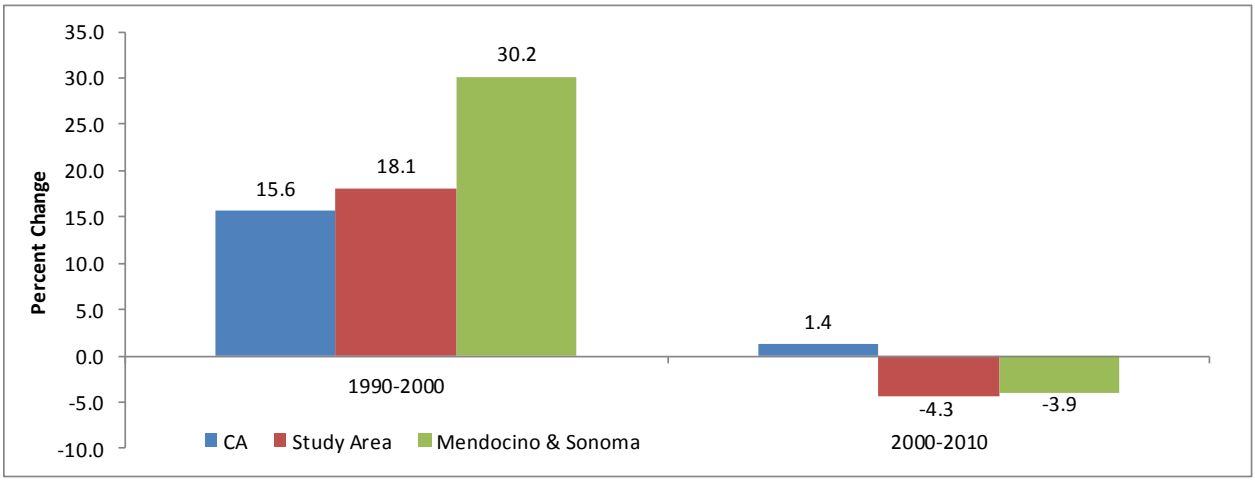

Figure 4.6-10. Total Employment in the Study Area versus California and Mendocino and Sonoma Counties 1990-2000 and 2000-2010

Proprietors' Income and Employment. When analyzing the potential impacts of sanctuary management strategies and regulations, it is a requirement under the Regulatory Flexibility Act to analyze the potential impacts on small entities, which are primarily small businesses. NOAA will conduct this separate analysis as part of the rulemaking process. Usually almost all businesses related to either the commercial fishing industry or the recreation-tourist industry are small businesses. Good indicators of the extent of small businesses in the study area are the extent of proprietors' income and employment.

In 2010, there were 756,000 proprietors employed in the study area making up 25% of total employment in the study area. The proprietors earned almost $26.2 billion, which was almost 13% of the income earned by place of work in the study area (Table 4.6-9). The percent of proprietors' employment was higher in Mendocino and Sonoma Counties than the study area and higher in the study area than the U.S. for 2000 to 2010. The opposite trend is true for proprietors' income as a percent of total income (Table 4.6-9 and Figures 4.6-11 and 4.6-12).

Table 4.6-9. Proprietors' Income and Employment

Year/Area	Proprietor's Income ($000)	%	Proprietor's Employment (000's)	%
2000				
Mendocino & Sonoma	2,466,614	12.6	82	33.4
Study Area	26,690,701	15.2	617	19.8
California	136,625,067	15.3	3,844	16.9
2005				
Mendocino & Sonoma	2,816,106	12.7	92	28.6
Study Area	29,655,806	15.3	686	22.7
California	168,214,490	15.4	4,261	21.1
2010				
Mendocino & Sonoma	2,166,644	9.0	93	30.1
Study Area	26,199,661	12.7	756	25.3
California	146,825,576	12.7	4,685	23.7

Source: U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Information System

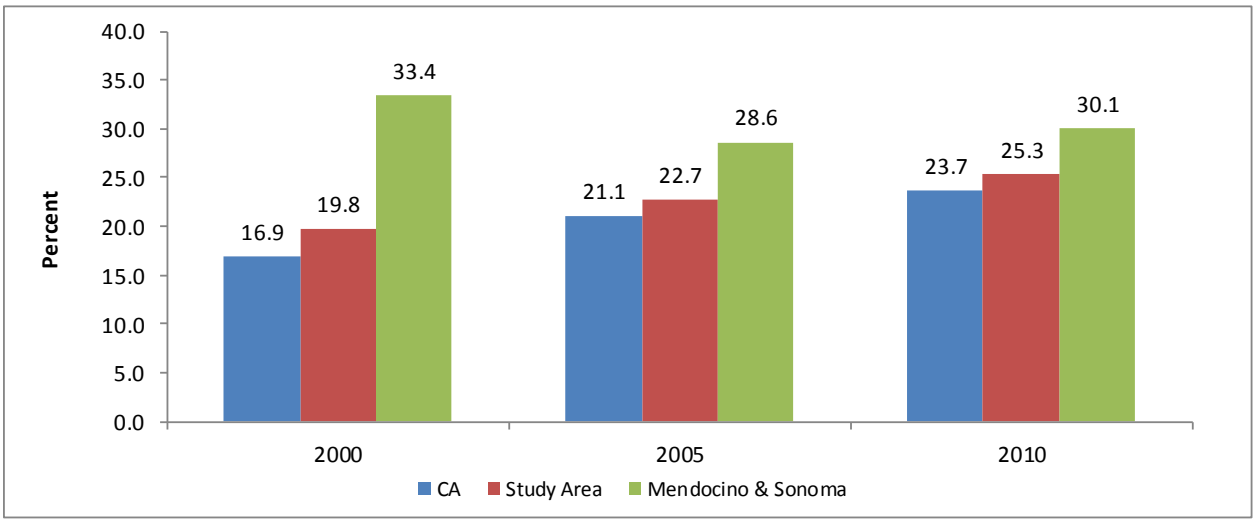

Figure 4.6-11. Proprietors' Employment as a percent of Total Employment in the Study Area versus California and Mendocino and Sonoma Counties, 2000, 2005 and 2010

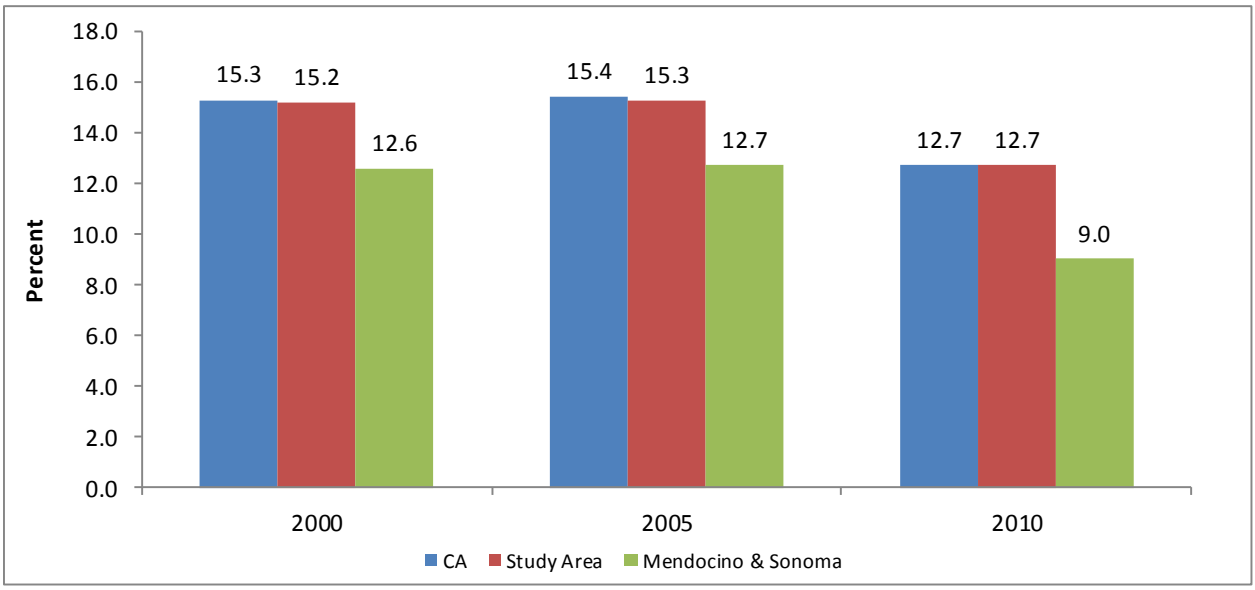

Figure 4.6-12. Proprietors' Income as a Percent of Total Income in the Study Area versus California and Mendocino and Sonoma Counties, 2000, 2005 and 2010

Personal Income and Employment by Industry Sector. The U.S. Department of Commerce, Bureau of Economic Analysis (BEA) in its Regional Economic Information System reports income and employment for different geographic areas by industry or economic sector using the North American Industry Classification System (NAICS) industry classification codes. The NAICS codes identify different sectors of the economy using codes up to four digits, the higher the number within a sector the more specific the industry. For example, "retail trade" is the 44-45 series. So at the 44-45 level, all retail trade is included. Code 441 is "motor vehicle and parts dealers" and code 442 is "Furniture and home furnishing stores." For the counties in our study area, we only report at the highest level i.e. for each series only the "00" level of detail. Even here, for some counties within the study area, the information is classified as "D" for non-disclosure meaning the numbers cannot be reported because there are less than 10 firms in that industry of economic sector in the county. So when we add up across counties for the study area, if one county within the study area has less than 10 firms in a sector, the whole study area will be coded "D" for non-disclosure. If the entire study area has less than 10 firms in a given industry or economic sector, it is possible to request a special run by BEA for the study area totals. We have not done that here.

Personal Income by Industry. In 2010, the study area had a higher proportion of its personal income generated in the "Professional, scientific, and technical services" and "Finance & Insurance" sectors than the state of California and Mendocino and Sonoma Counties (Figure 4.6-13).

Employment by Industry. In 2010, the study area had a higher proportion of its employment generated in the "Professional, scientific, and technical services" and "Finance and insurance" sectors than the state and Mendocino and Sonoma Counties with a lower proportion from "Retail trade" and "Farm earnings" (Figure 4.6-14).

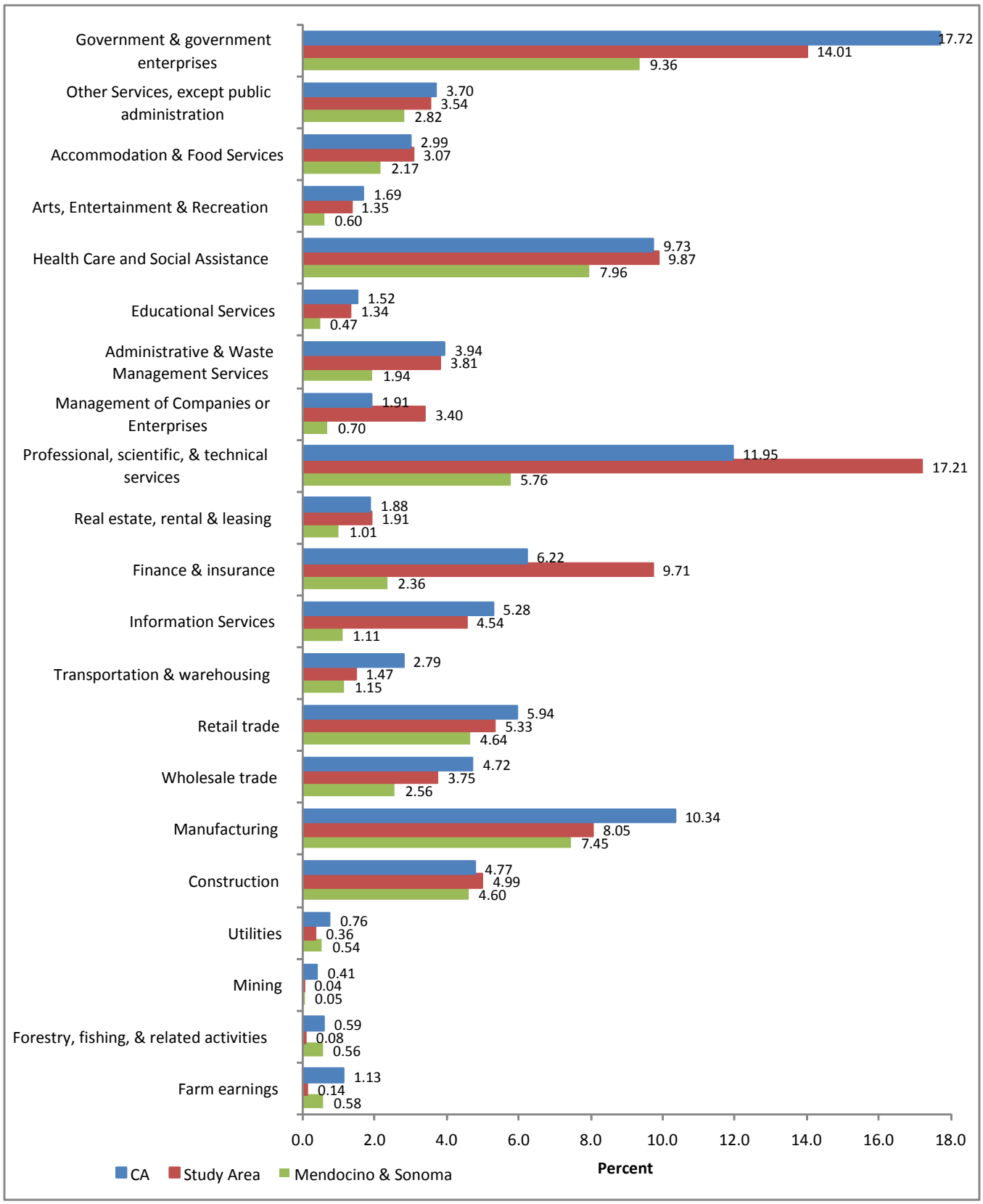

Figure 4.6-13. Percent of Personal Income by Industry for the Study Area versus California and Mendocino and Sonoma Counties, 2010

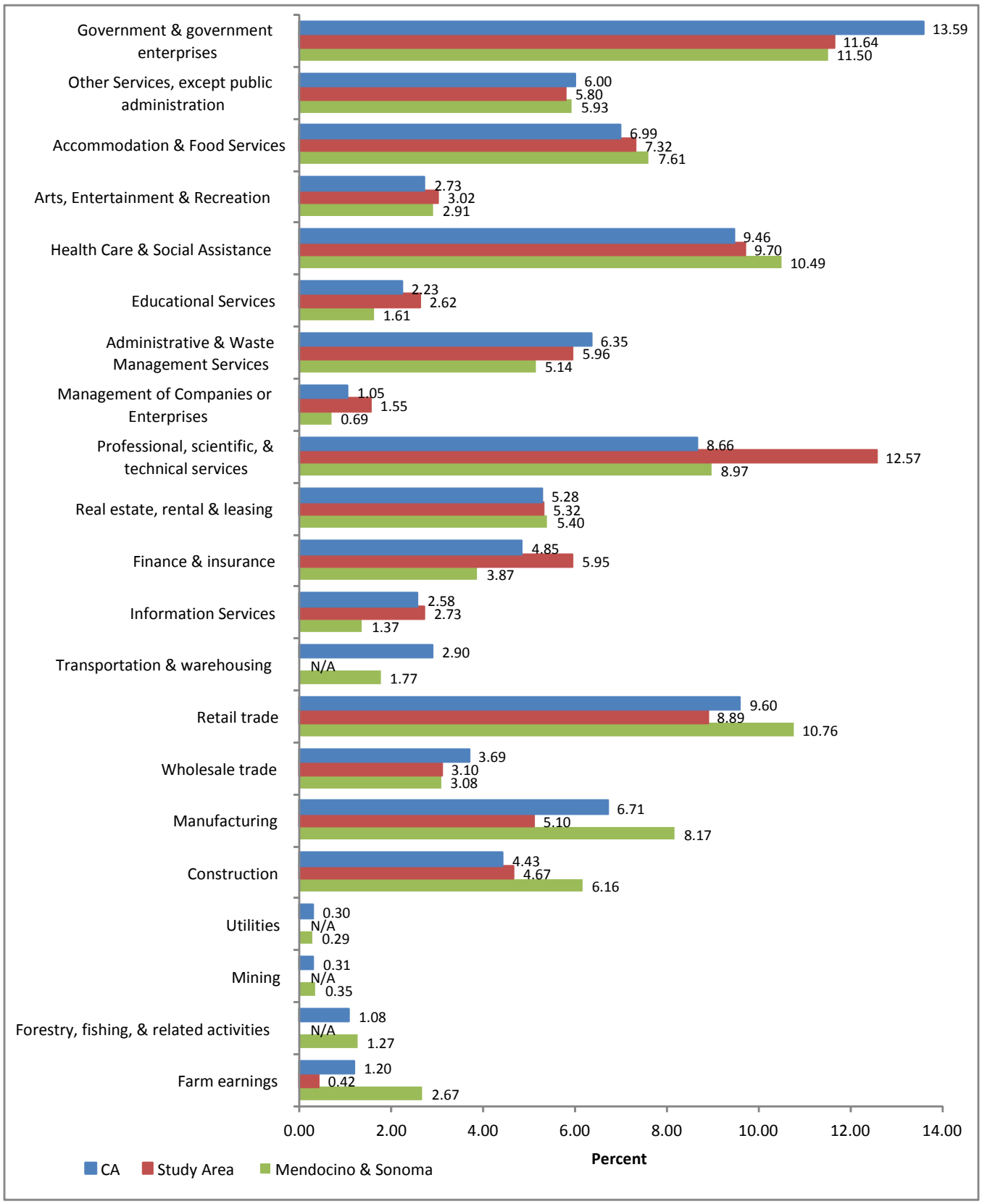

Figure 4.6-14. Percent of Employment by Industry for the Study Area versus California, 2010

Recreation and Tourism

The study area for recreation and tourism encompasses the proposed sanctuary expansion area and the adjacent shoreline in Sonoma and Mendocino Counties. Public access is included in this discussion and refers to access to the shoreline and Pacific Ocean. The description of recreational uses is focused on coastal recreational activities.

Public Access

About half of the 55-mile Sonoma County coastline is in government ownership, but not all of that land has public coastal access (Sonoma County 2013b).

The Sonoma County Regional Parks Department and the California Department of Parks and Recreation (California State Parks) own facilities as well as undeveloped land. Some large, varied sections of the coastline and the tidelands from Gualala to Jenner are open to the public, including North Jenner Beach, Fort Ross Historic Park, Salt Point State Park, and Gualala Point Regional Park. Public access is limited in other sections, most notably from Gualala Point Regional Park to Stewarts Point and within the privately owned Timber Cove subdivision. The Sea Ranch, south of Gualala, is another privately owned subdivision that offers limited public access at several points along Highway 1. There is some limited access to the Russian River between Duncans Mills and the river mouth, while the mouth is accessible from Jenner and the Goat Rock area. The south Sonoma coast is very accessible to the public. The California Department of Parks and Recreation owns coastal property from the Russian River to Bodega Head, with the exception of the privately owned Pacific View Estates and Gleason Beach subdivisions, a few individual parcels, and the Bodega Marine Laboratory. Numerous access points include parking lots, trails, trash receptacles and restrooms (Sonoma County 2013b).

Public access is limited in the 20 miles between Gualala and Manchester State Beach in southern Mendocino County. Most of the state and county beaches are in the northern part of this stretch around Point Arena. This includes the 1,130-acre Stornetta Public Lands, located at the mouth of the Garcia River. This property, which has been called one of the most significant parts of the Mendocino coastline, includes rugged cliffs, rumpled dunes and rolling meadows. In 2005, Larry Stornetta transferred title of the Stornetta Ranch to the Bureau of Land Management to ensure its long term protection and accessibility to the public. Recently, Congressman Jared Huffman introduced a bill to include these lands as part of the California Coastal National Monument (County of Mendocino 2013c).

Specific public access points are identified in the Sonoma County Local Coastal Plan, Coastal Element of the Mendocino County General Plan (County of Mendocino 2013b) and also in California Coastal Commission's California Coastal Access Guide (CCC 2003).

Recreational Uses

The waters and adjacent shoreline of the proposed expansion area offer a host of recreational opportunities. The scenic and rural coastline draws visitors from the greater bay area, state, nationally, and internationally. Most of the visitor use related to the expansion area is concentrated in adjacent coastal areas, particularly at the main access points distributed along the shoreline.

Recreation activities in the area include beach visitation, coastal hiking, photography, tidepooling, abalone diving, SCUBA diving (both consumptive and non-consumptive), recreational fishing (private boats, commercial passenger fishing vessels, shore based), whale and other marine wildlife watching, bird watching, surfing, recreational boating, camping, and sightseeing along the coast highway. Many of the visitors to this area stay overnight in campgrounds, a hotel, motel, bed and breakfast inn or vacation home rental along the coast.

Ocean uses in the proposed expansion area were estimated by NOAA staff members using information provided by regional experts in 2008-2009 as part of a broader Marine Protected Areas Center Ocean Uses Atlas Project. Spatial coverage of recreational uses in the proposed expansion area by national marine sanctuary is depicted in Table 4.6-10. These data represent broad-brush identification of areas over large distances, and focus on the dominant footprint patterns of use rather than more complex or localized issues (NOAA 2013).

Table 4.6-10. Spatial Coverage of Recreational Ocean Uses in Proposed Expansion Area Waters

Uses	Cordell Bank NMS % New Proposed Area	Gulf of the Farallones NMS % New Proposed Area
Recreational Non-Consumptive Sector		
Sailing	0	0
SCUBA/Snorkeling	0	1
Surface Water Sports	0	0
Swimming	0	0
Tidepooling	0	1
Wildlife Viewing at Sea	14	16
Recreational Fishing/Hunting Sector		
Hunting	0	0
Recreational Dive Fishing	0	4
Recreational Fishing from Boats	100	100
Recreational Kayak Fishing	0	7
Recreational Shore-Based Harvest	0	2
Shore-Based Fishing	0	2

Source: NOAA 2013.

Beach Visitation and Coastal Hiking

Beach visitation and hiking are popular activities especially in the southern part of the proposed expansion area at county and state beaches between Bodega Bay and Jenner. This area has several public beaches with easy access, and is close to major population centers in Sonoma County. While the north coast weather can be foggy in the summer, it usually burns off by midday and the cool ocean breezes make the Sonoma Coast a haven for visitors seeking to escape the inland heat (State Parks 2013a).

A network of trails on public lands along the coast provides easy access for hikers. This is a popular activity and visitors often walk along coastal bluffs and enjoy the spectacular coastal scenery. Due to budget cuts, many of the public parks have reduced hours and imposed seasonal closures in 2013.

Sonoma Coast State Beach (Park) is the most popular state park adjacent to the shore within the study region (Table 4.6-11), and is the second most visited coastal state park in California (See California 2013). The Sonoma Coast State Beach is a series of beaches separated by rock bluffs and headlands, extending 17 miles from Bodega Head to Vista Trail located 4 miles north of Jenner. Beachcombers, fishermen, sunbathers and picnickers can access the beach from more than a dozen points along coast Highway 1.

There are a number of coastal recreation areas near or partly within the study area. The California Department of Parks and Recreation manages Manchester State Beach (Park), which also contains an ocean or "underwater" component; Schooner Gulch State Park; Kruse Rhododendron State Natural Reserve; Salt Point State Park, which contains an ocean component; Fort Ross State Historic Park, which contains an ocean component; and Sonoma Coast State Beach (Park). Sonoma County Regional Parks manages Gualala Point Regional Park and Stillwater Cove Regional Park. The Sea Ranch Association manages coastal public access areas on Association property. The City of Point Arena manages Arena Cove and Pier, Centennial Playground and Fishermen's Playground, and Rockwell Park. Many of these recreation areas offer access points, services and facilities for both day and overnight use of coastal and near shore areas. Boat launch facilities are described under Recreational Boating, later in this section.

Table 4.6-11 lists State Park attendance in the study area and Table 4.6-12 lists the Sonoma County Regional Park and Sea Ranch trails attendance in the study area; both tables also note which facilities have overnight use.

Table 4.6-11. Attendance at California State Parks Adjacent to the Shore in the Study Region (fiscal year 2010/2011)

Park Name	County	Total Attendance
Fort Ross State Historic Park*	Sonoma	224,242
Kruse Rhododendron State Natural Reserve	Sonoma	22,792
Manchester State Beach*	Mendocino	61,087
Schooner Gulch State Park	Mendocino	17,016
Sonoma Coast State Park	Sonoma	3,13165

*Has overnight facilities
Source: California State Parks 2013b.

Table 4.6-12. Attendance at Regional Parks and Sea Ranch Trails Adjacent to the Shore in the Study Region (fiscal year 2010/2011)

Park Name	County	Total Attendance
Gualala Point Regional Park*	Sonoma	68,675
Sea Ranch trails	Sonoma	53,039
Stillwater Cove Regional Park*	Sonoma	25,887

*Has overnight facilities
Source: Sonoma County Regional Parks 2013c.

Recreational Fishing

Recreational fishing is a significant industry and activity along the California coast. Fish and wildlife resources and uses, including recreational fishing, are managed by the California Department of Fish and Wildlife (CDFW), formerly California Department of Fish and Game (CDFG). Second only to Florida,

the state of California contains more than 2.7 million residents who saltwater fish (CDFG 2005). Various forms of recreational fishing are used throughout the north central coast study region, with recreational fishing from boats estimated to take place throughout the entire proposed expansion area, and recreational harvest from shore/shore-based fishing, and recreational kayak fishing and dive fishing occurring throughout the coastal waters in the study area in varying intensities depending upon the activity (NOAA 2013). It is likely that motorized personal watercraft (MPWC) operation is also used on a limited basis for recreational fishing in the proposed expansion area.

In 2000, approximately 440,000 saltwater anglers, mostly California residents, fished the Pacific Ocean off the coast of California from Monterey County north over 2.2 million days (Ehler, Leeworthy and Wiley 2003).

Recreational fishing is a major source of income for the tourism and recreation sector in the north central coast study region. The main boat-based modes of fishing include commercial passenger fishing vessels (CPFVs), private and rental skiffs, and kayaks (angling, diving or free diving). Most of the CPFV activity is out of Bodega Bay and targets salmon, crab and rockfish. Closures in specified depths for federally managed groundfish (including many species of rockfish) have been in place since 2001, and have redirected most recreational fishing for groundfish from deeper offshore reefs to shallower nearshore areas. Shore based modes of recreation fishing include beach and bank fishing, fishing from manmade structures, poke-poling, free-diving and shore picking and spear fishing. Primary target species for recreation fishing in the study region include Chinook Salmon, rockfishes, lingcod, cabazon, kelp greenling, California Halibut, sanddabs and albacore. There is also recreational harvest of Dungeness crab using traps, often in combination with trips for other target species (CDFG 2007). With area closures associated with the state's Marine Life Protection Act, some coastal areas are closed to recreational fishing.

Although there are not any recent studies for the expansion area, a survey conducted in central California may shed comparable light on interests for fishing in this area. The survey sampled from Monterey north, including several coastal ports in Monterey, Moss Landing, Santa Cruz, Half Moon Bay, and San Francisco Bay marinas. As presented in Table 4.6 13, the study indicated that residents' preferred mode of fishing was by use of private/rental boats or from the shore. Most nonresident anglers fished from party/charter boats (Ehler, Leeworthy and Wiley 2003). It is probable that fishing effort by private boats and charters would be a smaller percentage of total recreational fishing north of Bodega Bay due to the scarcity of ports or marinas between Bodega Bay and Arena Cove.

Table 4.6-13. Estimated Number of Days Fished and Participants in Central California by Mode and Resident Status (2000)

	Resident	Nonresident	Total
Total Days	2,074,628	92,377	2,167,005
Party/Charter Boat Days	198,267	39,429	237,696
Private/Rental Boat Days	963,959	30,961	994,920
Shore Days	912,402	21,987	934,389
Total Participants	387,927	51,221	439,148
Average Days Per Participant	5.3	1.8	4.9

Source: Ehler, Leeworthy and Wiley 2003.

Recreational harvest of abalone is a popular and economically important activity in the proposed expansion area. Free-diving and shore picking are the common methods to harvest red abalone from rocky intertidal and subtidal zones north of the Golden Gate Bridge. Free-divers enter the water from skiffs, kayaks, or shore and are prohibited from using SCUBA or hookah (air delivered to diver via above-water compressor and hose) equipment to harvest red abalone. Anglers also harvest red abalone by wading out into the shallow rocky intertidal areas at low tides and picking abalone off of the rocks. Popular diving sites in the expansion area include Fort Ross, Fort Ross Reef Camp, Salt Point, Sea Ranch, and Arena Cove where state and regional parks provide access and services for abalone fishing. However, during abalone season nearly every accessible cove in Sonoma and southern Mendocino Counties, where abalone effort is greatest, may experience harvesting (CDFG 2007). This fishery is managed by the CDFW and its abalone report card system generates data that provide both catch quantities and an approximate geographic distribution of the abalone catch. Table 4.6-14 lists the abalone report card landing sites and the annual average of estimated landings for 2002–2006. New regulations for harvesting abalone on the north central coast will be implemented in 2014 following a severe abalone die off in the fall of 2011. Also, some coastal areas associated with the State Marine Life Protection Act are closed to harvesting abalone.

Table 4.6-14. Abalone Report Card Landing Sites and Associated Average Annual Landings

Ref #	Report Card Site	Annual Average 2002-2006
1	Point Arena Lighthouse*	8,317
2	Arena Cove	10,528
3	Moat Creek	6,801
4	Schooner Gulch	613
5	Saunders Landing	1,212
6	Anchor Bay	5,443
7	Robinson Point	986
8	Gualala Point	1,047
9	Sea Ranch	12,610
10	Black Point	227
11	Stewarts Point	1,974
12	Rocky Point	459
13	Horseshoe Cove	1,823
14	Fisk Mill Cove	7,784
15	Salt Point	10,512
16	Ocean Cove	6,191
17	Stillwater Cove	3,858
18	Timber Cove	8,660
19	Fort Ross and Reef Camp	37,386
20	Jenner	2,350
21	Salmon Creek	1,032
22	Bodega Head	1,282
24	Point Reyes	616
Total		131,671

*The Point Arena Lighthouse report card landing site includes data from Stornetta Ranch which opened to public access in 2004. As a result of recent increase of effort at this site, averages from 2002–2003 and 2005-2006 are reported, however data from 2004 is excluded because the area opened part way through the abalone season.
Source: CDFG 2008.

CDFG began selling abalone report cards in 1998. Abalone report card sales from 1998 to 2005 remained fairly stable, ranging from 35,180 to 40,841, respectively. The proportion of all sport fishing license buyers who also purchased abalone stamps ranged from 28% to 33% between 1998 and 2005 (CDFG 2007).

Kelp Harvesting

Several scoping comments indicated that edible seaweed is harvested for consumption in the study area. Both edible seaweed harvest mentioned in scoping comments and commercial harvest are regulated by CDFW. Elsewhere in the state of California, commercial kelp harvest (typically giant kelp, Macrocystis) occurs in leased beds in waters no shallower than 30 feet and harvest occurs no shallower than 4 feet from the surface (typically 3 feet from the surface). In the proposed expansion area there are no active leases for commercial kelp harvest.

CDFW issues licenses (not leases) for edible seaweed harvest, which can be for personal consumption or for commercial sale. Limits set by CDFW are 10 pounds per person per day and two tons per year. Edible seaweed harvest is a growing use off the coast for many types of intertidal seaweed (e.g. Nori, Wakame, Kombu, Dulse, and Sea Palms). This type of harvest is done by hand in the intertidal area usually during low tide. Harvesters use knives, clippers, scissors to cut blades off the algal plant, typically leaving the bottom third of the plant so it can regrow.

SCUBA Diving

SCUBA diving is a popular recreational activity in the proposed expansion area especially in the area north of Fort Ross. This area typically has better underwater visibility and the near shore geology is mostly rock that provides interesting structure and supports healthy beds of bull kelp, algae, invertebrates and fishes. Salt Point State Park is a popular dive location with overnight camping and easy access to the water. Many of the campgrounds along the coast are crowded with divers in the summer and fall. Diving between storms in winter when ocean conditions are calm can offer some of the best visibility of the year when there are no plankton blooms that can limit visibility in the summer months. Near shore waters are accessed from shore, skiff or kayak and divers engage in spearfishing, photography or enjoying the spectacular underwater world of the north central coast. The coastal economy of this area relies on the steady influx of divers in the summer and fall.

Surfing

Ocean conditions north of Bodega Bay can be rigorous. With powerful swell, cold water and strong currents, many surf breaks in the area are demanding and not for novices. There are times, however, when conditions are not extreme and surfing occurs. Salmon Creek beach at the southern end of the proposed expansion area is a popular surfing destination. When the swell and tide are correct, hundreds of surfers can be in the water and the parking lots and turn outs will be filled with cars. Arena Cove is another surfing destination at the northern end of the proposed expansion area. Many of the other surf spots along this stretch of coast are remote and access is difficult, but experienced surfers find ways to access these areas.

Wildlife Viewing

Several onshore locations along the proposed expansion area are popular sites for viewing wildlife on different scales. Coastal promontories like Bodega Head draw hundreds of people a day during the gray whale migration period. In April, as mothers and calves swim to feeding areas in Alaska, they will sometimes be

very close to shore. There are many spectacular vantage points from high spots along Highway 1. In addition, several state parks have trails along coastal bluffs and viewing points for observing the gray whale migration and other wildlife. From many of these same vantage points observers can see harbor seals and sea lions lounging on coastal beaches or hauled out on rocks. The highway pull out north of Jenner is a favorite place for visitors to observe harbor seals on the beach at the mouth of the Russian River.

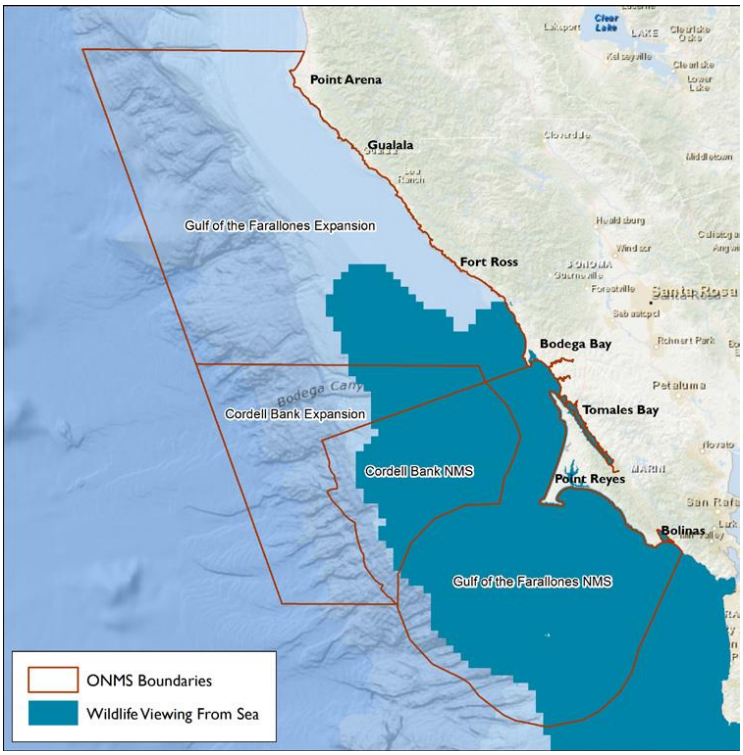

Figure 4.6-15. Wildlife Viewing from Sea Use Pattern in and Adjacent to Study Area 2008-2009 (based on data from expert knowledge) *Source:* NOAA 2013.

Charter boat trips that originate in Bodega Bay also provide wildlife viewing opportunities offshore. Bodega Canyon is a frequent destination and trips usually focus on viewing pelagic seabirds like albatross and shearwaters that rarely come near shore, blue and humpback whales that seasonally visit the area in summer and fall, and a variety of other marine mammals including porpoise and dolphins. As shown in Figure 4.6-15, approximately 14% of the proposed expanded CBNMS and 16% of the proposed expanded GFNMS showed patterns of wildlife viewing from sea in 2008-2009, mostly west of the area from the mouth of Tomales Bay to Fort Ross (NOAA 2013).

On a completely different scale, the rocky shorelines in the study area are teeming with life and can be enjoyed by visiting the tidepools during low tides. As the tide recedes, intertidal areas are exposed revealing dozens of different species of algae and an assortment of animals including barnacles, limpets, sea slugs, anemones, sea stars, urchins, crabs, chitons, abalone and sponges. Several of the state parks have docent led programs to help visitors safely observe the diversity of life in the intertidal zone.

There are numerous locations bordering the study area that are favorite places for bird watching. From Bodega Bay to Manchester Beach there are a variety of habitats that offer opportunities to see a diverse selection of birds. Coastal bluffs with shrubs and trees, sandy beaches and dunes, estuaries, rocky shorelines with near shore stacks, and high bluffs to view seaward offer opportunities for birders of all levels to see land birds, shorebirds, and pelagic species in one day.

It is the wild undeveloped nature of this region and the opportunity to view a diversity of wildlife that draws many people to this region of the California coast.

Recreational Boating

Recreational boating is enjoyed by residents and visitors in the proposed expansion area, using both motorized and non-motorized watercraft.

The most common motorized vessels used are power boats, but there is also limited use of MPWC in the region (see discussion below). Boat launch facilities for motorized vessels are available near the study area at Spud Point Marina and Doran Regional Park in Bodega Bay (Sonoma County Regional Parks 2013a), where the majority of motorized recreational boating in the study area occurs (see Figure 4.6-16); and adjacent to the study area at Ocean Cove (privately owned) (Ocean Cove Store & Campground 2013), Point Arena Pier (City of Point Arena 2013), Sonoma Coast State Park (California State Parks 2013c), Stillwater Cove Regional Park (Sonoma County Regional Parks 2013b), and Timber Cove (privately owned) (Redwood Coast Chamber of Commerce 2013). Pumpout facilities, mobile pumpout services and dump stations are discussed in under Water Quality (Section 4-02, Physical Resources).

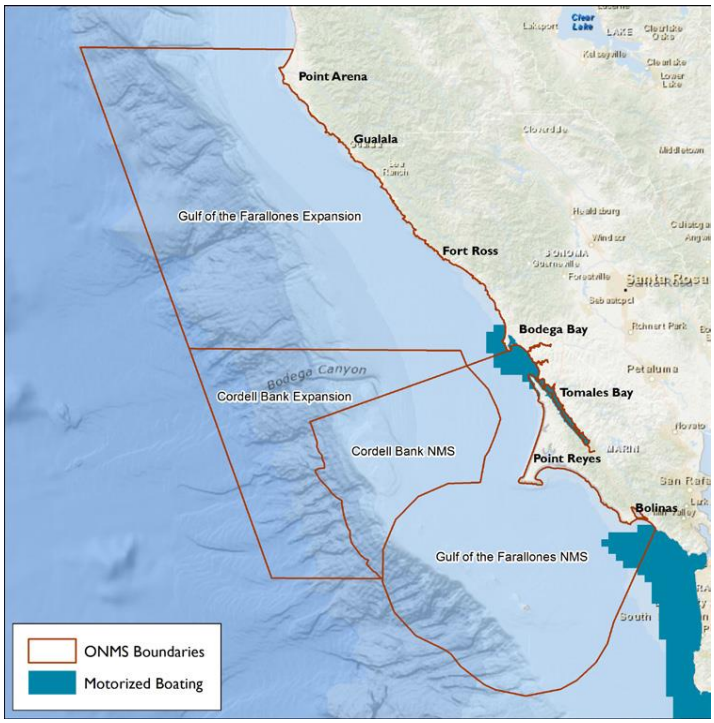

Figure 4.6-16. Motorized Boating Use Pattern in and Adjacent to Study Area 2008-2009 (based on data from expert knowledge). *Source:* NOAA 2013.

Sailing, kayaking, windsurfing and kite-boarding also takes place at various locations in or adjacent to the study area, and enthusiasts may either bring their own equipment or rent equipment. Patterns of sailing in the study area was limited in 2008-2009, and mostly occurred near Bodega. There are a number of kayak rental outfitters along the Sonoma and Mendocino coasts, and some windsurfing rental outfitters are located inland. These small non-motorized watercraft may be launched more easily than motorized vessels, with access points too numerous to list. As with other on-water sports in the study area, safe enjoyment of both sports is dependent on appropriate wind and water conditions, and on the training and experience of participants.

MPWC Use

MPWC, often referred to as "jetskis,"® include several small vessel designs that share similar performance characteristics. Within the proposed expansion area, MPWC are used for recreation including for surfing (to access remote offshore breaks and primarily for lifesaving purposes), fishing along the coast, and occasionally for abalone diving. These recreational uses occur along the coast, mostly within California State waters throughout the entire study area. Due to the steep, rocky shoreline and lack of harbors and ports in the study area, access points to deploy MPWC are limited and often not available due to seasonal closures, shoreline changes from storm activity, or other hydrologic and geomorphic factors. Some of the most extensive MPWC use occurs offshore of Sonoma Coast State Park.

Tourism

Tourism represents a portion of the local and regional economic condition, as tourism contributes to direct sales, employment and taxes. Travel expenditures provide the primary basis for assessing tourism.

In California, over the past few decades, a rise in the amount of money spent in California has been attributed to travel and tourism (CED 2011). After the recession of 2007-2009, California travel expenditures reached over $106.4 billion in 2012, which is a 4.5 percent increase from the previous year (in current dollars) (Runyan 2013).

Looking at the local level at the two primary affected counties (Mendocino and Sonoma), travel expenditures in Mendocino County were $313.9 million in 2011 (including accommodations, eating and drinking, retail sales, transportation and recreation, not including indirect revenues) (Runyan Associates 2013). Travel-generated employment was estimated at 4,790 jobs in 2011, which represents about ten percent of the total employment in the county. The county has generally experienced fluctuations in travel-generated employment similar to trends statewide.

Total annual tourism earnings (all the earnings of employees and business owners over the course of a year that can be attributed to travel expenditures, including wages and salaries, earned benefits, and proprietor income) were $118.2 million in 2011 in Mendocino County.

Tax revenue (in the form of local sales taxes, transient occupancy taxes, fees for service, fines or other sources) generated by travel expenditures is a measure of the fiscal benefit to local governments that is derived from travel and tourism. Total travel-related tax revenues in Mendocino County were $20.3 million in 2011.

Tourism in Sonoma County in 2011 had a direct economic impact of more than $1.4 billion annually, and represented about 17,000 local jobs. Total annual tourism earnings were $442.7 million in 2011. Tax revenues generated by travel expenditures in 2011 are estimated at $94 million; those funds are used for general funds for government, regional parks, arts and cultural organizations, affordable housing, and public safety (Runyan Associates 2013).

Specific data on coastal-related tourism economic effects is not available.

Land Use and Development

This section describes current land uses along the coast adjacent to the study area not described in other sections. Land use in the coastal areas of Mendocino and Sonoma Counties that are adjacent to or could be affected by the proposed action mainly consists of rural coastal communities with residential/industrial/civic/visitor serving/mixed uses, rural and remote residential uses, open space (public or quasi-public) uses, and agriculture uses.

The City of Point Arena and the unincorporated communities of Gualala, The Sea Ranch, Jenner and Bodega Bay are the largest coastal communities in the region, with other unincorporated, small communities scattered along the coast, including those at Manchester, Anchor Bay, Stewarts Point, Timber Cove, and Salmon Creek. There are harbor facilities and infrastructure at the City of Point Arena and the village of Bodega Bay.

Designated open space areas include the California National Coastal Monument (island, rocks, pinnacles and reefs offshore of the California coast) and Stornetta Public Lands, managed by the U.S. Department of the Interior, Bureau of Land Management (BLM); public coastal access areas, managed by The Sea Ranch Association; as well as numerous State, county and city parks (see Recreation, below).

Other uses in and adjacent to the study area include various types of agriculture, with livestock grazing prominent along Highway 1; forest land; commercial fishing (see Section 4.4, Commercial Fishing and Aquaculture); infrastructure to support residential and other developments; transportation; and telecommunications (County of Mendocino 2013a; County of Mendocino 2013b; Sonoma County 2013a; Sonoma County 2013b). In this area, Highway 1 is the main road, with smaller roads connecting with it, and there are three airports relatively close to the coastline: Lofty Redwoods Airport (private) (AirNav.com 2013a), Ocean Ridge Airport (public) (AirNav.com 2013b) and The Sea Ranch Airport (private) (AirNav.com 2013c). In addition to these airports, private and commercial aircraft originate from other airports in California and beyond, then transit through the airspace in the study area.

There are two active fiber optic telecommunications submarine cables in the area, which land onshore at the Manchester Cable Station (Telephone Central Office 2013), constructed as part of the Japan-U.S. project in 2001 (Submarine Cable Networks 2013). Onshore, the cables connect with the cable station inside a protective bore; this bore extends about a mile offshore. Seaward of that point to about a depth of 6,000 feet of seawater, the cables are buried in about one meter of sediment. These cables require periodic inspection and maintenance. There are three additional, unused AT&T conduits to the cable station as well, intended for future potential expansion. Four out of service cables (two fiber optic, one coaxial, and one unknown type) remain in this area as well; these were installed between 1957 and 1992 (Telephone Central Office 2013; Lott 2013.)

Research and Education

Research

Research is conducted within the proposed expansion by a wide array of public and non-profit groups, including: academic institutions, non-profit and community based organizations, regional, state and federal agencies, and citizen-science groups. Various studies include: monitoring for pollutants, water quality and impairment factors including temperature, sedimentation and gravel mining, kelp bed productivity, monitoring intertidal and subtidal communities, oceanography including upwelling and sea surface temperature, wave, wind and surface current monitoring, bird and mammal population distribution, status and trend and potential disturbance factors, fisheries assessment, and substrate and habitat mapping. Known research activities and agencies/groups conducting the research include the following:

- BLM, California Coastal National Monument, in partnership with California State Parks, Stewards of the Coasts and Redwoods, The Sea Ranch Association and Task Force, Madd River Consulting, City of Point Arena, Mendocino Coast Audubon Society, and Point Arena Lighthouse Keepers – Abundance and distribution of coastal birds and mammals, reduction of disturbance, and preservation of coastal cultural resources;
- Bureau of Ocean Energy Management – Seafloor mapping, abundance and distribution of marine birds;
- CDFW – Monitoring and assessment of the distribution and abundance of priority species including sport and commercial fish, abalone, seagrasses, and kelp bed abundance and distribution;

- California State University at Monterey Bay – Baseline assessment of state marine protected areas, designated under the Marine Life Protection Act, using remotely operated vessel (ROV) surveys to characterize soft and rocky shallow and deep-water habitats;
- Central and Northern California Coastal Ocean Observing System – Data consolidated on a web portal from a consortium of many marine research individuals, academic institutions, state and federal ocean monitoring programs;
- Ecotrust – Baseline assessment of state marine protected areas designated under the Marine Life Protection Act, assessment and quantification of recreational and sport uses of nearshore and coastline of San Mateo, San Francisco, Marin, Sonoma and Mendocino Counties;
- U.S. Environmental Protection Agency in partnership with NOAA and State Regional Water Quality Control Board – Offshore and coastal pollutants, Mussel Watch, assessment of pollutants, water temperature, sedimentation and siltation of impaired bodies of water including the Russian and Garcia Rivers;
- Farallones Marine Sanctuary Association – Baseline assessment of state marine protected areas designated under the Marine Life Protection Act, Long-term Monitoring Program and Experiential Training for Students, student and citizen science monitoring key intertidal species and mole crab (*Emerita analoga*) at Salmon Creek;
- The Marine Mammal Center and California Academy of Sciences – Research on marine mammal health in order to understand the causes of marine mammal strandings, and links to ocean health and veterinary techniques;
- National Marine Fisheries Service: Northwest Fisheries Science Center, Southwest Fisheries Science Center, Pacific Marine Environmental Laboratory, and Office of Protected Resources, Marine Mammal Stranding Network:
  - Assess juvenile rockfish recruitment every year and every three years they survey adult rockfish populations, ecological linkages and economics;
  - Assess Pacific Coast groundfish stock assessments, ecological linkages and economics, and habitat protection;
  - Assess seabird and mammal populations and distributions throughout the Exclusive Economic Zones;
  - Assess harmful algal blooms along the West Coast of North America;
  - NOAA Coastwatch monitors sea surface temperature and upwelling indices at Point Arena;
  - Assess upwelling and ocean acidification;
  - Research stock assessments, population dynamics, ecological linkages, and economics of Pacific coast groundfish and Pacific salmon;
  - Research and monitoring of mortality, detection and response to Unusual Mortality Events, and causes of mortality in marine mammals;
  - Develop and implement recovery plans for endangered and threatened species; and
  - Assess biogenic habitat, including kelp beds, marine and estuarine sea grasses, deep-sea corals and sponges

- Ocean Imaging:
  - Baseline assessment of state marine protected areas, designated under the Marine Life Protection Act
  - Aerial imaging, multispectral analyses to assess coverage of macroalgae, plants and bottom substrates in subtidal and intertidal ecosystems
- Partnership for Interdisciplinary Studies of Coastal Oceans (PISCO), in partnership with University of California and Stanford University – Interdisciplinary research and monitoring of large-scale coastal processes and subtidal and rocky intertidal ecosystems, using acoustic Doppler current profilers and field assessment of fish and intertidal plants, algae and invertebrates, baseline assessment of state marine protected areas designated under the Marine Life Protection Act;
- Point Blue Conservation Science (formerly Point Reyes Bird Observatory Conservation Science), in partnership with CBNMS, GFNMS, San Francisco State University, and Sonoma State University – Throughout most of Sonoma, Marin, San Francisco, and San Mateo Counties, monitors oceanographic conditions and how they relate to the distribution and abundance of krill, seabirds, whales and sea turtles, also assesses vessel activities and potential resources at risk from vessel strikes and oil pollution, assesses oceanographic frontal zones, and abundance and distribution of surface jellies (during several cruises, conducted surveys and collected samples in the CBNMS expansion area and over the rocky feature "the football" in the GFNMS expansion area);
- Reef Check – Baseline assessment of state marine protected areas, conducts shallow subtidal reef surveys for the baseline characterization and monitors the density of key fish, invertebrates, and algae indicator species;
- Russian River Estuary Management Project Pinniped Monitoring Plan (Sonoma County Water Agency and Stewards of the Coast and Redwoods 2011) – Monitoring pinniped haulouts near the Russian River at North Jenner and Odin Cove, to the north, and Pocked Rock, Kabemali, and Rock Point, to the south of the river, and Jenner logs, Patty's Rock, and Chalanchawi in the estuary.
- Sonoma County Water Agency – Monitoring water rights, flows and influences on fish habitat and species, including endangered and threatened species, assessment of effectiveness of habitat restoration projects;
- Sonoma State University, in partnership with University of California – Baseline assessment of state marine protected areas, characterization of sandy beach ecosystems and linkages between sandy beach and other nearshore ecosystems, including shorebird and beach wrack interactions;
- Stanford University and San Jose State University – Conducts population distribution and abundance studies for vertebrate, which includes tagging of pelagic predators, placing satellite tracking devices on sharks, whales, pinnipeds, fish, birds, reptiles and mammals, to determine key habitats;
- University of California, Davis Bodega Marine Laboratory – Physical oceanographic research regarding toxicology, biochemistry, molecular biology, physiology, and pathology of salmonids, abalone, ocean acidification *in situ* and laboratory experimentation and operates Bodega Ocean Observing Node, a surface current ocean observing system.

Education

Education and outreach activities along the coastal communities are conducted through various agencies and non-profit organizations. The BLM-administered California Coastal National Monument extends along the entire stretch of coast and has varying levels of partnership and educational activities in communities along the coast. There are three State Park visitor centers where coastal ecology and/or maritime heritage are highlighted, including the Sonoma Coast Visitor Center in Jenner, the Salt Point State Park Visitor Center, and the Fort Ross State Historic Park Visitor Center; interpretive signage is also located in this region. The Fort Ross State Historic Park's non-profit association, the Fort Ross Conservancy, provides support for interpretive and education programming, focusing on the rich maritime heritage in that location. Sonoma County Regional Parks operates a visitor center on the north end of The Sea Ranch, bordering the Gualala River Regional County Park. Within The Sea Ranch private community, the California Coastal National Monument stewards publish a trail guide for the trails that wind throughout the coast and facilitate public walks and talks on the public access points throughout The Sea Ranch.

On the north end of the study area, the Point Arena Lighthouse is owned, operated and maintained by the Point Arena Lighthouse Keepers. This group facilitates preservation and education about the historical and present day uses of the coast with docent led tours, overnight facilities, and a visitor center gift shop. The non-profit Stewards of Coast and Redwoods works closely with State Parks in the southern Sonoma coastal parks providing docents, interpretation, student programing and public programming. Coastal education grants that are available in this region include, but are not exclusive to: the National Marine Sanctuaries' BWET and Ocean Guardian programs, and the California Coastal Commission's Whale Tail grant program. There are a few small schools that serve the K-12 student population on the coast in Point Arena, Jenner, Manchester, Annapolis, and Cazadero as well as a few outdoor education facilities. The Point Arena Community Charter school is active in coastal stewardship education with classes that focus on becoming active coastal stewards. The Coastal Commission's Coastal Access guide (CCC 2003) highlights the public access points along the coast.

Passive Economic Use

Economists have long recognized a special class of non-market economic values for natural resources and the environment referred to generally as *nonuse* or *passive use* economic value. See Kopp and Smith (1993) for a detailed discussion. These values are widely accepted as legitimate values to include in benefit-cost analyses of environmental regulations. The term *passive use* has become more popular than the term *nonuse* because it is recognized that for people to have value for something they must have some knowledge about what they are valuing. People learn about natural resources or the environment they are asked to value through books, newspapers, magazines, newsletters, radio, television and other media sources. The people don't actually visit the sites and directly use the protected resources; they consume them passively through the many indirect sources. The values have been referred to in the literature as option value, bequest value and existence value to clarify people's underlying motives for their willingness to pay. For nonconsumptive users and passive users, the conditions of the ecosystem are important for determining the benefits of marine reserves. Marine reserves are known to change the status of the habitats protected and often result in changes in community structure and increased biodiversity. Also, one of the main benefits is the possibility of protecting a different functioning ecosystem (i.e., a more natural system with minimum human influence). These may be conditions for which these user groups would have a willingness to pay.

Passive economic use value is recognized as potentially the most important economic value of national marine sanctuaries. See Wiley (2003) for a detailed discussion about the use of this value in national marine sanctuaries and Bishop et al (2011) for the estimation of these values for the Main Hawaiian Islands coral reef ecosystem.

The following relevant definitions are used in the study of passive economic use values.

Consumer's Surplus: The amount that a person is willing to pay for a good or service over and above what they actually have to pay for a good or service. The value received is a surplus or net benefit. For natural resources, for which no one owns the resources and cannot charge a price 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. Consumer's surplus is applicable to both use and passive use value.

Option Value: The value to current non-users who would be willing to pay an amount to ensure possible future use. This value is based upon uncertainty about both their future demand and the state of future supply. One can think of this like buying an insurance policy for future use. Weisbrod (1964) first introduced the concept of option value. Bishop (1982) extends and further clarifies this concept.

Quasi-Option Value: The value of preserving options for future use given some expectation of the growth of knowledge. Quasi-option value is positive when there are uncertainties about the future benefits of preservation and negative when the uncertainties are about future development issues. Examples are issues about future scientific discoveries or commercial applications that might arise from future study. Fisher and Hanemann (1987) discuss and clarify this concept. To the extent that consumptive uses might eliminate certain resources, this concept becomes an important potential benefit of marine reserves.

Bequest Value: The value to people that never plan to visit, but would be willing to pay an amount to ensure that future generations can experience the area in a certain protected condition.

Existence Value: The value to people who never plan to visit, but would be willing to pay an amount to ensure the resource exists in a certain protected condition. Krutilla (1967) first introduced the concepts of bequest and existence values. Brookshire, Eubanks and Randall (1983) discuss important issues in estimating these values.

Economic Rent: A return on investment over and above a normal rate of return on investment. A normal rate of return on investment is that rate of return in which incentives are such that capital will neither outflow or inflow into the industry.

4.6.2 Regulatory Overview

Executive Order (EO) 12898, Federal Actions to Address Environmental Justice in Minority and Low-Income Populations

On February 11, 1994, President Clinton signed EO 12898, Federal Actions to Address Environmental Justice in Minority and Low-Income Populations. The purpose of this order is to require federal agencies to identify and avoid disproportionate impacts on minority or low-income communities. In compliance

with this EO, the socioeconomics environmental consequences section addresses environmental justice issues.

Executive Order 13045, Protection of Children from Environmental Health or Safety Risks

In April 1997, President Clinton signed Executive Order (EO) 13045, Protection of Children from Environmental Health Risks and Safety Risks. This EO requires federal agencies to identify, assess, and address disproportionate environmental health and safety risks to children from federal actions.

California Coastal Act of 1976, Cal. Pub. Res. Code § 30000 et seq.

The California Coastal Act of 1976 defines the "coastal zone" as the area of the state that extends 3 miles seaward and generally about 1,000 yards (910 meters) inland. In particularly important and generally undeveloped areas, where there can be considerable impact on the coastline from inland development, the coastal zone extends to a maximum of 5 miles (8 km) inland from mean high tide line. In developed urban areas, the coastal zone extends substantially less than 1,000 yards (910 meters) inland.

The Act establishes policies guiding development and conservation along the California coast. The Coastal Act requires that local governments lying wholly or in part within the coastal zone prepare a Local Coastal Program (LCP) for its portion of the coastal zone. LCPs implement the California Coastal Act by establishing plans that are consistent with the Coastal Act. A Local Coastal Program is defined by Coastal Act Section 30108.6 as "a local government's (a) Land Use Plans, (b) zoning ordinance, (c) zoning district maps, and (d) within sensitive coastal resources areas, other implementing actions, which, when taken together, meet the requirements of, and implement the provisions and policies of, this division at the local level." Almost all development within the coastal zone, which contains many wetlands, requires a coastal development permit from either the Coastal Commission or a local government with a certified LCP.

County and City Plans

The Mendocino County General Plan (County of Mendocino 2013a) and zoning regulations govern land use along the coastal areas in Mendocino County; the Local Coastal Program for the county serves as an element (County of Mendocino 2013b) of the General Plan (County of Mendocino 2013d). The Point Arena City Local Coastal Plan (LCP) and two segments of the Mendocino County LCP have been certified by the California Coastal Commission. The Pygmy Forest segment of the Mendocino County LCP has not been certified by the Coastal Commission, which retains original jurisdiction over this segment (California Coastal Commission 2012).

The County of Sonoma General Plan (Sonoma County 2013a), zoning regulations and LCP (Sonoma County 2013b) govern land use along the coastal areas in Sonoma County. The County of Sonoma LCP, part of the County's Local Coastal Program, has been certified by the California Coastal Commission (California Coastal Commission 2012).

Other Regulatory Requirements and Permit Processes

Other regulatory requirements and permit processes that affect land use in the study area include regulation of wetlands under Section 404 of the Clean Water Act and regulation of navigable waters under Section 10 of the Rivers and Harbors Act by the USACE; the regulations, plans and management procedures of the open space management authorities mentioned above; and California State Lands Commission

management of public lands under its jurisdiction, pursuant to the California Environmental Quality Act (California State Lands Commission 2013).

4.6.3 Impact Assessment Methodology

Criteria to determine the significance of impacts associated with socioeconomic, demographic, and environmental justice issues are based on federal, state, and local standards and regulations. Impacts are considered to be significant if the proposed action were to result in:

- Substantial changes in unemployment rate;
- Substantial changes in total income;
- Substantial changes in business volume;
- Changes in the local housing market and vacancy rates, particularly with respect to the availability of affordable housing;
- Conflicts with the objectives, policies, or guidance of federal, state, and local plans;
- A conflict or inconsistency with established land or water use plans (e.g., county plans);
- A substantial change in existing land or water uses;
- An interference with the public's right of access to the sea;
- A long-term preemption of a recreational use or substantial temporary preemption during a peak use season; or
- Disproportionately high and adverse human health or environmental effects on minority or low-income populations.

Socioeconomic, demographic, land use, recreation and environmental justice data in and around the sanctuary boundaries were examined to determine their sensitivity to proposed action impacts.

The method of analysis applied to the socioeconomics and environmental justice issue areas is qualitative since there is very little quantitative information to assess the proposed action and alternatives.

Social impacts and environmental justice are part of the larger issue of the impacts of regulations on equity and fairness. Social impacts often occur when economic and financial impacts on individuals and firms are large enough to leading to social disruptions and social ills like increased substance abuse, domestic violence, general increases in crime, and general negative impacts on the social fabric of communities. Environmental justice is about impacts involving disproportionate impacts on low income or minority populations.

4.6.4 Environmental Consequences

In evaluating the proposed action and alternatives against the significance criteria listed above, the following determinations were made:

- None of the alternatives would have the potential to cause changes in unemployment rates, personal or business income, housing or population. Proposed expansion of the CBNMS and GFNMS would not generally affect demographics of the study area.

- None of the alternatives would lead to any negative impacts on environmental justice. Expanding the sanctuary boundaries is expected to result in long-term beneficial impacts on local residents (including low-income and minority populations), as well as on the health and safety of children. Therefore, impacts on environmental justice are not discussed further in this impact analysis.

- For social impacts, the impacts across all regulations for all regulatory alternatives are not expected to rise to the level that any negative impacts would occur. Again, it is most likely there would be small positive impacts from increased protections provided by the added regulations for the sanctuary expansion area. For MSA National Standard 8,[1] community and social impacts would not be expected to rise to a level requiring a full social impact analysis. Therefore social impacts are not further discussed in the impact analysis.

- The alternatives would not conflict with federal, state or local plans, policies or regulations, including county land or water use plans, nor would they result in violations of NOAA regulations. Expansion of the sanctuaries is intended to offer additional resource protection, consistent with existing federal and state policy. Therefore, these issues are not addressed further in this impact analysis.

The following analysis focuses on human uses that may be potentially affected. In addition, passive economic use value is evaluated.

Proposed Action

Recreation and Tourism

Expanding CBNMS and GFNMS will not adversely affect public access to the shoreline as there are no prohibitions against public access. Ocean access will remain unchanged except for the establishment of designated zones and access routes for MPWC use in GFNMS (see below). Designating the waters off of Sonoma and Mendocino Counties as national marine sanctuaries would be expected to have beneficial effects on recreation and tourism overall. Sanctuary status may serve to attract visitors to the area and provide better quality resources in the future for residents of the area engaging in recreation activities in the proposed expansion area. It is likely that increased awareness of the coastal resources would occur through sanctuary educational information and programs. Sanctuaries across the U.S. generally increase recognition of their unique and remarkable natural and cultural resources, which lead to increased tourism opportunities (NOAA 2012). The expanded sanctuary boundaries would provide added protection to the natural resources that contribute to the area's value as a recreation-tourist destination, while not restricting non-consumptive activities such as boating, wildlife viewing and coastal access. This could result in a beneficial impact on recreation and tourism. Employment opportunities from increased tourism and recreation related activities include jobs related to the need for lodging, food, boating, transportation, guide services, and other incidentals to accommodate travelers interested in coastal activities and opportunities. In addition, local residents of the area engaging in recreation activities also spend funds on food, bait and tackle, oil and gas, sports equipment, equipment maintenance and repair, boat ramps and marina fees, and other incidentals related to their recreation activities.

[1] The Magnuson-Stevens Act (MSA) National Standard 8 refers to minimizing adverse economic impacts on fishing communities and ensuring continued access to their fisheries.

All participants in recreation-tourism receive non-market economic value from their recreation activities as well. Option value is also possible for those who are not current users but are willing to pay to have the option of using the resources in the future. Resource protection offers opportunities for increases in these values. Relevant proposed regulations are discussed individually in the following subsections.

Discharge Regulations

Establishing discharge regulations in the expansion area would be expected to provide an overall beneficial impact, by limiting pollution in the ocean environment, which would benefit tourists and recreational ocean users. Recreational boating would be subject to the vessel discharge prohibitions outlined in the proposed action. Section 4.8, Marine Transportation, includes information on the existing regulatory regime for vessel discharge and impacts on marine transportation vessels from the proposed action's discharge regulations, which would be expected to be minor and less than significant. Vessels for recreational use are normally smaller than those used in the marine transportation industry, but the regulatory regime for vessel discharge also generally applies to vessels used for recreation, except for those specific regulations that exclude recreational vessels and/or apply to other classes of ships (such cruise ships or large ships that hold 300 gross tons or more).

Section 312 of the Clean Water Act (CWA) (33 U.S.C. § 1322) requires the use of Marine Sanitation Devices (MSDs) for all vessels within 3 miles of the coast if equipped with an installed toilet. Vessels 20 meters (65 feet) and under may use a Type I, II, or III MSD. Vessels over 65 feet in length must have a Type II or Type III MSD. Smaller vessels may have MSDs (but are not required to), or may have portable toilets, portable sewage receptacles, or no toilet facilities. Beyond 3 miles from shore, under current federal regulations, vessels may discharge treated or untreated sewage from any type of MSD. Currently, graywater discharge from recreational vessels is allowed in the expansion area.

With implementation of proposed sanctuary regulations, most discharges would be prohibited throughout the expansion area. There would be exceptions for sewage discharged through a Type I or Type II MSD and for clean graywater discharge; sewage and graywater are the two most common recreational vessel discharges. The proposed discharge regulations would require that recreational boat operators dispose of harmful matter and other prohibited discharges outside of the sanctuary or at shore side pumpout facilities or dump stations, and vessel operators would be required to lock all MSDs in a manner that prevents discharge or deposit of untreated sewage. Some of the effluent would likely have to be discharged at harbor or marina pumpout facilities which could place additional burdens on them to accommodate the larger amount of waste disposed dockside. Portable sewage receptacles could be deposited in a dump station or other sewage reception facility. Although onshore pumpout facilities and dump stations are limited, due to the small scale of recreational boating and existing regulations regarding discharges, this incremental additional burden would be less than significant. Sewage and graywater discharges could also be made outside sanctuary boundaries. Should a vessel owner or operator choose to install an MSD or install or upgrade a tank for sewage or graywater to comply with sanctuary regulations, there would be one-time costs for purchase of the equipment and installation, and periodic costs for maintenance. Should a pumpout facility be used, there could be a cost each time to pump sewage or graywater from the vessel. There may also be a cost to some recreational boaters of the additional amount of time and/or fuel it would take to visit a pumpout or dump station facility or transit to outside national marine sanctuary boundaries to make a discharge. Due to these factors, the proposed action has the potential to cause some adverse

socioeconomic effects on recreational boating. However, since most recreational boating occurs relatively close to shore and discharges in State waters (3 miles) are already regulated by the CWA, the potential adverse impact on recreational boating would be minor and less than significant. Furthermore, the proposed management plans include provisions to assist agencies and port, harbor and marina management entities in pursuing availability and use of pumpout facilities and dump stations.

Submerged Lands Regulation

Recreation and tourism would be expected to receive negligible to moderate benefits from the added protections to habitats, which produce a flow of services that support recreation-tourist activities. On the cost side, there could be indirect costs associated with acquiring permits or authorizations for the construction and maintenance of recreational docks, piers and moorings. Under the proposed action, authorization could not be used to allow recreational activities involving disturbing submerged lands within the line representing the 50-fathom isobath surrounding Cordell Bank. There are no known proposals for new docks, piers or moorings in the proposed expansion area (See Land Use and Development). The costs of compliance with the submerged lands alteration regulation are expected to be negligible and less than significant.

Introduced Species Regulations

The proposed regulations could benefit native populations of fish and therefore provide a benefit to the recreation-tourism industry. Currently there is no known use of non-native species for baiting by recreational fishermen so it is not expected there would be any costs of these regulations to the recreation-tourism industry.

Oil and Gas Development Prohibition

The prohibition on oil and gas development and production activities provides for opportunities of increased habitat and water quality that would benefit the recreation-tourism industry. However, there are no current or planned oil and gas activities in the expansion area so expected benefits are negligible. Similarly, since there are no current or planned oil and gas activities in the proposed expansion area, the expected costs (opportunity costs or lost benefits due to the potential negative impacts of the oil and gas activities) are also expected to be negligible.

MPWC Zones

The only recreational activity that would be specifically regulated by the proposed action would be MPWC. As described in the Project Description (Chapter 3), the proposed action includes the establishment of one seasonal and three all-year MPWC zones (see Figure 3.2-11) in the GFNMS expansion area. Motorized personal watercraft would need to be equipped with a GPS unit and would be allowed to launch only at the four specified access areas and each zone would be designed to keep MPWCs offshore to the extent practicable. There is existing MPWC use in the proposed GFNMS expansion area (as noted in the affected environment section) that may be impacted by the proposed action. Research on the use of MPWC in the study area indicates that the proposed MPWC zones are locations where MPWC may be currently used. In the event that MPWC use is necessary outside of these zones, it is possible that the proposed authorization process could be used to allow such an activity if already permitted or authorized by another agency, subject to sanctuary approval or a sanctuary permit could be issued. Given the existing relatively low

level of MPWC use in the expansion area and the proposed establishment of MPWC use zones, the impact on MPWC users is expected to be less than significant.

Land Use and Development

Proposed action regulations that may affect land use and development include discharge prohibitions, prohibitions against constructing on or otherwise altering submerged lands, introduced species restrictions and overflight restrictions. Since the GFNMS boundary would commence at the mean high water line and CBNMS boundaries would all be offshore, coastal onshore development would not otherwise be subject to sanctuary regulations. The overall adverse impacts on land use and development would be minor and less than significant.

Discharge Regulations

Establishing discharge regulations in the expansion area would provide an overall beneficial impact, by limiting pollutants in the ocean environment. The proposed discharge regulations would apply within sanctuary boundaries and would also prohibit the discharge of sewage from onshore land uses or discharge of any material beyond the boundary of the sanctuaries that subsequently enters a sanctuary and injures a sanctuary resource or quality. As noted in Section 4.2 (Physical Resources), there is one permitted source of discharge into the expansion area at Bodega Marine Laboratory. Since there are no other existing or proposed sewage outfalls or discharge points, no adverse impact would result from the proposed discharge regulations. In addition, the proposed authorization process and sanctuary permit regulations would provide the potential to allow discharges. In the authorization process, if the use was approved by another agency and the sanctuary agreed that the activity would be consistent with sanctuary uses, the use may be allowed.

As noted above, the proposed action includes a prohibition on discharging harmful matter from beyond the boundary of the sanctuaries that enters a sanctuary and injures a sanctuary resource or quality. This measure would help reduce potentially harmful pollutants such as oil, sewage and other hazardous materials from injuring sanctuary resources. Although many land uses, such as livestock grazing, agriculture and suburban runoff may discharge pollutants that enter the sanctuaries, the threat of any one discharge injuring a sanctuary resource is very small to negligible. The combination of the distance from the pollution sources and the strong mixing action of the ocean tends to rapidly dilute the pollutants from individual sources to a level that is not likely to cause injury to a sanctuary resource. The proposed regulation, therefore, is targeted at high volume or harmful discharges, such as oil, untreated sewage and hazardous spills. At this time, ONMS is not aware of any user or planned uses that, through their normal activity, would be impacted by this proposed regulation.

Submerged Lands Regulation

For any coastal construction involving submerged lands in the proposed expansion area, prohibited activities would include constructing any structure other than a navigation aid on or in the submerged lands of the sanctuaries placing or abandoning any structure on or in the submerged lands of the sanctuaries; or drilling into, dredging, or otherwise altering the submerged lands of the sanctuaries in any way, except: by anchoring vessels; while conducting lawful fishing activities; or mariculture activities conducted pursuant to a valid lease, permit, license or other authorization issued by the State of California. However, through the proposed authorization and sanctuary permit processes, some uses impacting submerged lands, such as dock, pier, or submarine cable construction or maintenance could be approved by the ONMS

Director, if the uses met the conditions for authorization or permit issuance. The existing special use permit process (allowed under Section 310 of the NMSA; 16 U.S.C. Section 1441) could also be applied to some uses.

In addition to being required to obtain permits from the CSLC and California Coastal Commission, local building permits and possibly the USACE (if the project would obstruct or alter navigable waters), uses involving construction on submerged lands would be required to go through the sanctuary authorization process. This extra step would have a minor adverse impact on land use and development in the expansion area, but would provide a means to allow activities that would otherwise be prohibited. It should be noted that the proposed action sanctuary boundary does not include the inner harbor area of Arena Cove, so shore uses in the cove would not be subject to sanctuary regulations. The use of moorings in sanctuary waters is considered placement of a structure on the submerged lands of the sanctuary. Any existing or proposed moorings within sanctuary boundaries would be subject to the authorization process or could possibly obtain a permit from the sanctuary, if permit conditions could be met.

The proposed action authorization process would apply to the existing sanctuary areas of CBNMS and GFNMS as well as the expansion area, and would provide a new mechanism to allow most uses affecting submerged lands otherwise prohibited by sanctuary regulations. However, no authorization would be allowed for uses on or within the line representing the 50-fathom isobath surrounding Cordell Bank.

Currently, the only regulatory provisions to allow otherwise prohibited activities are the permitting regulations and the NMSA provision for special use permits.

A sanctuary permit is limited to uses that: further research or monitoring related to sanctuary resources and qualities; further the educational value the sanctuary; further salvage or recovery operations in or near the sanctuary; or assist in managing the sanctuary. A special use permit could be issued in the existing sanctuaries or expansion area for activities on or in submerged lands of the existing sanctuaries and the expansion area if an activity involved: placement and recovery of objects for a public event on non-living substrate, placement, and recovery of objects related to commercial filming (may also be allowed for discharge), continued presence of submarine cables on or within submerged lands, disposal of cremated human remain (may or may not involve submerged lands), and fireworks. Special use permit conditions would also need to be met. The activity would need to be compatible with the purposes of the sanctuary and protect sanctuary resources, must be conducted for no more than five years (unless the special use permit is renewed), must not cause loss or injury of sanctuary resources, and must be covered by general liability insurance or a bond.

Under the proposed action, the sanctuary would have the ability to allow most activities involving construction on or use of submerged lands.

Introduced Species Regulations

Implementing stricter regulations to reduce the number of introduced species would have a beneficial impact on land use in the coastal areas. Invasive fouling organisms such as mollusks and sea squirts can attach themselves to any solid substrate within the coastal areas. Such attachment of fouling organisms causes increased repair and maintenance costs for operations that involve the use of submerged structures,

such as piers and docks. By reducing the number of invasive species in the expansion area, this measure may decrease existing and future repair costs.

Although the proposed sanctuary regulations include a prohibition against releasing introduced species, the proposed GFNMS authorization process could be used to allow aquaculture businesses in State waters. Impacts on aquaculture are addressed in Section 4.4 (Commercial Fishing and Aquaculture).

Overflight Restrictions

The proposed action would prohibit low flying (less than 1000 feet) over the two SWPZs in the GFNMS expansion area, as well as five SWPZs in the existing GFNMS (see Figure 3.2-4 through 3.2-9). Areas currently subject to overflight restrictions in the existing sanctuary boundaries are related to designated ASBS and specified locations; the changes in the areas or zones subject to these restrictions, as shown in Figure 3.2-4 through 3.2-7, would not materially change from existing conditions. In the GFNMS expansion area, the establishment of two zones would have a minor impact on flight patterns. These zones are relatively small in size and could either be avoided or flight could occur at higher elevations over them. FAA would have to update the aeronautical charts to reflect the GFNMS overflight changes. A sanctuary permit or special use permit could be issued for operation of aircraft below the minimum altitude over sanctuary restricted zones, if the relevant permit conditions were met. The overall impact is less than significant.

Research and Education

The proposed action may include additional research and education activities, as allowed by sanctuary regulations and as called for in the management plans. The proposed action should not affect ongoing research and education activities in the expansion area. If anything, a beneficial effect on research and education may take place, if including the area in the sanctuaries facilitates additional research and education programs or projects. For research, non-market economic value would include potential increases in quasi-option value. Positive market economic impacts for research and education activities are also likely to the extent the expansion area results in increased research and education activities.

Passive Economic Use

The additional protections offered by all the regulations in the proposed action would be expected to increase passive economic use value. Moderate benefits from each proposed regulation as well as the aggregate potentially significant benefits are expected. Because passive users do not directly use the resources, they would not suffer any costs.

No Action Alternative

The No Action alternative would result in losses in the potential benefits (opportunity costs) from increased protection from sanctuary regulations and from sanctuary programs and projects. Similarly, the benefits associated with this alternative are the avoidance of the restrictions and costs imposed by the proposed regulations.

Recreation-Tourism, Research and Education and Passive Economic Use

The lack of protections offered by the proposed discharge, submerged lands alteration and introduced species regulations would result in moderate costs (opportunity costs or lost benefits) to the recreation-tourism industry, while resulting in negligible savings in costs of compliance with the proposed regulations in other alternatives. MPWC operation in the proposed expansion area would continue, unrestricted to zones. Recreational boaters would not be subject to sanctuary discharge regulations in the expansion area, but recreational boaters in the existing sanctuary area would not benefit from the proposed action exception for clean graywater discharges.

Land Use and Development

These uses would avoid the negligible costs of complying with new regulations required under the proposed action (benefits of the No Action alternative to these uses). There would be some expected losses (opportunity costs) from the lost opportunities afforded by increased protections under other alternatives. Both costs and benefits would be negligible and less than significant.

Research and Education

The No Action alternative would result in the lost opportunities of the benefits that would accrue from research and educational activities associated with the other alternatives. The lost benefits (opportunity costs) are expected to be moderate but less than significant. The benefits of the No Action alternative would be any savings in costs associated with research and education activities, which are expected to be negligible and less than significant.

Passive Economic Use

The lack of protections offered by the proposed action would potentially result in losses in passive economic use values in the No Action alternative.

Existing Regulations Alternative

Recreation and Tourism

Impacts would be similar to beneficial impacts described for the proposed action. The prohibition of MPWC use throughout the expansion area may cause an adverse impact on recreation and tourism compared to existing conditions, but the overall effect of the various resource protection regulations and educational programs would result in beneficial effects. On the cost side, the impacts of the regulations would also be similar to the proposed action with generally negligible costs.

The primary difference between the proposed action and this alternative, with regard to recreation, is that MPWC use would be prohibited throughout GFNMS. The only exception for MPWC use would be for emergency search and rescue missions or law enforcement operations (other than routine training activities) carried out by the National Park Service, USCG, Fire or Police Departments or other federal, State or local jurisdictions. While this may be a benefit for recreational uses such as wildlife viewing and kayaking, prohibition of MPWC use would affect the expansion area, where MPWC use is currently allowed. MPWC use is prohibited within the existing GFNMS boundaries so no new impact would occur within the existing GFNMS. Given the level of MPWC use in the expansion area, this impact is considered less than significant.

Land Use and Development

Impacts on land use and development related to discharge and submerged lands alteration would be similar to potential effects described for the proposed action. However, there would be no authorization mechanism to allow activities that involved discharges or construction on submerged lands. Approval of these uses would be limited to certification of existing permitted uses (e.g. offshore cables, moorings) at the time the sanctuary is expanded, or issuance of a sanctuary permit for a new or expanded use, if the use or activity met one or more of the criteria for issuing a permit. National marine sanctuary permits are limited to allow activities that: further research or monitoring related to sanctuary resources and qualities; further the educational value the sanctuary; further salvage or recovery operations in or near the sanctuary; or assist in managing the sanctuary. Although there are no currently planned uses that would be prohibited by existing sanctuary regulations, this is considered to be an adverse impact.

Another difference between this alternative and the proposed action for land use is that instead of establishing the two SWPZs in the expansion area and restricting low flights over these zones, the four existing ASBS in the expansion area would serve as overflight restriction zones, as shown in Figure 3.4-1. In the existing GFNMS, flights would be restricted, as they are currently are, over the Farallon Islands and the existing ASBS. There would be no establishment of SWPZs. Therefore, no impact on flights would occur in the existing sanctuary and minor adverse impacts on flight patterns would occur in the expansion area due to the introduction of flight restrictions over the four ASBS along the coast. As with the proposed action, these restricted areas are relatively small and would not substantially alter flight patterns in the area. The impact is minor and less than significant.

Research and Education and Passive Economic Use

There are no differences between this alternative and the proposed action with regard to recreation, education and passive economic use.

Arena Cove Boundary Alternative

Any development or recreational uses within the inner cove would be subject to the sanctuary regulations — either regulations outlined for the proposed action or regulations for the existing GFNMS. If this alternative was implemented with the proposed action regulations, the several existing moorings in the cove would be subject to permits or authorization and other facilities such as docks or piers would require permits or authorizations as well, as described for the proposed action. Recreational uses such as fireworks, which would be a prohibited discharge into the sanctuary, could be allowed through the authorization process; fireworks displays may also be eligible for special use permits. Also, recreational vessels would not be allowed to discharge in the inner cove other than the discharges allowed in the proposed action regulations. If this alternative was implemented with the existing regulations, prohibited activities would be just that — there would be no regulation establishing the authorization process to allow certain otherwise prohibited uses, unless the use was eligible for a special use permit. Given the limited amount of development in Arena Cove, implementation of this boundary alternative is considered a less than significant adverse impact on land use and development and recreation-tourism uses in the cove. No differences in impacts on education and research, or passive use would occur under this alternative.

MPWC Zones Alternative

The differences in this alternative with regard to socioeconomic resources relates only to recreational use of MPWC. Under this alternative, the proposed MPWC zones would be slightly adjusted. The minor differences in the designated MPWC zones would not change the findings of the impact analysis for the proposed action.

4.7 Offshore Energy

This section addresses offshore energy development, including oil and gas exploration and energy producing facilities, and alternative energy producing facilities.

4.7.1 Regional Overview of Affected Environment

The study area for this topic includes the proposed sanctuary expansion area, as well as the existing CBNMS and GFNMS. At present, there are no existing, planned or reasonably foreseeable offshore energy development projects within the study area.

Oil and Gas Development Potential

The federal Bureau of Ocean Energy Management (BOEM) indicates that oil and gas resources exist offshore California in the central and northern California regions. There are portions of two designated oil and gas basins within the proposed expansion area — the Point Arena basin and Bodega basin (see Figure 4.7-1). According to BOEM (BOEM 2013), about 10 percent of the Point Arena Basin and about one-third of the Bodega Basin are included in the expansion area, with the remaining portions of the Bodega Basin covered by existing sanctuaries to the south. BOEM estimates that the entire Point Arena basin contains about 2.0 billion barrels of oil and 2.1 trillion cubic feet of natural gas and the Bodega Basin contains approximately 1.4 billion barrels of oil and 1.5 trillion cubic feet of natural gas. Therefore, the amount of reserves underlying the proposed sanctuary boundaries (assuming even distribution of resources throughout the basin) would be 200 million barrels of oil and 210 billion cubic feet of natural gas in Point Arena Basin and 466 million barrels of oil and 500 billion cubic feet of natural gas in the Bodega Basin.

Offshore oil and gas development in State waters (3 miles from shore) is permanently prohibited by State legislation (see regulatory overview) so there is no potential for oil and gas facilities to occur in State waters of the proposed expansion area. Much of the U.S. Outer Continental Shelf (OCS) has seen little exploration and production of oil and gas, in fact there have been no exploration wells drilled in either of the basins within the study area of this EIS. Therefore, estimates of undiscovered technically recoverable reserves (UTRR) along the Atlantic Coast, much of the Pacific Coast, and coastal Alaska carry significant uncertainties. BOEM attempts to acquire geophysical exploration data (primarily seismic data) along these coasts, and purchases data to the degree they are available and if possible within their budget, but good data are difficult to acquire and much of the existing data are old. Typically, initial estimates of UTRR change, sometimes dramatically, as the quantity and quality of data improve as exploration progresses. Therefore, caution must be exercised when attempting to forecast future production and resulting revenues from the OCS (Marc et al 2010).

There are no current oil and gas leases in the proposed expansion area and no current plans to develop leases in this area. The oil and gas basins within the study area have not been included in recent federal leasing plans (see regulatory overview).

Alternative Energy Development

BOEM has received indications of interest in renewable energy projects on the OCS off of Washington, Oregon, and California (both deepwater wind as well as marine hydrokinetic [wave] energy); however, no lease requests have been received (BOEM 2013a) for California. The wind and wave resource data

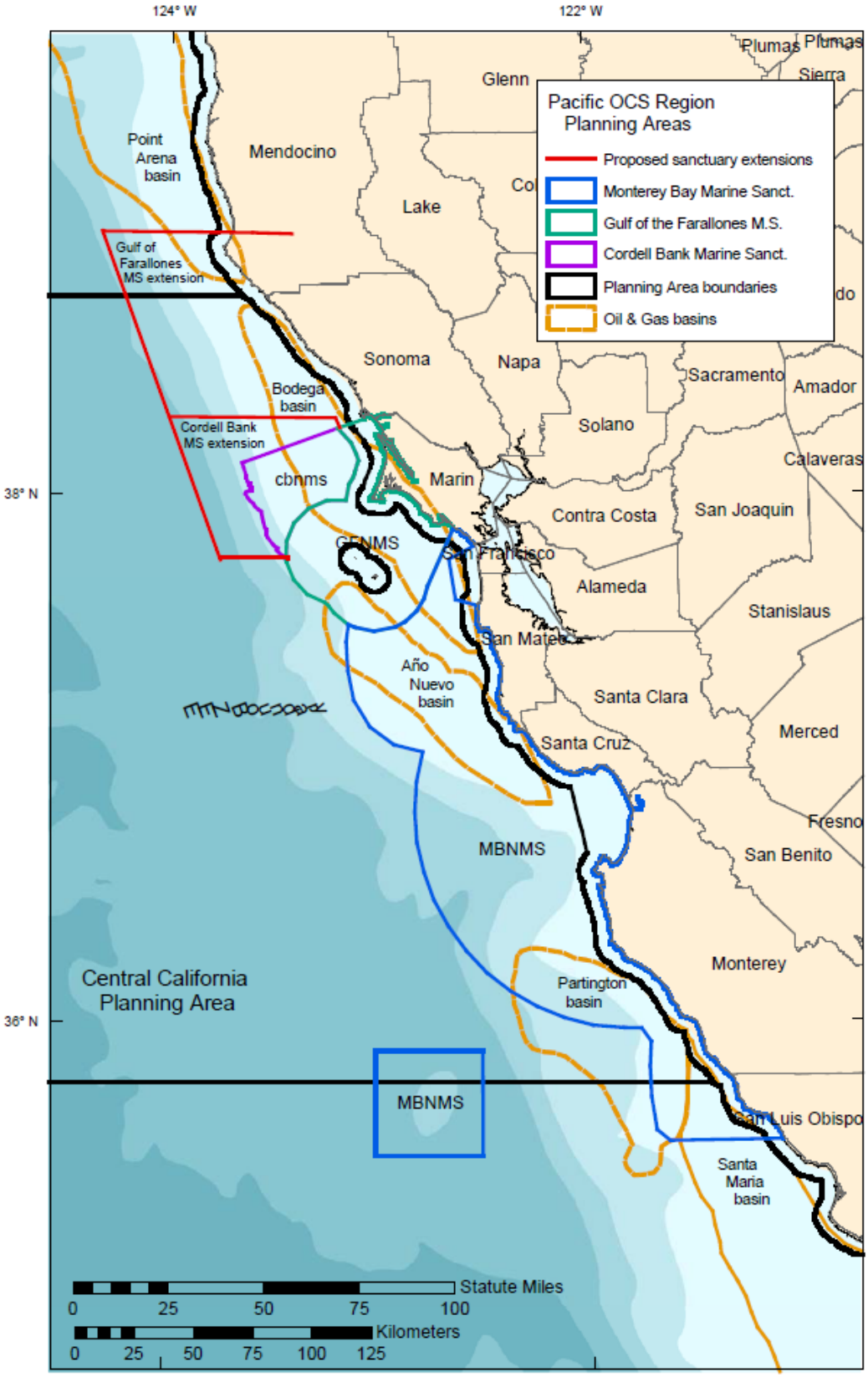

Figure 4.7 1. Oil Basins in Study Area (BOEM 2013)

provided and referenced in BOEM's scoping comments indicate the presence of high winds and waves in the proposed expansion area, but this information does not necessarily indicate that there is strong resource development potential there. There are numerous factors affecting the siting of alternative energy development, including but not limited to availability of infrastructure, access to the resource, existing surrounding uses, shoreline and nearshore conditions and presence of sensitive natural resources.

A Sonoma County Water Agency (SCWA) staff member indicated that the Sonoma county coastline has very dense wave energy, which represents a good condition for hydrokinetic energy development (Stillman 2013). SCWA initiated a hydrokinetic feasibility study at four coastal locations in Sonoma County in 2009. The Federal Energy Regulatory Commission (FERC) granted three preliminary permits to SCWA for investigation of developing two to five megawatts (MW) of wave power at each location and to assess the potential for expansion to over 40 MW at each of the three sites. The permits were limited to studies related to determining the feasibility of wave energy; no land disturbance was authorized in the permits.

The three locations included areas of 10 to 15 sq miles along the coast north of the Russian River Estuary, each extending from one half mile to about 3 miles offshore. SCWA worked with interest groups to select these locations based on their avoidance of marine protected areas implemented under the State's Marine Life Protection Act, known fishing and crabbing areas, and other sensitive areas. Due to funding limitations, SCWA was unable to continue the project and FERC rescinded the preliminary permits in 2011 (SCWA 2013).

4.7.2 Regulatory Overview

Offshore Oil and Gas

Offshore oil and gas development in federal waters is governed by BOEM, which is within the U.S. Department of Interior. BOEM manages offshore oil and gas leases and is responsible for administering the provisions of the OCS Lands Act regarding oil and gas development on the OCS. BOEM is authorized to prepare and implement five-year plans which identify federal waters to be opened for offshore oil and gas exploration and development. The BOEM five-year plan for 2012-2017 does not include plans for leasing tracts offshore California. Areas off the Pacific coast are not included in the 2012-2017 proposed program (BOEM 2013b), "which seeks to accommodate the recommendations of governors of coastal states and of state and local agencies — an important priority established by the OCS Lands Act. The exclusion of the Pacific Coast is consistent with state interests, as framed in an agreement that the governors of California, Washington and Oregon signed in 2006, which expressed their opposition to oil and gas development off their coasts."

In addition to BOEM provisions, offshore oil and gas exploration, development and production facilities are subject to compliance with numerous federal laws such as (but not limited to):

- National Environmental Policy Act
- Endangered Species Act
- Coastal Zone Management Act
- Federal Water Pollution Control Act
- Ports and Water Safety Act

- Marine Mammal Protection Act
- Clean Air Act
- National Historic Preservation Act
- Oil Pollution Act and
- Federal Oil and Gas Royalty Management Act.

Offshore oil and gas development within State waters is governed by the California State Lands Commission (CSLC), which stopped leasing of new offshore tracts after the Santa Barbara oil spill in 1969. The California legislature codified the ban on new leases in 1994 when it approved the California Coastal Sanctuary Act. The California Coastal Commission and other State agencies would have regulatory authority over any proposal to lease and ultimately develop oil and gas resources within State waters. Local governments would also have regulatory authority over onshore facilities necessary and dependent on offshore oil and gas development.

Federal approval of new leases offshore California on the OCS was halted in 1982. Starting in 1990, there was a series of Presidential Executive Orders that gave these dormant leases two "red lights" followed by a "green light." President George H.W. Bush banned new federal offshore oil leasing from 1990 to 2000, including in California. In 1998, President Bill Clinton extended this moratorium through 2012. However, in July 2008, President George W. Bush rescinded the executive order. On December 1, 2010, President Barack Obama issued an executive order banning oil leasing in the Gulf of Mexico and off both the Atlantic and Pacific coasts for five years. In summary, NOAA does not expect upcoming oil and gas development in the proposed expansion area in the foreseeable future.

Alternative Energy

There are both federal and State regulations and permitting agencies governing the development of offshore alternative energy projects.

Ocean Thermal Energy Conversion Act, 42 U.S.C. § 9101 et seq.

With regard to alternative energy sources from the ocean, the Ocean Thermal Energy Conversion (OTEC) Act of 1980 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 thermal energy conversion development. 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 thermal energy operations, prevent pollution of the marine environment, clean up any discharged pollutants, prevent or minimize any adverse impacts from thermal energy facility construction and operation, and ensure that the thermal plume of a plant does not unreasonably impinge on and thus degrade the thermal gradient used by any other thermal energy 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 offshore thermal energy conversion plants. Although there are no existing large scale OTEC facilities worldwide, several pilot projects are being planned in other parts of the world (e.g. China). Tropical regions are considered the primary viable locations for OTEC plants due to the greater temperature differential between the shallow and deep water. It is

unlikely that OTEC energy development is reasonably foreseeable in the proposed sanctuary expansion area.

Energy Policy Act of 2005

The Energy Policy Act of 2005 addresses offshore renewable energy and alternative uses of outer continental shelf (OCS) oil and gas facilities. The Act amends the OCS Lands Act (OCSLA) to authorize the U.S. Department of the Interior (DOI) to act as lead federal agency for certain alternative energy and marine-related uses on the OCS; in the study area, the most likely alternative offshore energy projects covered by this Act are wind or wave generating facilities. The DOI delegated OCSLA authority to DOI's Minerals Management Service (now BOEM). The Act states that the Secretary of the Interior may grant a lease, easement, or right-of-way on the OCS for activities that: support production of energy from sources other than oil and gas; support exploration, production, storage, and transportation of oil and gas; or use OCSLA-authorized facilities for other purposes.

The Energy Policy Act of 2005 precludes BOEM from issuing leases, easements, and rights-of-way for renewable energy projects in a national marine sanctuary. BOEM's regulations essentially restate the Energy Policy Act of 2005. 30 CFR 585.204 states "BOEM may offer any appropriately platted area of the OCS, as provided in § 585.205, for a renewable energy lease, except any area within the exterior boundaries of any unit of the National Park System, National Wildlife Refuge System, National Marine Sanctuary System, or any National Monument."

While they only pertain to marine and hydrokinetic energy development (MHK),[16] the BOEM/FERC Guidelines on Regulation of Marine and Hydrokinetic Energy Projects on the OCS state, "neither BOEM, through its leasing authority, nor FERC, through its licensing authority, can approve a project in a National Park or a National Monument located on the OCS. For BOEM, the same restriction applies to National Marine Sanctuaries and National Wildlife Refuges located on the OCS" (BOEM 2012). Therefore, BOEM has no authority to approve such projects within national marine sanctuaries. Depending on the individual authorization, FERC may be authorized to approve MHK licenses without a BOEM lease in national marine sanctuaries. Unless the applicant is a federal agency with congressional authorization, MHK applicants generally must have a FERC license to operate on the OCS.

Office of Renewable Energy Programs

Within BOEM, the Office of Renewable Energy Programs (OREP) oversees development of offshore renewable energy projects on the OCS. This relatively new activity in the marine environment requires an assessment of the potential environmental impacts on resources on the OCS. The Bureau's responsibilities include determining and evaluating the effects of OCS activities on natural, historical, and human resources and the appropriate monitoring and mitigating of those effects.

[16] Marine and hydrokinetic energy encompasses ocean thermal energy conversion (OTEC), which falls under the jurisdiction of NOAA. However, the BOEM guidelines uses the term only as it applies to technologies under BOEM's leasing responsibility primarily referring to wave, tidal and ocean current technologies (BOEM 2012).

State Alternative Energy Regulations

Alternative energy projects in State waters would be subject to regulations and approvals established by the CSLC and California Coastal Commission, plus any onshore facilities would require approvals from local jurisdictions. In addition, offshore energy projects in State waters would likely require approval from numerous other resource and permitting agencies, including CDFW, USCG and FERC (license to tie-in to the onshore electrical transmission grid).

Recently enacted legislation (SBX2-Simitian, Chapter 1, Statutes of 2011) establishes a State policy goal of producing 33 percent of California's electrical needs with renewable energy resources by December 31, 2020. The goal applies to all electricity retailers in the state. A substantial number of renewable energy projects are required to meet this directive, as well as to achieve the State's climate change goal of reducing greenhouse gases in the atmosphere to 80 percent of 1990 levels by 2050, as set forth in Executive order #S-3-05, signed June 1, 2005 by then Governor Schwarzenegger.

CSLC staff from the Environmental Planning, Land Management, Mineral Resource Management, and Legal Divisions formed an interdivisional planning team (the "Alternative Energy Program") in December 2011 in order to more effectively coordinate Commission activities related to renewable/alternative energy projects. CSLC staff members also participate in the Ocean Protection Council's Marine Renewable Energy Working Group, which is working to solve the environmental and logistical challenges associated with development of offshore wave, tidal, and wind energy (CSLC 2012). There are no pending applications for development of offshore renewable energy at this time.

4.7.3 Impact Assessment Methodology

This section assesses potential impacts on offshore energy exploration and development. Since there is no existing or proposed energy development in the study area, the analysis includes evaluation of potential impacts on future energy development. Making significance determinations on future impacts would be speculative at this time, given uncertainties about energy resource development potential.

4.7.4 Environmental Consequences

Any alternative that involves the incorporation of the proposed expansion area within the sanctuaries' boundaries would result in a prohibition of exploration for, or development of oil, gas and mineral resources within that area, consistent with existing CBNMS and GFNMS regulations that prohibit such activities and facilities. Generally speaking, alternative energy development requiring alteration of the submerged lands or discharges in the sanctuary would not be allowed unless authorized or permitted by NOAA, subject to terms and conditions established in the sanctuary regulations.

Proposed Action

Implementation of proposed sanctuary regulations would prohibit all oil and gas exploration and development. This new prohibition would mainly apply to federal waters, as oil and gas development has been permanently banned in State waters by State legislation. There are no existing oil and gas facilities, no active leases and no plans to develop OCS oil and gas reserves. Therefore, compared to existing conditions, the proposed action would have no adverse impact.

Looking at impacts on future development potential, in total, the amount of oil and gas resources underlying the proposed expansion area, as estimated by BOEM, is slightly less than 700 million barrels of oil and 700 billion cubic feet of natural gas. This includes 0.466 billion (466 million) barrels of oil and 0.5 trillion (500 billion) cubic feet of natural gas in the Bodega Basin and about 200 million barrels of oil and 200 billion cubic feet of natural gas in Point Arena Basin. These estimates do not include portions of both basins that are located in State waters, where oil and gas development is already prohibited. Also, these estimates do not factor in technological limitations on fully extracting the entire amount of oil and gas. In addition, these assessments are based on conditional estimates and more reliable estimates of the amount and value of oil and gas resources cannot be determined until drilling occurs. The overall estimated quantity of oil and gas that would be precluded from development is not considered substantial by NOAA, compared to existing total U.S. reserves, especially given the recent projections that increased the overall amount of reserves available for future development. BOEM estimates that the total OCS UTRR are 88.59 billion barrels of oil and 398.37 trillion cubic feet of gas (BOEM 2013c). Using BOEM's estimates, the precluded area within the expanded boundaries of the sanctuaries represents 0.0079 of the total OCS oil reserves and 0.0012 of total gas reserves in the U.S. NOAA considers this loss less than significant particularly since there is no indication that these reserves would be considered for active energy production in the future.

The proposed action would eliminate the existing provision in the GFNMS regulations that allows oil and gas pipelines from oil and gas development adjacent to the sanctuary. However, there are no existing or proposed oil and gas facilities near the sanctuary. Therefore, this proposed change does not result in any adverse impact on oil and gas development.

Regarding alternative energy, it would be speculative to attempt to estimate the potential for alternative energy development, as no studies have been completed or proposals made in the expansion area. The proposed action would result in several changes in the way future alternative energy projects are permitted or authorized in the expansion area as well as the existing sanctuaries:

- As mentioned in the regulatory overview, BOEM does not have authority to approve hydrokinetic projects within national marine sanctuaries so development in federal waters of the expansion area would no longer be under the jurisdiction of BOEM.
- Although the proposed action does not contain regulations specific to alternative energy development, the proposed regulations prohibit most discharges into the sanctuary and prohibit alteration of submerged lands, consistent with existing sanctuary regulations. Alternative energy projects in the expansion area (and throughout the sanctuaries) would be subject to these regulations. However, under the proposed authorization provision, alternative energy projects involving alteration of submerged lands or prohibited discharges could be approved in both the existing sanctuaries and proposed expansion area. In that case, the potential impacts of the alternative energy project would be analyzed under NEPA in a separate public process.
- Existing CBNMS and GFNMS regulations do not have an authorization provision, so there is no mechanism at this time to allow alternative energy projects involving discharges or alteration of submerged lands within the boundaries of the existing sanctuaries. By adding the authorization provision to the regulations of both sanctuaries, more area would be available for alternative energy projects than is currently available. Therefore, the net adverse impact on alternative energy would be negligible.

As stated in the regulatory setting, any future alternative energy projects would be subject to approvals from numerous agencies, depending on location and jurisdiction. Other than the change in BOEM jurisdiction, regulatory agencies with existing authority over alternative energy projects would continue to have such authority within the sanctuaries' boundaries. Environmental protection offered by both the sanctuary regulations and resource agency regulations would continue to apply to alternative energy development.

No Action Alternative

Under the No Action alternative, offshore energy development would continue to be regulated by existing State and federal requirements. Alternative energy projects within coastal onshore areas would also be regulated by local jurisdictions. No impact on offshore energy development would result from the No Action alternative.

Existing Regulations Alternative

The regulations regarding oil and gas prohibitions would be the same as the proposed action, except that oil and gas transmission pipelines would be allowed in GFNMS under certain conditions. This would have the potential to accommodate pipelines from oil and gas facilities outside of the sanctuary boundaries. However, no oil and gas development projects exist in the ocean offshore central or northern California and none are proposed.

It is possible that alternative energy projects could obtain sanctuary permits, as described for the proposed action. Alternative energy development would be prohibited if facilities would alter the submerged lands or would have discharges or deposits of substances prohibited by sanctuary regulations. There would be no authorization provision to allow projects that alter the seabed or have discharges. Therefore, there may be an adverse impact on alternative energy development, although there are no current proposals for such facilities in the proposed expansion area.

Arena Cove Boundary Alternative

There is no difference in impacts on oil and gas development between this alternative and the proposed action. The area to be included in the sanctuary boundary under this alternative is within the jurisdiction of the State, where oil and gas development is permanently banned. There is no potential for oil and gas development to occur there. For alternative energy, if the existing regulations were applied, projects that would alter the submerged lands or would have discharges or deposits of substances would be prohibited. If the proposed action regulations were applied, the authorization process would provide a mechanism to approve such facilities. Given the small area of the cove and the presence of other harbor uses, the preclusion of alternative energy projects at this location would result in a very minor adverse impact.

MPWC Zones Alternative

This sub-alternative regards MPWC boundaries and as such, could be implemented with either the proposed action or existing regulations alternative. The impacts of regulations under these two alternatives are described above. There would be no differences in impacts regarding energy development.

4.8 Marine Transportation

This section summarizes existing marine transportation activities in the region, including commercial cargo vessels and cruise ships. Commercial fishing, recreational fishing and boating, and homeland security and military transportation are addressed separately in Sections 4.4, 4.6 and 4.9. The impact analysis presents the standards used to evaluate impacts on marine transportation and addresses potential effects of the proposed action and alternatives on vessel transportation activities. The study area for the marine transportation analysis includes the waters from Bodega Bay to Point Arena. In addition, implementation of proposed sanctuary regulations would affect vessel discharges occurring outside of the study area that flow into the expanded sanctuary area.

4.8.1 Regional Overview of Affected Environment

Since Spain first began sailing the Pacific Ocean in the 1500s, the history of the development of California's north-central coastal economy has been influenced by the maritime industry. Ocean-based commerce and industries are important to the maritime history, the modern economy, and the social character of this region.

In 2012, 7,450 vessels transited the shipping lanes into and out of San Francisco Bay (Table 4.8-1). Figure 4.8-1 depicts the designated Vessel Traffic Service (VTS) area and vessel transit patterns of the Traffic Separation Scheme (TSS) offshore of San Francisco outside San Francisco Bay. See Section 4.8.2 for additional details on the VTS.

Since the study area is located north of San Francisco Bay, the statistics for vessels transiting to the north are of particular interest for this analysis. In 2012, a total of 1,966 transits occurred in the northern traffic lane (Table 4.8-1).

Table 4.8-1. Summary of Vessel Transits in and out of San Francisco Bay

	IN				OUT				Grand Totals
Year	North	South	West	Total	North	South	West	Total	
2005 Total	1,092	1,798	1,346	4,236	1,721	1,124	1,397	4,242	8,478
2006 Total	1,118	2,086	1,371	4,575	1,901	1,276	1,407	4,584	9,159
2007 Total	1,061	2,136	1,330	4,527	1,857	1,121	1,504	4,482	9,009
2008 Total	950	2,095	1,442	4,487	1,851	1,077	1,519	4,447	8,934
2009 Total	728	1,898	1,496	4,122	1,580	702	1,823	4,105	8,227
2010 Total	687	1,634	1,743	4,064	1,088	413	2,404	3,905	7,969
2011 Total	646	1504	1925	4055	1032	370	2492	3894	7,949
2012 Total	701	1364	1700	3765	1265	400	2020	3685	7450
Grand Total	6983	14515	12353	33831	12295	6483	14566	33344	67175

Source: USCG unpublished data, Automatic Identification System Vessel Traffic Service (USCG 2013).

California ports handled an estimated 700 cruise ship port calls in 2012. The Port of San Francisco experienced steady gains in cruise ship traffic, from 44 calls and 56,968 passengers in 1994 to 65 calls and 195,000 passengers in 2012 (SFPORT 2013). Itineraries from San Francisco include round trip cruises to Alaska and Mexico.

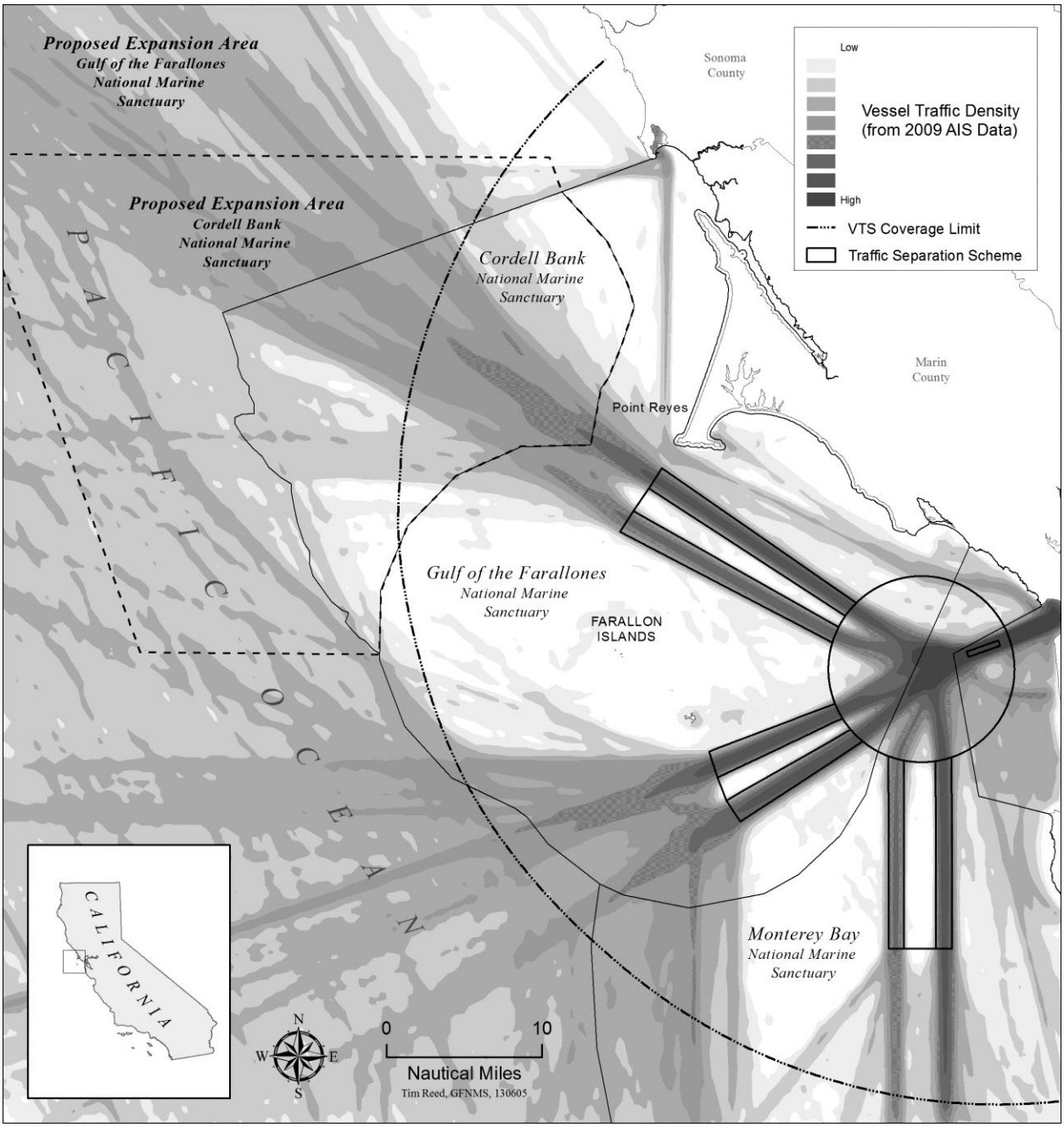

Figure 4.8-1. Marine Transportation – VTS Area

Vessel traffic patterns in and out of San Francisco Bay, including all vessels over 300 gross tons, which includes tugs, tanker ships, cruise ships, container vessels, military craft and research vessels. *Source:* USCG unpublished data, Automatic Identification System, Vessel Traffic Service (USCG 2013).

Using the Automatic Identification System (AIS) data (NAVCEN 2013), staff at the NOAA Southwest Fisheries Science Center analyzed vessel traffic density offshore of north central California for 2009, including waters of the study area. Vessel traffic density was analyzed as the number of kilometers traveled by vessels per square kilometer (km^2) block. The vessels included were cargo vessels, large passenger ships, and tankers, all greater than 328 feet (100 meters) in length. The data revealed that cargo vessels

usually travel more than 23 miles (20 nm) offshore within the study area. There were between 10 and 25 cargo vessels per km^2 that traveled within 11.5 miles (10 nm) of Point Arena in 2009. Large passenger vessels transited within 13.8 miles (12 nm) of shore with the vessel density being 5–15 per km^2. The majority of tankers transited greater than 46 miles (40 nm) from shore with a density of 8–15 vessels per km^2 within 15 nm from Bodega Head.

Figure 4.8-2. Large vessels such as cruise ships and cargo vessels have the potential to directly impact marine mammals. *Photo: Bob Wilson.*

Vessel spills are a major concern when considering potential threats to the area. The potential impacts could be enormous given the number and volume of vessels and the sensitivity of resources in the area. In addition to oil tankers, large cargo vessels are a concern because in addition to their cargo they can carry up to one million gallons of bunker fuel for vessel propulsion, a heavy, viscous fuel similar to crude oil.

In late 1984, on-board explosions about 8 miles (6.9 nm) seaward of the Golden Gate Bridge disabled the tanker *Puerto Rican*. The vessel broke apart and discharged refined oil products within the boundary of Gulf of the Farallones National Marine Sanctuary. Thousands of seabirds were oiled and died.

In November 2007, the container ship *Cosco Busan* collided with the Bay Bridge within San Francisco Bay, spilling 58,000 gallons of bunker fuel that spread throughout the Bay and into coastal waters. Oil from the spill traveled over 25 miles (21.7 nm) and reached beaches in MBNMS and GFNMS. Wildlife impacted from the spill included thousands of seabirds that were oiled and killed (Oiled Wildlife Care Network, unpublished data). There have been numerous vessel spill incidents within GFNMS since the establishment of the sanctuary. These two incidents are examples of the multiple spills that occurred across a 30--year period; they demonstrate the seriousness of the potential hazards to this area from vessel spills, including spills from accidents that occur outside sanctuary boundaries. Sunken vessels residing on the seafloor have the potential to leak oil or other contaminants into the area. The rocky mainland coast in Sonoma and Mendocino Counties has historically provided hazardous navigational obstacles to shipping. Many known shipwrecks litter the seafloor in this region; see Section 4.5 (Cultural and Maritime Heritage Resources).

In addition to the threat of materials being deposited from vessels into the sanctuary, vessels themselves can directly affect various sanctuary resources. Vessels can potentially alter the behavior of marine mammals and seabirds, changing the distribution of the animals or the amount of time that they spend feeding and/or resting. Vessels also injure or kill marine mammals through collisions. In the fall of 2007, there were at least three blue whale deaths off the coast of southern California that were attributed to ship strikes (Santa Barbara Museum of Natural History 2013). Similar suspected whale ship strikes occurred in 2010, when two blue, one humpback and two fin whales were found dead off the coast of northern California.

4.8.2 Regulatory Overview

Regulations that apply to vessel traffic offshore California are summarized in this section. Additional regulations related to vessel discharges and marine water quality are described in Section 4.2 (Physical Resources) under Water Quality.

Federal Regulations

Several acts of Congress govern the movements of commercial vessels in specified waterways. These acts include the Ports and Waterways Safety Act of 1972, the Port and Tanker Safety Act of 1978, and the Oil Pollution Act of 1990. In addition, the U.S. Coast Guard VTS regulations became effective October 1994. The VTS San Francisco Area includes the Pacific Ocean in a 38 nm (43.7 miles) radius around Mount Tamalpais, which is 10 miles north of the Golden Gate.

Ports and Waterways Safety Act (PWSA) of 1972

The PWSA of 1972 authorizes the USCG to establish vessel traffic service/separation (VTSS) schemes 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 or more. The Oil Pollution Act of 1990 amended PWSA to mandate that appropriate vessels comply with VTSSs. Two categories of vessels are defined in 33 CFR 161 – VTS Users and Vessel Movement Reporting System (VMRS) Users, each with specific requirements. In 2010, the USCG initiated a Port Access Route Study on modifying the traffic lanes for the San Francisco TSS. The United Nations International Maritime Organization (IMO), subsequently adopted the USCG recommended lane modifications and amended the San Francisco TSS, effective on June, 1 2013. The modification of the lanes was done in collaboration with NOAA. The intention of this effort was to increase the safety of navigation of vessels while reducing the co-occurrence of vessels and whales, in order to reduce the incidence of whale strikes. Only a small portion of the expansion area is within the USCG VTS area as delineated by the dashed line in Figure 4.8-1.[17]

Port and Tanker Safety Act of 1978

The Port and Tanker Safety Act of 1978 provided broader regulatory authority over regulated and non-regulated areas. The Act improved the supervision and control of all types of vessels operating in navigable waters of the U.S., and improved the safety of foreign or domestic tankers that transport or transfer oil or hazardous cargoes in ports or places subject to U.S. jurisdiction.

Oil Pollution Act of 1990

The Oil Pollution Act of 1990 established that parties responsible for discharging oil from a vessel or facility are liable for: (1) certain specified damages resulting from the discharged oil; and (2) removal costs incurred in a manner consistent with the National Contingency Plan (NCP). The liability for tankers larger than 3,000 gross tons was increased to $1,200 per gross ton or $10 million, whichever is greater. The fine for failing to notify the appropriate Federal agency of a discharge was increased from a maximum of $10,000 to a maximum of $250,000 for an individual or $500,000 for an organization, and the maximum

[17] The USCG VTS has an official area of jurisdiction that extends 38 nm in an arc around the Mt. Tamalpais transmission station. However, USCG can often transmit to a much larger distance so they will communicate with vessels that are in the expansion area, but vessels are not required to check in with VTS until they enter the 38-nm line.

prison term was increased from one year to five years. Civil penalties were authorized at $25,000 for each day of violation or $1,000 per barrel of oil discharged, and failure to comply with a Federal removal order can result in civil penalties of up to $25,000 for each day of violation (USEPA 2005).

State Regulations

California Ocean-Going Fuel Regulation

The California Air Resources Board (CARB) Ocean-Going Vessel (OGV) Fuel regulation is aimed at reducing emissions from ocean going vessels by requiring low-sulfur fuels to be used within 24 nm (about 28 miles) of the California coastline. As a result of this rule, the relative volume of vessel traffic has moved farther offshore and has resulted in a higher percentage of vessels now using the western approach to San Francisco. The U.S. Environmental Protection Agency Emissions Control Area (ECA) amendment to MARPOL Annex VI fuel consumption will overtake the California OGV Fuel regulation in 2015 (see http://www.arb.ca.gov/ports/marinevess/documents/marinenote2012_1.pdf and http://www.epa.gov/OMS/oceanvessels.htm). Although other factors may influence traffic patterns, expectations are that vessel traffic in 2015 will return to historic patterns similar to those observed prior to the introduction of the CARB rule, resulting in relatively even distribution among the three lanes.

4.8.3 Impact Assessment Methodology

The proposed action would result in a significant impact on marine transportation if its implementation would result in any of the following:

- Spillage of oil or other hazardous materials into the waters of the study area;
- Displacement of vessels in harbors within the study area; or
- Substantial delay of commercial vessel traffic.

The analysis includes an assessment of commercial shipping, which includes both domestic and foreign passenger vessels, such as cruise ships, dry cargo freighters, and tankers.

Data for the above were obtained from NOAA, California Department of Boating and Waterways, and other government agencies.

In the following analysis, the use of the terms “nautical miles” and “miles” depends on the jurisdiction and regulatory authority. Some regulations refer to nautical miles, while other regulations simply refer to miles, which is assumed to be statute miles. The same applies to the use of the terms “gross registered tons” and “gross tons” because the existing regulations vary in their references.

4.8.4 Environmental Consequences

None of the alternatives would result in significant impacts on marine transportation, as documented in the following subsections.

Proposed Action

The specific relevant proposed action regulatory prohibitions that have the potential to affect marine transportation in the sanctuary expansion area relate to discharge or deposit of matter or materials within the sanctuaries and from beyond the boundary of the sanctuaries (when subsequently, a sanctuary resource or quality is injured), introduction or release of introduced species, operation of any vessel engaged in the trade of carrying cargo within an area extending one nm from a designated Special Wildlife Protection Zone (SWPZ), desertion of a vessel aground, at anchor, or adrift and leaving harmful matter on deserted vessels in GFNMS; and abandoning any structure, matter or material on the submerged lands of CBNMS and GFNMS. However, the effects on marine transportation operations would be minor and less than significant. The proposed action would not result in any increased risk of spillage of oil or other hazardous materials, displacement of vessels in harbors, or delay of commercial traffic.

Discharge Regulations

The proposed regulations prohibiting discharges of matter and material into the expansion area would result in a minor adverse impact on marine transportation. Current State and federal regulations limit different types of discharges into the waters of the expansion area so the addition of the sanctuary regulations represents an incremental increase in restrictions on vessel discharges. Discharge regulations affect sewage and other materials associated with vessel operations.

Excluding cruise ships, it is prohibited in CBNMS and GFNMS and would be prohibited in the expansion area to discharge or deposit any matter or material from vessels within or into sanctuary waters. The exceptions to this prohibition are:

- Fish, fish parts, chumming materials or bait used in lawful fishing activities;
- Clean effluent generated incidental to vessel use by an operable, approved Type I or II marine sanitation device (MSD) (applies to vessels less than 300 gross registered tons (GRT) or vessels 300 GRT or greater without sufficient capacity to hold sewage while in a sanctuary);
- Clean: vessel deck wash down, vessel engine cooling water, vessel generator cooling water, and bilge water;
- Anchor wash; or
- Vessel engine or generator exhaust.

In addition, the proposed action includes a regulatory change for both CBNMS and GFNMS, to add an exception to the existing discharge prohibition to allow discharge of clean graywater, as defined by section 312 of the Clean Water Act (CWA) (galley, bath, and shower water), from vessels less than 300 GRT and from vessels 300 GRT or greater without sufficient capacity to hold graywater within the sanctuaries.

Cruise ships are currently prohibited by sanctuary regulations from discharging or depositing material or matter in CBNMS and GFNMS and the same prohibition would apply to the expansion area. The exceptions for cruise ships, as listed below, are more limited than the exceptions for other vessels:

- Clean: vessel engine cooling water, vessel generator cooling water, and bilge water;
- Vessel engine or generator exhaust; or
- Anchor wash.

For all vessel types, it would be prohibited in the expansion area to discharge or deposit any material or other matter that subsequently enters the sanctuaries and injures a sanctuary resource or quality. The above-described exceptions for discharges of matter or material also apply to this prohibition. The following discussion summarizes existing regulations applicable to the expansion area and implications of the proposed discharge regulations.

Sewage

Currently, in the expansion area, as described in Section 4.2 (Physical Resources), the USEPA established a No Discharge Zone (NDZ) for marine waters within 3 miles of the coastline (the territorial sea, as defined in the CWA), prohibiting discharge of treated and untreated sewage from: all large passenger vessels of 300 gross tons or greater and large oceangoing vessels of 300 gross tons or greater with available holding tank capacity or containing sewage generated while the vessel was outside of State waters (USEPA 2012). Section 312 of the CWA (33 U.S.C. § 1322) requires the use of MSDs for all vessels within 3 miles of the coast if equipped with an installed toilet. Vessels 65 feet (20 meters) and under may use a Type I, II, or III MSD. Vessels over 65 feet in length must have a Type II or Type III MSD. Smaller vessels may have MSDs (but are not required to), or may have portable toilets, portable sewage receptacles, or no toilet facilities. Beyond 3 miles from the coast, under current federal regulations, vessels may discharge treated or untreated sewage from any type of MSD. Discharge of untreated sewage throughout the sanctuaries would be prohibited under the regulations of the proposed action.

Implementation of the proposed action would mean, excepting cruise ships, vessels transiting sanctuary waters beyond 3 miles of the coastline with installed toilets could discharge clean effluent (sewage) generated incidental to vessel use by a Type I or Type II MSD, or hold the waste in a Type III MSD (required for vessels 300 GRT and above with capacity to hold the waste). The combination of the proposed action regulation and existing law (see above) would mean that vessels over 65 feet could only discharge through a Type II MSD. Vessel operators would be required to lock all MSDs in a manner that prevents discharge or deposit of untreated sewage. Cruise ships would be prohibited from discharging sewage in the expansion area without exception. In addition to sanctuary regulations, discharges within 3 miles of shore would be restricted by existing federal regulations (described above). Aside from discharge of sewage outside sanctuary boundaries, discharge into a mobile or shore pumpout or other onshore sewage disposal facility would be an option for the waste from smaller vessels, when the facilities have the capacity to accept their volume of waste; typically pumpout services cannot serve large vessels due to their size and limited pumpout equipment and tank capacities. Should a vessel owner or operator choose to install an MSD, there would be one-time costs for purchase of the device and installation, and periodic costs for maintenance. Should a pumpout facility be used, there could be a cost each time to pump sewage from the vessel. Due to these factors, the proposed action has the potential to cause some adverse socioeconomic effects. While it is not possible due to lack of data to estimate the number of vessels engaged in marine transportation that would choose to engage in these options, the number is expected to be limited because the majority of vessels engaging in marine transportation in the expansion area already

have installed toilets and MSDs. Therefore, the proposed action is expected to result in a minor, less than significant impact on the marine transportation industry.

For vessels that would hold the waste while in the expansion area, transit time in the area would be a factor. Cruise ships and other large commercial vessels would already be expending the fuel necessary to travel through the expansion area on the way to their destinations outside it. Under normal circumstances, they would incur no additional fuel costs, would move through the expansion area in a few hours, and would have the capacity to hold sewage during that time. Smaller vessels spending time in the area rather than transiting through it, including vessels engaged in research, would either discharge waste through an approved Type I or II MSD, or hold the waste, so little impact is expected on that type of vessel. Vessels travelling through existing national marine sanctuaries off the coast of California as well as through the expansion area would either hold their waste for the incremental amount of time it would take to transit the expansion area, or would discharge the waste in allowed areas outside of national marine sanctuary boundaries. Overall, the impact on marine transportation from the prohibitions on sewage discharge is expected to be less than significant.

Other Material

The proposed discharge regulations would affect vessel discharge of other matter in the expansion area, including, but not limited to, graywater, bilge water, and solid waste.

Graywater is a category of discharge covered by a Vessel General Permit (VGP),[18] which applies only to the territorial sea (3 miles from shore) within the expansion area. "Large passenger vessel and cruise ship graywater discharges are prohibited in State waters" under the VGP, and graywater discharges (including graywater mixed with sewage) from oceangoing vessels of 300 gross tons with sufficient holding capacity are prohibited in State waters.[19] Vessels greater than 400 gross tons with sufficient holding capacity may not currently discharge graywater within one nm from shore when they regularly travel farther than that from shore unless they meet treatment standards and other requirements of the VGP. Vessels that do not regularly travel more than one nm from shore are required to minimize discharge of graywater. In addition,

[18] Effective December 19, 2013, the existing NPDES VGP, administered by the USEPA, will be reissued and will replace the former VGP. As of that date, all vessels (except recreational vessels and vessels of the Armed Forces of the U.S.) are eligible for coverage under the VGP. Waters of the U.S. are subject to the VGP and include the territorial seas as defined in the CWA section 502(8) — 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. The types of vessels covered under the VGP include commercial fishing vessels, cruise ships, ferries, barges, mobile offshore drilling units, oil tankers or petroleum tankers, bulk carriers, cargo ships, container ships, other cargo freighters, refrigerant ships, research vessels, emergency response vessels, including firefighting and police vessels, and any other vessels operating in a capacity as a means of transportation. Effluent streams eligible for coverage under the VGP: deck washdown and runoff, bilge water, ballast water, and numerous other specific effluents. As of December 8, 2011, a small Vessel General Permit (sVGP) has been proposed by the USEPA (but not finalized as of August 2013), to cover all vessels (except recreational and armed forces vessels) less than 79 feet in length.

[19] This is one of the several California-specific VGP requirements; for these vessels, any co-mingling of black water (sewage) and graywater waste streams are considered graywater. Another California-specific VGP requirement is "Vessel discharges shall comply with all requirements and discharge prohibitions set forth in the California Clean Coast Act of 2005 (Auth. Pub. Resources Code, § 72400 et seq. This condition cannot be made less stringent without violating the requirements of State law, including water quality standards.).

vessels with a VGP may not discharge graywater within the portion of a national marine sanctuary where the VGP applies (within 3 miles of the shore). There are other State-specific VGP requirements; the California requirements are described in Section 6.4 of the VGP.

The proposed regulation would prohibit cruise ships from discharging all graywater. It would also prohibit discharge of graywater that does not meet the definition of clean from vessels less than 300 GRT and from vessels 300 GRT or greater without sufficient capacity to hold graywater in the proposed expansion area. Since many vessels enter and exit the San Francisco Bay, allowing discharge of clean graywater in CBNMS and GFNMS would avoid the potential for a large number of vessels entering or exiting the bay to have to concentrate their graywater discharges in the small area where it would be allowed outside of MBNMS boundaries per VGP requirements.[20] Some vessels might still discharge in that area, but would have the other options as provided by the regulatory exception for clean graywater.

Cruise ships and other large commercial vessels would already be expending the fuel necessary to transit the expansion area within a few hours, and would have the capacity to hold the prohibited graywater during that time or discharge it according to the standards. For smaller marine transportation vessels, clean graywater could be discharged in the expansion area or their holding tank capacity could be upgraded so that non-clean graywater could be held until discharge could be made outside sanctuary boundaries or into a pumpout or other wastewater reception facility. Should a vessel owner or operator choose to upgrade holding capacity, there would be one-time costs for purchase of the equipment and installation, and periodic costs for maintenance. Should a reception facility be used, there would be a cost each time to pump the graywater from the vessel. Due to these factors, the proposed action has the potential to have some adverse socioeconomic effects on vessel operations. It is not possible due to lack of data to estimate the number of vessels engaged in marine transportation that would choose to engage in the equipment upgrade or reception facility options, but since most large vessels transiting the expansion area already have holding tanks installed, the proposed action is expected to result in a minor, less than significant impact on the marine transportation industry.

As per the Oil Pollution Act, the CWA and USCG regulations, bilge water may not currently be discharged by vessels in the expansion area when the bilge water has an oil content greater than 15 parts per million and the vessel is within 12 nm (14 miles) of land; or bilge water has an oil content greater than 100 ppm and the vessel is beyond 12 nm of land. Cruise ships and other ships of 300 gross tons or more may not release oily bilge water within State waters.

The proposed regulations would prohibit cruise ships from discharging bilge water in the expansion area, and would allow clean bilge water discharge from other vessels in the expansion area. While data are not available on the amount and types of bilge water currently discharged in the expansion area, it is not expected that the impact of the proposed regulation would be significant. Vessel owners and operators already comply with the regulatory regime for discharging pollutants and strive to maintain clean bilge water; it is expected they could refrain from discharging any non-clean bilge water and that cruise ships could refrain from discharging any bilge water while in the expansion area.

[20] This area is sometimes called the “exclusion area” or “donut hole”, since it is not currently a part of MBNMS.

Solid waste is another type of discharge from vessels that occurs in the expansion area. Discharge of plastics in the expansion area is currently prohibited, so there would be no additional impact on the marine transportation industry from the proposed regulations regarding plastic discharge. Under the Act to Prevent Pollution from Ships as modified by MARPOL 73/78, vessels may currently discharge garbage ground to pieces under an inch in the proposed expansion area beyond 3 nm from land and unground garbage beyond 12 nm from land.

The proposed regulations would prohibit these discharges throughout the expansion area. Vessels would be required to store food and other waste generated while transiting through the expansion area. The amount of waste generated by commercial vessels other than cruise ships is small in volume, and cruise ships have on-board equipment that reduce the volume of food waste so it may be more easily stored. The amount of food waste generated by marine transportation vessels during transit of the expansion area would likely not impact the ability of the vessels to store it and discharge it once outside the sanctuary, beyond 3 nm from shore (ground garbage) or 12 nm from shore (unground garbage). Vessel owners could take measures to reduce on-board waste streams or upgrade storage facilities if additional capacity was needed, which could involve changes to vessel waste generation practices, one-time equipment purchase costs, and maintenance costs. These factors have the potential to cause some adverse effects on vessel owners or operators, impossible to estimate due to lack of data, but since most large vessels transiting the expansion area already have some waste storage capacity, the proposed action is expected to result in a minor, less than significant impact on the marine transportation industry.

Vessels travelling through existing national marine sanctuaries off the coast of California and the expansion area would hold graywater, bilge water, solid wastes and other types of prohibited materials for the incremental amount of time it would take to transit the expansion area, upgrade waste holding facilities, change waste generation practices or discharge the materials where allowed by the regulatory regime. Overall, though there is some potential for adverse socioeconomic effects related to changing waste management equipment or practices, the impacts on marine transportation regarding discharges or deposits of matter or materials are expected to be less than significant.

Introduced Species Regulations

As described in the water quality regulatory setting in Section 4.2.2, the ballast water management regime in inland and offshore waters of California is managed by the CSLC, the USCG, and the USEPA. Ballast water may contain introduced species. In all waters of the expansion area, vessels currently have the option to retain all ballast water on board or take up or exchange/discharge ballast water if in compliance with the ballast water management regime for this region.

Within the expansion area, besides the option of retaining ballast water, vessel operators may currently follow USCG and CSLC regulations and policies regarding ballast water, which extend up to 200 nm from the land in the Pacific Coast Region. According to the CSLC's Marine Invasive Species Program, ballast water management applies to vessels over 300 gross registered tons capable of carrying ballast water. They may use an environmentally sound method of ballast water management approved before the vessel begins the voyage, by the CSLC or USCG as being at least as effective in removing or killing nonindigenous species using mid-ocean waters. Ballast water taken on within the Pacific Coast Region may also be exchanged in near-coastal waters (waters more than 50 nm from land and at least 657 feet

[200 m] deep) or may discharge it at the same port or place (within one nm of the berth or breakwater) where the ballast water originated. Vessels arriving from outside the Pacific Coast Region may also discharge ballast water at the same location it was taken on if not mixed with ballast water taken on in an area other than mid-ocean waters. In extraordinary circumstances, where compliance with approved options is not practicable, ballast water may be exchanged within an area agreed to by the CSLC in consultation with the USCG. The CSLC advises that owners, operators and persons in charge of vessels must follow best management practices to minimize the release of nonindigenous species into waters of the State, including minimizing discharge and uptake in marine sanctuaries. The other ballast water discharge option allowed by the CSLC and USCG are not applicable to the expansion area: discharge it to an approved reception facility (none approved in California); and, for vessels arriving from a port outside the Pacific Coast Region, exchange it more than 200 nm from land in waters and at least 6,562 feet (2,000 m) deep (outside the expansion area).

Ballast water discharge would be prohibited in the expansion area (as well as the existing sanctuaries, as it is currently prohibited). As part of the proposed action, vessels would have to retain ballast water until outside sanctuary boundaries. NOAA regulations prohibit releasing introduced species (with exception of a few species as described in the regulations) and prohibit discharging ballast water into CBNMS and GFNMS waters. The prohibitions do not apply to activities necessary to respond to an emergency threatening life, property, or the environment, so the proposed action would not prevent vessels from discharging ballast water in such an emergency. In addition, the VGP has a provision regarding avoiding ballast water uptake and discharge into national marine sanctuaries; it would apply to all vessels (except recreational vessels and vessels of the Armed Forces of the U.S.) equipped with ballast water tanks in waters subject to VGP.

Prohibiting the discharge of introduced species via ballast water in the proposed expansion area does not represent a substantial operational change for ballast water management because most vessels subject to ballast water regulations already normally discharge ballast water outside the expansion area. As described above, vessels arriving to a California port from within the Pacific Coast Region and transiting the expansion area would be required to retain ballast water or exchange it in waters more than 50 nm from land, which is outside the expansion area. Vessels arriving to a California port from outside the Pacific Coast Region and transiting the expansion area would retain ballast water, exchange it more than 200 nm from land, or discharge it at the California port, place or berth where the ballast water was loaded. Vessels arriving from both areas may also use an alternative, environmentally sound CSLC or USCG approved ballast water treatment method. Some vessels coming into San Francisco Bay ports are known to discharge ballast water within the territorial waters of the San Francisco-Pacifica Expansion Area. Because the expansion area is not an area where ballast water uptake, exchange, or discharge normally occurs, the impact on vessel operations to prevent introduction of introduced species via ballast water discharge would be minor and less than significant.

Cargo Vessels Regulation

As part of the proposed action, in GFNMS, vessels carrying cargo would not be able to operate within one nm from any designated Special Wildlife Protection Zone (SWPZ) (proposed cargo vessel prohibition zones are depicted in Figure 3.2-10). This prohibition would not apply to vessels transporting people or supplies to the Farallon Islands or mainland areas adjacent to GFNMS and would not limit access to

fishing, recreational, or research vessels. Within the proposed expansion area, there would be two cargo vessel prohibition zones along the shoreline, and within the existing GFNMS, there would be five cargo vessel prohibition zones, all along mainland or island shorelines.

Proposed SWPZs 3 through 7 within the existing sanctuary boundaries would completely or partially overlap existing ASBS boundaries where the current GFNMS regulations prohibit cargo vessels within 2 nm. The two proposed SWPZs in the expansion area are on the coast near Fort Ross and Gualala (SWPZs 1 and 2 in Figure 3.2-10).

Cargo vessels do not typically frequent the areas around the proposed SWPZs since the areas are adjacent to shorelines that are not close to any cargo delivery or pick up ports. Under existing GFNMS regulations, these vessels are already are prohibited from operating within one nm from the Farallon Islands, Bolinas Lagoon, and ASBS within GFNMS, which are generally the same areas as the five proposed SWPZs. Except when transiting to and from scheduled ports of call, cargo vessel operations almost always occur well offshore to avoid risks of accidents or groundings that might result in damage to the vessel, other vessels or facilities, or marine resources. Proposed SWPZ 1 and SWPZ 2 are proposed to be larger than the other proposed SWPZs due to the value of those coastlines for wildlife, particularly seabirds and marine mammals. Cargo vessels typically do not operate in or near the proposed SWPZs and ASBS, so there would be less than significant impacts from the proposed action on cargo vessel operations or traffic patterns.

Deserted Vessels Regulation

It is currently illegal for abandoned vessels to “trespass” on submerged lands under the California State Lands Commission’s jurisdiction (in the expansion area, from the mean high tide to 3 nm offshore). It is also illegal to abandon barges greater than 100 gross tons on the navigable waters of the United States per the Abandoned Barge Act of 1992, but there is currently no comparable federal law for other vessels.

Under the proposed action, the GFNMS regulation prohibiting vessel desertion would mean no owner, operator, or person in charge could desert a vessel within the expansion area. Vessels could not be deserted while aground, adrift or at anchor. In addition, no harmful matter could be left aboard a grounded or deserted vessel; this could lead to a prohibited discharge or deposit of harmful material or matter from the untended vessel. Among other provisions on deserting a vessel, the GFNMS regulations state a vessel may not be left aground or adrift or be discovered to be aground or adrift without notification to the Director of the ONMS within 12 hours; the Director must also be presented with a preliminary salvage plan within 24 hours of the notification. The potential for a vessel at anchor to ground or discharge or deposit materials, when the vessel is not secured in a timely manner, is another factor for considering a vessel deserted.

There is no specific proposed prohibition against deserting a vessel or leaving harmful matter aboard a deserted vessel in CBNMS; because of the offshore nature of CBNMS there is no risk of a vessel running aground and little risk of it remaining for a lengthy period of time adrift on the surface within the boundaries of the sanctuary, since winds or currents would likely cause a vessel abandoned afloat to drift outside the sanctuary boundaries within a matter of hours. Under the proposed action, CBNMS regulations prohibiting abandoning any structure or material on the submerged lands would be extended to the expansion area. (This same regulation is proposed for GFNMS, in addition to the vessel desertion regulation.) Also, the

existing discharge prohibitions would apply to harmful matter discharged or deposited from an abandoned vessel, within the waters and on the submerged lands of both CBNMS and GFNMS.

The proposed regulations might have some minor adverse impacts on the marine transportation industry, as they would place an additional economic burden on vessel owners/responsible parties to ensure that capsized, sunken, or otherwise incapacitated vessels in the expansion area be salvaged rather than abandoned and to ensure that any hazardous substances are removed from grounded or abandoned vessels. The intent of the regulations is to ensure that vessel owners take responsibility for their vessels before damage to sanctuary resources and habitats can occur or worsen. The financial impact of fines or penalties on a responsible party found to have abandoned a vessel could be small or large, due to such factors as the nature of the deserted vessel, if it contained hazardous substances, and impacts from the vessel on sanctuary resources. It is far less expensive for vessel owners to salvage their incapacitated vessels than to pay fines, fees, costs associated with response, damage assessment, and restoration activities should a vessel ground on shore and cause damage to sanctuary resources. While this might be an immediate burden for vessel owners, the overall risk of an individual boat being abandoned is expected to be relatively small, and the impact on marine transportation as a whole is expected to be minor and less than significant.

To summarize the impacts on marine transportation from the proposed action, there might be some immediate, adverse, less than significant impacts from activities related to MSD equipment installation and maintenance and salvage. Impacts resulting from the other discharge and introduced species prohibitions in the expansion area are also expected to be less than significant. There would be little, if any, adverse impact on cargo vessel operations. Impacts on the industry as a whole from the proposed action are expected to be less than significant.

No Action Alternative

Under the No Action alternative, marine transportation would continue to be managed within the proposed expansion area as it is currently managed under federal and State laws, since there would be no expansion. In the existing GFNMS, SWPZs would not be established and the existing regulation regarding operation of cargo vessels near the Farallon Islands, Bolinas Lagoon and ASBS would remain in place. No impacts on marine transportation would occur under the No Action alternative.

Existing Regulations Alternative

The regulations on most discharges, introduced species and vessel desertion in this alternative are the same as the proposed action and would have the same effects on marine transportation as described for the proposed action. This alternative would have two differences relevant to marine transportation: graywater discharge would be prohibited from all vessels; and cargo vessels would be prohibited from operating within 2 nm of existing ASBS in the expansion area (instead of the proposed SWPZs). These differences are discussed in the following subsections.

This alternative would not result in any increased risk of spillage of oil or other hazardous materials in the expansion area, displacement of vessels in harbors, or delay of commercial traffic.

Discharge Regulations

Under the existing regulations alternative, there would be no exception for clean graywater discharges from vessels, so vessels would need to hold graywater while transiting the expansion area. For vessels with sufficient holding capacity, there would be no impact. For vessels without sufficient holding capacity, vessel owners would need to consider equipment upgrades to hold graywater until discharge could be made outside the sanctuaries or into a reception facility, which has the potential to result in adverse impacts from equipment installation and maintenance.

Most of the marine transportation vessels transiting the expansion are large vessels, and most are expected to be able to hold the graywater or travel outside sanctuary boundaries to discharge it, so the overall impact on the marine transportation industry is expected to be less than significant.

Cargo Vessel Regulation

In this alternative, the SWPZs would not be established. Therefore, rather than establishing cargo vessel restriction areas around SWPZs, the existing GFNMS regulation requiring cargo vessels to operate outside 2 nm from an ASBS, would continue in force and would be applied to the four ASBS in the GFNMS expansion area. No changes would occur to the existing configuration of cargo vessel restriction areas within the existing sanctuary boundaries. (see Figure 3.4-1 in Chapter 3, Description of Proposed Action and Alternatives). The following ASBS would be covered by the regulation: Farallon Islands, Duxbury Reef, Double Point, Point Reyes Headlands, Bird Rock, Bodega, Gerstle Cove, Del Mar Landing and Saunders Reef.

Within the expansion area, while vessels would be required to operate outside of 2 nm from the ASBS, this is expected to result in little impact on cargo vessel operations or traffic patterns since these vessels typically transit farther than 2 nm from the coastline. There would be no impact on cargo vessel operations within the existing GFNMS, and minor, less than significant impacts on cargo vessel operations due to avoiding ASBS in the expansion area.

In summary, there might be some adverse, less than significant impacts from activities related to equipment installation and maintenance for holding sewage, graywater or other prohibited wastes on vessels while in the expansion area or to discharge the wastes to a reception facility, but overall, the impact on marine transportation from this alternative would be less than significant.

Arena Cove Boundary Alternative

This boundary alternative could be implemented with either the proposed action or the existing regulations alternative. The only difference in this alternative is that all of Arena Cove would be included within the expanded GFNMS, so sanctuary regulations would apply to all of Arena Cove rather than excluding the existing pier and waters east (shoreward) of the pier. The regulation covering cargo vessel traffic near designated SWPZs (proposed action) or ASBS (existing regulations) would not apply in this area, as no SWPZs are proposed for Arena Cove and no ASBS currently exist there. This alternative would result in a less than significant impact on marine transportation, similar to the proposed action.

Including all of Arena Cove within the GFNMS boundary would mean that vessels throughout the cove would be subject to the prohibitions on discharges or deposits of materials, introduction or release of intro-

duced species, and vessel desertion. The vessels that primarily use Arena Cove are fishing and recreational vessels (see Sections 4.4 and 4.6). While historically the cove was used by commercial vessels (e.g., for timber and other goods and services), there is now little, if any, use of the cove by vessels transporting goods or engaged in research activities.

Since the additional Arena Cove area is relatively small and there is little, if any, use of the additional area by the types of vessels discussed in this section, the impacts of this alternative on marine transportation would be almost the same as for the proposed action or existing regulations alternative. Any adverse impact would be minor and less than significant for the marine transportation industry overall. This alternative would not result in any increased risk of spillage of oil or other hazardous materials in the expansion area, displacement of vessels in harbors, or delay of commercial traffic.

MPWC Zones Alternative

Compared to the proposed action, this alternative would establish slightly different boundaries for the MPWC zones. Since this alternative only affects the areas of use of MPWC, there would be no new or different impact on marine transportation beyond what was identified for the proposed action. Impacts on recreational MPWC use are addressed in Section 4.6 (Socioeconomic Resources, Human Uses, and Environmental Justice).

4.9 Homeland Security and Military Uses

This section addresses uses within the expansion area and nearby areas by the U.S. Coast Guard (USCG), part of the U.S. Department of Homeland Security (DHS), and the Army, Air Force, and Navy, part of the U.S. Department of Defense (DOD).

4.9.1 Regional Overview of Affected Environment

Homeland security and military uses in the study area include USCG missions and training; U.S. Army ammunition transportation; U.S. Air Force airlift, spacelift, defense, and training operations; and transit by and training of U.S. Navy vessels and aircraft.

DHS (USCG)

The DHS is responsible for investigation and law enforcement services for a variety of homeland security issues in nine component agencies. One of those agencies, the USCG, is the most active federal maritime law enforcement agency and military presence in the study area. It is one of the five armed forces of the United States. The USCG fulfills maritime security, safety and stewardship missions. In accordance with Commandant instructions 16004.3A (COMDTINST 2003), the USCG supports national marine sanctuary management by providing routine surveillance, and dedicated law enforcement of the national marine sanctuaries concurrently with other Coast Guard operations. USCG activities consist of:

- homeland security, nearshore search and rescue operations;
- training exercises;
- regulatory enforcement, including environmental, fishery management, pollution prevention and oil spill response serving as the federal on-scene coordinator for marine spills) and other maritime regulations;
- vessel traffic management;
- drug interdiction; and
- deepwater environment activities, which are usually located more than 50 miles (43 nm) offshore.

Of the 12 active USCG stations positioned along the California Coast within the Pacific Area Command, the stations that conduct operations in the proposed expansion area are Bodega Bay and Noyo River. One station that historically had been active in the study area, Station Arena Cove, was closed and transferred to the Navy in 1958; the Point Arena lighthouse was automated in 1977. Both facilities are now privately owned. Station Bodega Bay's area of responsibility extends about 58 miles (50 nm) offshore and along approximately 65 miles of coastline from the northern boundary of the Gualala River to the southern boundary at Point Reyes. Station Noyo River's area of responsibility is from Point Delgada to the Gualala River and up to 58 miles (50 nm) offshore. Station Bodega Bay has 47-foot Motor Life Boats and 25-foot response boats used to service their area of responsibility. Part of Coast Guard Sector San Francisco, District Eleven, Pacific Area and co-located with Station Bodega Bay is the USCG Cutter *Sockeye*. The *Sockeye* is an 87-foot Coastal Patrol Boat providing search and rescue, law enforcement, environmental protection, and homeland security functions. Crew of the *Sockeye* have an area of responsibility that stretches from Mendocino County to Point Sur and out to 230 miles (200 nm) offshore. This expansive area includes the busy San Francisco Bay and Port of Oakland (USCG 2013).

The USCG also has air stations near the study area including Air Station San Francisco located at the San Francisco International Airport. Air Station San Francisco currently operates four MH65C helicopters that provide search and rescue coverage along 300 miles of coastline from Point Conception to Fort Bragg 24 hours a day. In addition to search and rescue, the air station patrols ports, waterways and provides coastal security, protects living marine resources, and enforces federal and international laws and regulations. Air Station Sacramento, located at the north end of McClellan Air Force Base, operates 5 HH-130 Hercules Fixed-Wing Aircraft that service the study area. Coverage spans the Eastern Pacific Area including the west coast of the United States, areas west of Canada, and south along the Baja California coast. Air Station Sacramento missions include search and rescue, marine environmental protection, federal law enforcement, drug interdiction patrols, and transportation for the Pacific Strike Team, which is the USCG's oil spill prevention and containment team.

The USCG has four additional facilities that service the study area: Communications Area Master Station Pacific (CAMSPAC) at Point Reyes, the USCG Training Center (TRACEN) in Petaluma, Base Alameda on Coast Guard Island in San Francisco Bay, and Sector San Francisco services on Yerba Buena Island in San Francisco Bay. CAMPSAC delivers accurate long range and deployable communication services to the USCG, maritime public, and other government agencies. These unique capabilities are vital to safety of life at sea, national security, and commerce in the maritime domain. TRACEN Petaluma is the USCG's largest west coast training center; it is adjacent to the study area and services operation specialists that work in the region. Coast Guard Island is home to USCG District Eleven, which encompasses the states of California, Arizona, Nevada, and Utah, and includes the coastal and offshore waters out to a thousand miles and the offshore waters of Mexico and Central America down to South America. In addition to numerous facilities, the island's center operates one 378-foot long "high endurance" cutter, and three 418-foot national security cutters that service the study area. In addition to USCG enlisted and civilian employees, the USCG is assisted by members of the Coast Guard Auxiliary, a non-profit organization that assists the USCG in its missions (with the exception of military and direct law enforcement missions). There are two Coast Guard Auxiliary units (called "flotillas") in close proximity to the proposed expansion area in District Eleven, Flotilla 5-5 in Sonoma County and Flotilla 8-7 in Mendocino County (USCG 2013).

As part of its training missions, the USCG conducts air use of force, surface use of force, and search and rescue activities in the study area; weapons and pyrotechnics are a part of the training, and some vessels have limited sewage holding capacity, requiring discharge every 24 to 48 hours (Schultz 2013). Within the expansion area and the existing CBNMS and GFNMS, USCG is not currently conducting any use-of-force training (either by vessel or aircraft) or any search and rescue training activities. Proposed future training areas are within the existing GFNMS and the area excluded from MBNMS, offshore of San Francisco and northern San Mateo Counties (not currently included within national marine sanctuary boundaries) (Delaney 2013).

DOD

In addition to DHS's USCG activities, there are several DOD component agencies that conduct operations in the study area.

U.S. Army

The U.S. Army operates the Military Ocean Terminal Concord (MOTCO), a general cargo and ammunition marine terminal, distribution hub and DOD cargo customs clearance center located in the eastern San Francisco Bay Area (U.S. Army 2013a). This facility of over 6,700 acres is operated by the U.S. Army's 834th Transportation Battalion of the Army's Surface Deployment and Distribution Command. MOTCO has three ocean terminal piers (with only one currently functional); it receives ammunition by rail and highway (MilitaryBases.US [Army] 2013 and U.S. Army 2013b). MOTCO enables the DOD Operations Plan for the Pacific Rim and has the capability to serve as a strategic launch platform for the West Coast (MilitaryBases.US 2013a). While MOTCO does not operate in the study area, materials being shipped to and from MOTCO pass through it.

The U.S. Army Corps of Engineers' regulatory jurisdiction for all uses in the expansion area (not limited to military uses) is the territorial sea, extending from the coastline seaward a distance of 3 nm (33 C.F.R. 329.12). See Section 4.6.2 (Socioeconomic Resources, Human Uses, and Environmental Justice – Regulatory Overview) for a discussion of uses and activities subject to U.S. Army Corps regulations.

U.S. Air Force (USAF)

The USAF operates Travis Air Force Base (AFB) in California's Central Valley, one of the largest air mobility organizations in the USAF (MyBaseGuide.com 2013). Travis AFB serves over 127,500 (active duty and reservists, military family members, civilians, and retirees and family members (Military Bases.US 2013b). The USAF conducts practice missions over the Pacific and has acknowledged aircraft going down offshore, including an unmanned experimental aircraft X-51A Waverider that suffered control failure while attempting to fly at six times the speed of sound and crashed in the Pacific offshore of Southern California in 2012 (CBS News 2013). In addition, the proposed expansion area encompasses existing Department of Defense Operating Areas (OP AREAS) utilized by the 30th Space Wing located at Vandenberg AFB, California. The 30th Space Wing conducts spacelift operations, intercontinental ballistic missile testing, missile defense and aircraft operations. Vehicles launched from the air, over the Pacific Ocean, have historically occurred south of the expansion area; however, future mission scenarios can be envisioned where the footprint of air-launched vehicles could extend into the proposed expansion area (Cortopassi 2013). Air launches are conducted by the USAF's Pegasus Program, of which the majority are for NASA missions and approximately 10% are for commercial purposes. Between 2008 and 2012 there was one air launch. The maximum size of material that could potentially be deposited into the study area as part of an air launch is 30 feet (Cortopassi 2013a), for any dimension, width or length.

U.S. Navy

Despite the closure of Navy bases in the San Francisco Bay area, the Navy still conducts operations within or near the study area. Airspace over the study area is used by the Navy for training. The Navy's Third Fleet, home-ported in San Diego, conducts surface, air, and submarine maneuvers. The Federal Aviation Administration (FAA) has approved Special Use Airspace designations for Navy and Marine Corps flights. The Navy maintains the following two warning areas in and around the current boundaries of the CBNMS and GFNMS, including parts of the proposed expansion area.

- Warning Area 260 (W-260): a special-use airspace over open-ocean located off the California coast north of the San Francisco Bay area beginning approximately 81 miles (70 nm) northwest of the previous

Naval Air Station Moffett Field. The airspace extends from the ocean surface up to 60,000 feet (18,288 meters). W-260 is used for all-weather flight training, air intercepts, surface operations, air-to-surface bombing, and rocket and aerial gunnery exercises with conventional ordnance. No ordnance expenditures are authorized within 9.2 miles (8 nm) of Cordell Bank (38°01'N, 123°25'W) (Slates 2013).

- Warning Area 513 (W-513): a special-use airspace over open-ocean located off the California coast located west of the San Francisco Bay area. It is bounded to the north by W-260 and begins approximately 61 miles (55 nm) northwest of the former Naval Air Station Moffett Field. The warning area extends from the ocean bottom up to 60,000 feet (18,288 meters). W-513 is used for flight training, air intercepts, and surface operations with inert conventional ordnances (Slates 2013).

Approximately one-quarter of the United States Fleet is stationed in San Diego, including three aircraft carriers. In addition two aircraft carriers and numerous submarines and other ships are stationed in the Pacific Northwest. Surface ships and submarines routinely transit through the waters of the study area. During these transits, they engage in unit level training onboard and operate within the requirements of the Federal Water Pollution Control Act section 312 and associated federal regulations (Slates 2013). Navy activities associated with Surveillance Towed Array Sensor System Low Frequency Active (SURTASS LFA) Sonar do not currently take place in the study area, but may be planned for the study area in the future and are addressed in Section 4.9.4 (Environmental Consequences).

4.9.2 Regulatory Overview

Homeland security and military uses of the study area are subject to federal regulations such as the Clean Water Act (CWA), the Act to Prevent Pollution from Ships (APPS) and MARPOL (the International Convention for the Prevention of Pollution of Ships) 73/78, Marine Mammal Protection Act (MMPA), Endangered Species Act (ESA) and Federal Aviation Administration (FAA). See Section 4.3.2 (Biological Resources – Regulatory Overview) for information on the MMPA and ESA.

Section 4.2 (Physical Resources – Regulatory Overview) provides summary information for water quality regulations applicable to most types of vessels. Additional information applicable to USCG and military vessels is provided below.

Clean Water Act (CWA)

USCG and military vessels are included in the CWA definition of "vessels of the Armed Forces of the United States."[21] The Vessel General Permit (VGP) does not apply to vessels of the Armed Forces of the United States. The No Discharge Zone (NDZ) offshore of California also does not apply to homeland security and military vessels.

Section 312(n) of the CWA, added in 1996, requires the EPA and DOD to identify and evaluate discharges of Armed Forces vessels to determine which discharges require control for protection of the environment and to set standards for those discharges. While not in effect yet, EPA and DOD, in consultation with the

[21] Section 312(a)(14) of the CWA states, "vessel of the Armed Forces" means – (A) any vessel owned or operated by the Department of Defense, other than a time or voyage chartered vessel; and (B) any vessel owned or operated by the Department of Transportation that is designated by the Secretary of the department in which the Coast Guard is operating as a vessel equivalent to a vessel described in subparagraph (A).

USCG, have been working on pollution control standards to apply to most U.S. Armed Forces vessels, called the Uniform National Discharge Standards. These will be standards for the required use of marine pollution control devices (MPCD) to control discharges incidental to the normal operation of an armed forces vessel, and will apply out to 12 nm from the coastline (USEPA 2013).

APPS and MARPOL 73/78

The U.S. Code regarding ships subject to preventive measures in APPS (33 USC Section 1902 et seq.) include exemptions for armed forces ships owned or operated by the USCG and military departments that the Secretary of the relevant department determines cannot fully comply with specified discharge requirements because compliance is not technologically feasible or would impair the ships' operations or operational capability.

The Secretary of the Navy is required to develop and support technologies and practices for solid waste management aboard ships owned or operated by the Department of the Navy, including technologies and practices for the reduction of the waste stream generated aboard such ships. APPS includes provisions for plastic collection, storage and disposal aboard Navy ships with plastic processors. There are exceptions for Navy ships for security, the safety of a ship, personnel health, and lifesaving, but otherwise, there are prohibitions for discharge of buoyant garbage or plastic from Navy submersibles, for discharge from Navy surface ships of plastic contaminated by food during the last three days before the ship enters port and for plastic except that contaminated by food during the last twenty days before the ship enters port. The President of the U.S. also has authority to make waivers of up to one year from specified requirements when in the paramount interest of the U.S.

USCG Vessel Environmental Manual

The USCG Vessel Environmental Manual (USCG 2007) describes environmental policies and procedures applicable to all USCG waterborne assets. It is intended to meet the requirement of 33 U.S.C. 1902(g), noncommercial shipping standards, for federal departments and agencies to prescribe pollution standards for their ships that ensure actions are consistent with MARPOL, so far as reasonable and practicable without impairing the operations or operational capabilities of the ships. The discharge requirements in the manual for USCG vessels are summarized as follows:

- U.S. Contiguous Zone (3-12 nm): Sewage and graywater discharge allowed.
- Designated "no discharge" zones: No discharge of bilges and oily waste.
- U.S. Internal Waters and Territorial Seas (0-3 nm) and U.S. Contiguous Zone (3-12 nm): Use of oily water separators highly discouraged. If used, report use and particulars. No sheen allowed. Discharge must be through oily water separators and oily content monitors and contain less than 15 ppm of oil. Preferred method is to pump to shore facility.
- U.S. Contiguous Zone greater than 12 nm [to 24 nm]: Discharge must be through oily water separators and oil content monitors and contain less than 15 ppm of oil.
- For all vessels except fixed or floating platforms and associated vessels —

- Plastics: Disposal prohibited.
- Dunnage, lining and packing materials that float: Disposal prohibited less than 25 miles from nearest land and in the navigable waters of the U.S.
- Food waste, paper, rags, glass, metal bottles, crockery and similar refuse (unground): Disposal prohibited less than 12 miles from land and in the navigable waters of the U.S. If ground to pieces less than one inch, prohibited less than 3 miles from the nearest land.
- Mixed garbage types: When garbage is mixed with other harmful substances having different disposal or discharge requirements, the more stringent disposal restrictions shall apply.

■ For fixed or floating platforms and associated vessels: Disposal of plastics, dunnage, food waste and mixed garbage types is prohibited in all waters, except for food waste ground less than an inch, for which disposal is prohibited less than 12 miles from land and in the navigable waters of the U.S.

Regulations on Vessels Owned or Operated by the DOD

The DOD publication, "Regulations on Vessels Owned or Operated by the Department of Defense" (Department of Defense 2005) implements Section 312(d) of the Clean Water Act by issuing standards for marine sanitation devices (MSDs) for DOD vessels. It also implements MARPOL 73/78, in accordance with the requirements of Section 3(g) of the APPS, by prescribing standards under DOD vessels should prevent oil pollution. The regulations also contain standards for design construction, and use of MSDs and other equipment.

The DOD directs DOD ships to adhere to the provisions of the Clean Water Act, the APPS and MARPOL and recognized international standards, with certain exemptions. For MSD use, the regulations describe exemption for vessels transiting, conducting or taking part in military operations and exercises and training, under repair, and at anchor in the navigable waters and territorial seas of the United States that are incapable of holding total vessel-generated sewage onboard. The regulations note vessels are to limit sewage discharge into U.S. navigable waters, territorial seas, and NDZs to the maximum extent practicable without endangering the health, safety, or welfare of the crew or other personnel aboard.

For oil pollution prevention, DOD ships that would need to deviate from their military characteristics, effectiveness, and system integrity in a way that was not in the interest of national security could be exempted to allow otherwise prohibited activities. Examples include discharge of oily bilge and oily waste (containing only distillate), when oily waste processing equipment is malfunctioning or the oil/water separating system is unable to be used, 50 nm or more from land, or to prevent machinery damage. Operational standards for oil pollution prevention that apply when a vessel is not exempted are described in the regulations. One example is discharges, regardless of oil content, that produce a sheen are prohibited within the territorial seas (0-3 nm) and contiguous zone (3-12 nm). Another example is DOD ships operating in the territorial seas and contiguous zone may process bilge water and discharge the effluent wastewater.

4.9.3 Impact Assessment Methodology

The proposed action would result in a significant impact on homeland security or military uses if its implementation would result in substantial restrictions on existing operations. Impacts on military and

homeland security uses were assessed based on review of existing and planned operations and how they might be affected by application of proposed sanctuary regulations in the expanded boundary area. The proposed regulations that may affect homeland security and military uses are the same as existing regulations for the two sanctuaries. Therefore, no new adverse impacts would occur in the existing sanctuaries; the focus of the analysis is on the proposed sanctuary expansion area.

4.9.4 Environmental Consequences

While the alternatives would result in some potential changes in DHS (USCG) and military operations, impacts on homeland security and military uses are expected to be less than significant, as documented in the following subsections.

Proposed Action

In the proposed sanctuary expansion area, all DOD activities essential for national defense conducted at the time expansion takes effect would be exempt from the prohibitions listed in the proposed regulations; consultation prior to sanctuary expansion would be undertaken to make this determination. In the expanded CBNMS area, additional DOD activities initiated after the effective date of expansion necessary for national defense would be exempted after consultation between the Department of Commerce and DOD; activities not necessary for national defense would be subject to the regulatory prohibitions. In GFNMS, the exemption is slightly different and considers that all activities currently carried out by the DOD within the sanctuary are essential for the national defense and, therefore, not subject to the regulatory prohibitions. The exemption of additional activities shall be determined in consultation between the DOD and the Sanctuary Superintendent, with authority delegated by the ONMS Director.

One such future potential (not existing) Navy activity is the use of Surveillance Towed Array Sensor System Low Frequency Active (SURTASS LFA) Sonar. The Navy issued a Final Supplemental Environmental Impact Statement/Supplemental Overseas Environmental Impact Statement for SURTASS LFA Sonar. The Navy currently plans to operate up to four SURTASS low frequency active sonar systems for routine training, testing and military operations in the Pacific, Atlantic and Indian Oceans, and the Mediterranean Sea. The Navy's operations could occur in the expanded area pursuant to the appropriate permits and authorizations. Navy consultation with sanctuaries would be required for SURTASS in the existing sanctuaries or proposed expansion area. After consultation, an authorization may be issued by the sanctuaries for the activity.

Activities conducted by the USCG for national defense would not be exempt under these regulations, as the USCG operates as part of DHS and the exemption is specific to DOD uses. Therefore, USCG activities may be affected in slightly different ways than DOD uses in the proposed expansion area.

A second relevant provision is included in the proposed regulations for both sanctuaries that exempts all activities necessary to respond to an emergency threatening life, property, or the environment, or as permitted by the ONMS Director (or delegated to the Sanctuary Superintendent). This proposed provision is the same as the existing regulations.

For DHS (USCG) and DOD activities that do not qualify for either of these exemptions, the specific relevant proposed regulatory prohibitions for the expansion area relate to discharge or deposit of matter or

materials within the sanctuaries and from beyond the boundary of the sanctuaries (when subsequently, a sanctuary resource or quality is injured); introduction or release of introduced species; desertion of a vessel aground, at anchor, or adrift and leaving harmful matter on deserted vessels in GFNMS; abandoning any material on the submerged lands; flying less than 1000 feet over a SWPZ, except for enforcement purposes; and MPWC use, except within four designated zones and for law enforcement and emergency search and rescue missions.

The USCG would assist NOAA in the enforcement of national marine sanctuary regulations in the expansion area, working in cooperation with other law enforcement agencies with jurisdiction over marine waters off the California coast; these include the NOAA Office of Law Enforcement and the CDFW Division of Law Enforcement. Under the NMSA, the Department of Commerce (NOAA) and DOD and USCG are required to engage in consultations prior to sanctuary designation and during instances when a federal agency's action is likely to destroy, cause the loss of, or injure sanctuary resources. Also, when findings and determinations are being made regarding a proposed sanctuary expansion, due to the fact that terms of designation are proposed to change, NOAA follows the same process set out in the NMSA for consultation prior to sanctuary designation. The Secretary of Commerce is required to consult per Section 303(B)(2) with the Secretary of Defense, and would be required to consult with the heads of interested federal agencies such as the head of the DHS.

Regarding interagency cooperation, per Section 304(d)(1)(A), in general, when 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 the actions are subject to consultation with the Secretary. Section 304(d)(1)(B) describes the responsibilities of the parties during such a consultation, including that a written statement must be provided by the federal agency proposing the action to the Secretary of Commerce. The Secretary can provide the federal agency with recommendations and alternatives to further protect sanctuary resources. Section 304(d)(1)(B) also outlines actions that may take place in cases where a recommendation by the Secretary of Commerce is not followed and a sanctuary resource is subsequently injured. As federal agencies, this section applies to DHS and DOD.

While there may be some short term adverse impacts from the proposed action, these effects would be less than significant. The proposed regulation related to prohibiting interference with enforcement actions would have the potential to result in beneficial effects. Each relevant regulation is addressed below.

Discharge Regulations

It is prohibited in CBNMS and GFNMS and would be prohibited in the expansion area to discharge or deposit any matter or material from vessels within or into the sanctuary waters. The exceptions to this prohibition are:

- Fish, fish parts, chumming materials or bait used in lawful fishing activities;
- Clean effluent generated incidental to vessel use by an operable, approved Type I or II MSD (applies to vessels less than 300 GRT or vessels 300 GRT or greater without sufficient capacity to hold sewage while in a sanctuary);

- Clean: vessel deck wash down, vessel engine cooling water, vessel generator cooling water, and bilge water;
- Anchor wash; or
- Vessel engine or generator exhaust.

In addition, the proposed action includes a regulatory change for both CBNMS and GFNMS, to add an exception to the existing discharge prohibition to allow discharge of clean graywater, as defined by Section 312 of the CWA, from vessels less than 300 GRT and from vessels 300 GRT or greater without sufficient holding capacity to hold graywater within the sanctuaries.

As described above, USCG activities would not be exempt from this discharge prohibition (unless associated with an emergency) and, if discharge into CBNMS or GFNMS could not be avoided, would be required to obtain a national marine sanctuary permit. Existing DOD activities essential for national defense would be exempt from the prohibitions. DOD activities associated with an emergency would also be exempt. Exemption of all other DOD activities in the expansion area not essential for national defense or emergencies would be subject to consultation between the DOD and Sanctuary Superintendent, with authority delegated by the ONMS Director. Such activities may be subject to national marine sanctuary permits.

Application of the regulations as part of the proposed action would result in some changes from current practices to USCG and DOD discharges in the expansion area. Other than when an exemption would be applicable (as described above), USCG and DOD vessels, aircraft and spacecraft would need to hold the prohibited discharges while in the waters or over the airspace of the expansion area. Possible examples include when the USCG is engaged in training activities or the DOD is performing a media or public event to demonstrate air or vessel capabilities. They would also need to ensure no matter or material discharged outside the expansion area subsequently entered the sanctuaries and injured a sanctuary resource or quality.

Sewage

As a result of the proposed action, sewage discharge would be limited. USCG and DOD vessels in sanctuary waters with installed toilets could discharge clean effluent (sewage) generated incidental to vessel use by a Type I or Type II MSD, or hold the waste in a Type III MSD (required for vessels 300 GRT and above with capacity to hold the waste). Little impact is expected for vessels with approved Type I and II MSDs. Vessel operators would be required to lock all MSDs in a manner that prevented discharge or deposit of untreated sewage. The majority of USCG and DOD vessels utilizing the expansion area should already have installed toilets and MSDs.

USCG and DOD vessels travelling through existing national marine sanctuaries off the coast of California as well as through the expansion area would either hold their waste (if not clean effluent) for the incremental amount of time it would take to transit the expansion area, or would discharge the waste in allowed areas outside of national marine sanctuary boundaries. The 87-foot USCG Coastal Patrol Boats have limited holding capacity, requiring discharge every 24 to 48 hours, so if they did not have a Type I or II MSD, mission plans for these vessels would need to take the vessels' holding capacity into account to ensure the vessels were outside national marine sanctuary and State waters when a discharge needed to be made.

Depending on the nature of the missions they undertake, this could potentially have an impact on USCG operations. The USCG could apply for a national marine sanctuary permit to allow the sewage discharges and avoid disruption to their missions, therefore the impact would be less than significant. Discharge into a mobile or shore pumpout facility would be an option for waste from some vessels, when the pumpouts had the capacity to accept their volume of waste. Should the USCG or a DOD agency choose to install an MSD, there would be one-time costs for purchase of the device and installation, and periodic costs for maintenance. Should a commercial pumpout facility be used rather than a USCG or DOD pumpout, there could be a cost to pump sewage from the vessel. For vessels that would hold the waste while in the expansion area, USCG and DOD vessels might be required to transit farther than they do currently until the waste could be discharged or pumped out. Due to lack of data, it is not possible to estimate the costs, but it is expected that budget allocations could be made to comply with these environmental regulations pursuant to USCG and DOD regulations and policy. In addition, if there are cases where an activity might merit a national marine sanctuary permit to allow an otherwise prohibited discharge (such as mentioned above for sewage from Coastal Patrol Boats), the agencies could consult to determine if permit issuance meets the conditions in the sanctuary regulations. For example, some USCG vessels have limited capacity to hold discharges while conducting activities beneficial to sanctuary management, such as an enforcement mission; such activities have the potential to be covered by a national marine sanctuary permit.

Due to these factors, the proposed sewage discharge regulations are expected to result in less than significant impacts on the USCG and DOD.

Other Material

The proposed regulations would prohibit USCG and military vessels and aircraft from discharging other wastes, including, but not limited to, clean graywater from vessels 300 GRT or greater with sufficient holding tank capacity and graywater from a vessel of any size that did not meet the CWA section 312 definition of clean, bilge water, and solid waste[22] in all waters of the proposed expansion area. The emergency and national defense exemptions would apply to these discharges.

Currently USCG and DOD vessels are not legally subject to the VGP or NDZ, which apply within 3 miles of the coastline. USCG and DOD vessel requirements vary by discharge types and by ocean region. Some discharges currently allowed by USCG and DOD as described above in the Regulatory Overview would be prohibited in the expansion area under the proposed regulations.

USCG and military vessels 300 GRT or greater transiting the expansion area would normally have the capacity to hold graywater until out of the sanctuary, or, if they did not have the capacity to hold it, to treat it to meet the definition of clean prior to discharge. Vessels less than 300 GRT transiting the expansion area would also normally be able to either hold graywater or discharge graywater that meets the definition of clean. Clean bilge water discharge from other USCG and military vessels in the expansion area would be allowed; USCG vessel operators already generally maintain clean bilge water through the contiguous zone and follow the existing regulatory regime for discharge of oil or oily waste, when doing so does not impair operations. DOD vessel operators generally follow the regulatory regime for bilge water and oil discharge, except when doing so impedes military activities or during conditions summa-

[22] Other matter would include that from aircraft, spacecraft, or space launch, not otherwise exempted.

rized in the Regulatory Overview. Food and other solid waste generated would need to be held until the vessel was in an area where the waste could be discharged according to the USCG or DOD regulatory regime. Data are not available on the amount and types of graywater, bilge water and solid waste currently discharged by USCG and DOD vessels in the expansion area, but most USCG and DOD vessels would be equipped with holding tanks. USCG and military vessels travelling through existing national marine sanctuaries off the coast of California and the expansion area would either hold graywater, bilge water, solid wastes and other types of prohibited materials for the incremental amount of time it would take to transit the expansion area, or would discharge the materials when an exemption applied. From available information on USCG and DOD aircraft and spacecraft activities, their aircraft and spacecraft currently do not regularly discharge into the expansion area (Schultz 2013; Slates 2013; and Delaney 2013), though the potential exists for a limited amount of discharged matter from airlift or aircraft training activities to be deposited in or enter into the expansion area.

Any impacts on USCG and DOD operations from application of the discharge regulations are expected to be less than significant because most USCG and DOD vessels would be able to hold prohibited wastes during the relatively short period of time they would take to transit the expansion area and aircraft/airlift operations would normally be able to avoid discharges into or entering the expansion area.

Introduced Species Regulations

Currently, vessels of the armed forces are not subject to the VGP or the CSLC ballast water management requirements. The release of introduced species by any means and discharge of ballast water would be prohibited in the expansion area; ballast water may contain introduced species. The emergency and national defense exemptions would apply to release of introduced species and ballast water discharge.

As part of the proposed action, USCG and DOD vessels would have to retain ballast water until they were able to discharge it outside sanctuary boundaries or to ballast water reception facilities, if the USCG or DOD have such facilities, unless one of the exemptions applied. The expansion area has not been documented to be an area where USCG and DOD vessels normally take up, exchange, or discharge ballast water. As such, the impact on USCG and DOD vessel operations to prevent release of introduced species via ballast water discharge would be minor and less than significant.

Deserted Vessels Regulation

It is currently illegal to abandon vessels in California State waters (from the mean high tide to 3 nm offshore). It is also illegal to abandon barges greater than 100 gross tons on the navigable waters of the United States per the Abandoned Barge Act of 1992, but there is no comparable federal law for other vessels.

The GFNMS regulation prohibiting vessel desertion would mean no USCG or military vessel could be deserted within the expansion area as part of the proposed action. In addition, no harmful matter could be left aboard a grounded or deserted USCG or military vessel; this could lead to a prohibited discharge or deposit of harmful material or matter from the untended vessel. Among other provisions on deserting a vessel, the GFNMS regulations state a vessel may not be left aground or adrift or be discovered to be aground or adrift without notification to the Director of the ONMS within 12 hours; the Director must also be presented with a preliminary salvage plan within 24 hours of the notification. The potential for a

vessel at anchor to ground or discharge or deposit materials, when the vessel is not secured in a timely manner, is another factor for considering a vessel deserted.

The CBNMS and GFNMS regulations prohibit abandoning any structure or material on the submerged lands of the sanctuaries; this prohibition would extend to the expansion area. While there is no specific CBNMS prohibition against deserting a USCG or military vessel or leaving harmful matter aboard a deserted USCG or military vessel, the existing discharge prohibitions would apply to harmful matter discharged or deposited from an abandoned USCG or military vessel on submerged lands of CBNMS.

The emergency and national defense exemptions would apply to vessel desertion and abandonment on submerged lands in the expansion area.

There is little likelihood of USCG or military vessels being purposely deserted within the expansion area, unless due to an emergency or a reason essential to DOD for national security. USCG and DOD vessels are valuable government assets and the agencies would be required to be accountable for them. Under the proposed regulations, the agencies would need to ensure their capsized, sunken, or otherwise incapacitated vessels in the expansion area be salvaged rather than deserted and that any hazardous substances were removed from grounded or deserted vessels. In such cases where deserting the vessel would occur due to an emergency, the Director would have to be informed and consultation regarding how to proceed would occur. While complying with these regulations might result in a temporary, adverse impact on the USCG or DOD, the agencies would retain their assets and would minimize environmental damage within the national marine sanctuaries.

The impact on homeland security and military uses as a whole from the desertion prohibitions would be less than significant.

SWPZ Overflight Prohibition

Currently, in the proposed expansion area, USCG and DOD aircraft may fly over all areas without restriction, except that they may not violate existing regulations, such as flying in a manner that results in take of species listed as endangered under the ESA. In the existing GFNMS, USCG and DOD aircraft may fly over all areas except less than 1000 feet over the waters within one nm of the Farallon Islands, Bolinas Lagoon, or any ASBS, except to transport people or supplies to and from the Farallon Islands or for enforcement purposes. Such activities are presumed to disturb seabirds and marine mammals.

The proposed action would change the existing GFNMS overflight prohibition over the Farallon Islands, Bolinas Lagoon or any ASBS to a prohibition on disturbing marine mammals or seabirds by flying motorized aircraft at less than 1000 feet over the waters within a designated SWPZ, except to transport persons or supplies to or from the Farallon Islands or for enforcement purposes. There would be a total of five SWPZ within current GFNMS boundaries and two SWPZ within the expansion area. As with other sanctuary regulatory prohibitions, the emergency and national security exemptions would apply.

USCG and DOD plane or helicopter flights within the expansion area that do not involve an emergency or national defense have the potential to be affected by the prohibition. In the existing GFNMS, the proposed SWPZ areas are similar to the areas where flights are currently restricted, so USCG and DOD flight patterns would be very similar to those that occur in GFNMS currently. In the expansion area, the two proposed

SWPZ are only a few miles long and it would only take minutes or seconds (depending on the air speed of the aircraft) to pass over these zones. USCG or DOD aircraft operators could choose to fly outside SWPZ boundaries or could fly more than 1000 feet over the SWPZ; either of these options would mean only minor adjustments, if any, to their flight operations in those two areas, which are not known to be areas of routine use by USCG or DOD aircraft. The most likely use would be by USCG search and rescue missions, which would be allowed through the exemption for emergency response. As such, impacts on homeland security and military aircraft operations, if any, are expected to be minor and less than significant.

MPWC Zones

In the expansion area, operation of MPWC is currently allowed; the USCG and DOD are not known to operate MPWC there. If there were future USCG and DOD activities with MPWC, they would be allowed in the four proposed MPWC zones in the expansion area. Also, the USCG would be able to operate MPWC for emergency search and rescue or law enforcement operations in all waters of the expansion area, as is currently allowed in the existing sanctuaries. MPWC used by USCG or DOD in the designated zones would be required to be equipped with a GPS units. The exemptions for emergency use and for activities essential for DOD national defense would apply to MPWC operation. Since the expansion area is not known to be an area of current or planned MPWC use by USCG or DOD and there is an exemption for law enforcement and emergency response, the impact on homeland security and military operations, if any, would be negligible.

Interference of Enforcement

Both sanctuaries include a proposed prohibition against interfering with an investigation, search, seizure, or disposition of seized property in connection with enforcement of sanctuary regulations or permits. This provision has potentially beneficial impacts on homeland security, as it may improve USCG's ability to assist the sanctuaries in enforcement activities.

Summary of Proposed Action Impacts

To summarize the impacts on homeland security and military uses from the proposed action, there may be some immediate, adverse, but less than significant impacts on activities related to MSD equipment installation and maintenance, and salvage. Impacts resulting from the other prohibitions in the expansion area would be minor and less than significant.

No Action Alternative

Under the No Action alternative, homeland security and military uses would continue to be managed within the proposed expansion area as they are currently managed under federal and state laws, since there would be no expansion. No impacts on homeland security or military uses would occur under the No Action alternative.

Existing Regulations Alternative

Impacts resulting from this alternative would be similar to impacts identified for the proposed action, with only a few differences, outlined below.

The prohibition against interfering with an enforcement action would not be applied to the expansion area, thus this alternative would not achieve the benefits of this provision described for the proposed action. Without the regulation, there is the continued potential for people to interfere with USCG enforcement activities without penalty under the national marine sanctuary regulations.

There would be no exception for clean graywater discharges from vessels, so USCG and DOD vessels for which an emergency exception did not apply or in the case of the DOD, for which a national security exception would not apply, would need to hold all graywater while transiting the expansion area. For vessels with sufficient holding capacity, there would be no impact. For vessels without sufficient holding capacity, the USCG or DOD would need to consider equipment upgrades to hold the graywater, consultation to exempt the activity, or for the USCG, to apply for a national marine sanctuary permit to allow the discharge.

Flight altitude requirements in the expanded area (including for USCG and DOD flights not necessary for national defense or emergency response) would apply over ASBS in the expansion area (rather than the proposed SWPZs), and would remain as they are currently in the existing GFNMS. The differences in the areas subject to flight restrictions would not change the impact conclusions identified for the proposed action. The impact would be minor and less than significant.

MPWC operation in the expansion area would only be allowed for emergency search and rescue missions or law enforcement activities (other than routine training) carried out by the National Park Service, USCG, fire or police departments, or other Federal, State, or local jurisdictions. As described in the proposed action, USCG and DOD do not currently use MPWC in the expansion area, but would be allowed to do so if needed for emergency response or law enforcement. Any impact on future activities would be negligible.

Other regulations relevant to USCG and DOD activities, including prohibition of discharges, introduced species, vessel desertion and abandonment on submerged lands would be the same as the proposed action and the impacts of these regulations would be less than significant, as described for the proposed action.

Arena Cove Boundary Alternative

This boundary alternative could be implemented with the proposed action or the existing regulations alternative. Sanctuary regulations in the additional area included in this alternative would apply to USCG and DOD activities.

The impacts on homeland security and military uses would be similar to those described for the proposed action or existing regulations alternative and would be less than significant. There are no known current military uses in the inner Arena Cove. While USCG plans for operations in the inner Arena Cove are not publicly available, USCG activities in that part of the cove are likely to be similar as those in the expansion area as a whole (e.g. law enforcement, search and rescue, etc.). This alternative would have no impact on military uses, and would have a similar impact on USCG uses as either the proposed action or existing regulations alternative.

MPWC Zones Alternative

The difference in this alternative, as described in Section 3.6 (Alternative MPWC Zones), is that two of the MPWC zones would have different boundaries than those described in the proposed action.

Because the alternative zones are very similar to the proposed zones, the impact on homeland security and military uses in this alternative would be similar to that described for the proposed action. The establishment of the MPWC zones would not interfere with any existing or planned homeland security or military activities. The potential impact, if any, is expected to be limited and less than significant.

4.10 Cumulative Impacts

4.10.1 Introduction

CEQ regulations implementing NEPA 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, NAO 216-6). Cumulative impacts can result from individually minor but collectively significant actions taking place over time (40 CFR 1508.7). NAO 216-6 also requires that cumulative actions, when viewed with other proposed actions that have cumulatively significant impacts, should be discussed in the same impact statement. Per section 5.09(a) of NAO 216-06, impacts of subsequent specific actions by the program will be assessed in subsequent specific NEPA documents.

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" (CEQ 1997). This section presents the methods used to evaluate cumulative impacts, lists projects that may have cumulative effects when combined with the impacts from the proposed action or alternatives discussed in this EIS, and evaluates potential cumulative impacts.

4.10.2 Cumulative Impact Assessment Methods

CEQ's cumulative effects guidance sets out several different methods for assessment such as checklists, modeling, forecasting, and economic impact assessment, where changes in employment, income and population are evaluated (CEQ 1997). This EIS uses a variety of methods, depending on the resource area, to determine cumulative effects. In general, past, present and future foreseeable projects are assessed by topic area. Cumulative effects may arise from single or multiple actions and may result in additive or interactive effects. Interactive effects may be countervailing, where the adverse cumulative effect is less than the sum of the individual effects, or synergistic, where the net adverse effect is greater than the sum of the individual effects (CEQ 1997). The projects in Table 4.10-1 are anticipated to occur in the reasonably foreseeable future within the study area. NOAA has considered the effects of these actions in combination with the impacts of the proposed action to determine the overall cumulative impact on the resources in the study area.

4.10.3 Past, Present and Reasonably Foreseeable Future Projects

The numerous projects that could contribute to cumulative impacts are listed in Table 4.10-1. This list was compiled from several sources. Only those projects with potential to contribute to cumulative impacts are listed. These projects are similar in scope to the proposed action, relate to marine activities, have similar types of impacts within the study area, affect similar resources or are large enough to have far-reaching effects on a resource. This approach was taken to include both projects for which detailed descriptions and expected impacts are known, as well as projects that have less defined impacts, but, as development projects, may contribute to the regional impacts.

Table 4.10-1. Projects with Potential to Contribute to Cumulative Impacts

Project	Project Location	Project Sponsor	Project Description	Projected Completion
MBNMS Expansion	San Francisco Area	NOAA ONMS	Assessment of potential expansion of MBNMS to include the existing San Francisco–Pacifica Exclusion Area, adding 101 sq miles (77 sq nm) to the sanctuary from the waters west of the Golden Gate Bridge to the current sanctuary boundaries.	2014-2015
Essential Fish Habitat (EFH) Five-Year Review	Pacific Coast	Pacific Management Council (PFMC)	PFMC is conducting a 5-year review of Pacific coast groundfish and issued on May 1, 2013 a request for proposals to modify groundfish EFH, including modifications to the boundaries of existing closed areas or the addition of new closed areas. The Council will then decide late 2013 or early 2014 whether sufficient new information exists to pursue modifying groundfish EFH, through an amendment to a fishery management plan or other appropriate process.	2014
ONMS Rulemaking	All National Marine Sanctuaries	NOAA ONMS	NOAA is currently working on a proposal to reorganize the general regulations, consolidate and standardize definitions and permitting regulations, standardize boundary descriptions, and clarify NOAA's ability to evaluate the eligibility for sites to be considered as potential national marine sanctuaries. Most of the proposed changes are technical and procedural clarifications. This proposed rule would streamline the National Marine Sanctuary regulations, effectively eliminating inconsistencies and redundancies and making the regulations more understandable to the public. The proposed regulatory changes do not alter individual sanctuary regulations in a way that would either substantively change existing uses of the sanctuary or prohibit otherwise permitted activities within the sanctuary. This rule does not prohibit any activities that are currently allowed in a sanctuary, nor does it allow an activity that is currently prohibited. This rulemaking proposes to take the following actions: • Clarify procedures for identifying and evaluating marine sites for eligibility as national marine sanctuaries (without changing the process or standards for the actual designation). • Standardize boundary descriptions. • Consolidate and standardize definitions that are common to all sanctuaries (including modifications to definition of MPWC). • Consolidate and standardize the permitting regulations into a single subpart and make minor substantive clarifications. • Make other conforming and administrative changes such as establishing a provision to allow all national marine sanctuary sites authorization authority.	2014

Table 4.10-1. Projects with Potential to Contribute to Cumulative Impacts

Project	Project Location	Project Sponsor	Project Description	Projected Completion
Introduced Species Rulemaking	MBNMS and State waters within GFNMS	NOAA	In 2008, ONMS released a final rule that was a result of a joint management plan review (JMPR) of the Gulf of the Farallones, Monterey Bay, and Cordell Bank national marine sanctuaries (73 FR 70488). These regulations went into effect in March 2009, and they included regulation of introduced species in the federal waters lying beyond the State waters of each sanctuary. In that final rule, NOAA changed the terms of designation for GFNMS and MBNMS to clearly allow regulation of introduced species. NOAA's regulations prohibited introduced species with exceptions for striped bass caught and released during fishing and current State-permitted mariculture activities including introduced species in GFNMS's Tomales Bay. NOAA is currently working on a proposal to alter the original terms of designations for GFNMS and MBNMS to regulate introduced species in both the State and federal waters of the sanctuaries. The regulations for the GFNMS would contain a minor modification to the wording regarding exceptions for introduced species. Also, a limited authorization provision would be added to nationwide regulations to allow introduction of non-invasive introduced species from shellfish mariculture in State waters in GFNMS. The regulations define introduced species generally as non-native species or any organism that has been genetically modified.	2014
Environmental Assessment of Field Operations in the West Coast Region Office of National Marine Sanctuaries	West Coast	NOAA	In compliance with the requirements of NEPA, ONMS is developing regional programmatic environmental assessments (PEAs) that will assess the potential impacts of sanctuary field operations on the natural and human environment. Specific field operations will be evaluated on a regional basis, taking into consideration the protected resources that may be present at each sanctuary. The PEAs will be used to engage in interagency consultation and permitting requirements under NHPA, ESA, MMPA, and EFH provisions of the MSA, as appropriate. Field operations may include vessel, aircraft, and diving operations, as well as deployment of instrumentation and presence of personnel. Through field operations, sanctuary staff may perform scientific research, collect information for educational programs, and monitor various human activities and natural phenomena in support of the NMSA's primary objective of resource conservation and individual sanctuary priorities.	2014

Table 4.10-1. Projects with Potential to Contribute to Cumulative Impacts

Project	Project Location	Project Sponsor	Project Description	Projected Completion
Vessel General Permit (VGP)	Territorial Sea (3 miles from shore)	USEPA	The existing NPDES VGP, administered by the USEPA, replaced the former VGP for discharges incidental to the normal operation of vessels. All vessels (except recreational vessels and vessels of the Armed Forces of the U.S.) are eligible for coverage under the VGP. Waters of the U.S. are subject to the VGP and include the territorial seas as defined in the CWA section 502(8). The types of vessels covered under the VGP include commercial fishing vessels, cruise ships, ferries, barges, mobile offshore drilling units, oil tankers or petroleum tankers, bulk carriers, cargo ships, container ships, other cargo freighters, refrigerant ships, research vessels, emergency response vessels, including firefighting and police vessels, and any other vessels operating in a capacity as a means of transportation. Effluent streams eligible for coverage under the VGP: deck washdown and runoff, bilge water, ballast water, and numerous other specific effluents.	Dec. 19, 2013
Small Vessel General Permit (sVGP)	Territorial Sea (3 miles from shore)	USEPA	A small Vessel General Permit (sVGP) for discharges incidental to the normal operation of vessels was proposed by the USEPA in December 2011, to cover all vessels (except recreational and armed forces vessels) less than 79 feet in length. The USEPA has taken comments on the proposed sVGP and is working on a final decision. Currently, except for ballast water discharges, NPDES permits are not required for any discharges incidental to normal operation of commercial fishing vessels and other non-recreational vessels less than 79 feet. However, unless Congress takes additional action, the moratorium from the requirement to obtain permit coverage for incidental discharges from these vessels expires December 18, 2014. EPA published a draft small Vessel General Permit (sVGP) in 2013 to provide for permit coverage for these incidental discharges and intends to finalize the sVGP at a later date.	2014
Uniform National Discharge Standards (UNDS)	Out to 12 nm from coastline	USEPA and DOD	Section 312(n) of the CWA, added in 1996, requires the USEPA and DOD to identify and evaluate discharges of Armed Forces vessels to determine which discharges require control for protection of the environment and to set standards for those discharges. USEPA and DOD, in consultation with the USCG, have been working on pollution control standards to apply to most U.S. Armed Forces vessels. The standards will be for the required use of marine pollution control devices (MPCDs) to control discharges incidental to the normal operation of an armed forces vessel, and will apply out to 12 nm from the coastline. The final rule to identify and characterize discharges was published May 10, 1999. Rulemaking is underway to establish MPCD performance standards, and within one year after those are established, DOD will have developed implementing instructions.	Ongoing

Table 4.10-1. Projects with Potential to Contribute to Cumulative Impacts

Project	Project Location	Project Sponsor	Project Description	Projected Completion
Russian River Estuary Management	Russian River, Sonoma Co	Sonoma County Water Agency	The key relevant components of this management plan include: (1) seasonal breaching of sandbar across river mouth to allow outflow of river water to prevent flooding upstream and doing so in a way that prevents ocean water from entering the lagoon; (2) Studying the effects on the estuary of the jetty at Goat Rock State Beach and evaluating alternatives that include removing or notching the jetty. The management plan also includes long term monitoring.	Ongoing
Sonoma County Local Coastal Plan Update	Sonoma Co Coastal Zone	Sonoma County Permit and Resource Management Department	The Local Coastal Plan is being updated to be consistent with the 2008 County General Plan and to update/develop policies regarding sea level rise, water quality, biotic resources, coastal erosion and public access. No substantive changes in land use or zoning designations are proposed.	2014

4.10.4 Cumulative Impacts

As the proposed expansion of the sanctuaries is a regulatory and management action rather than a specific development project, the cumulative effects are related primarily to area-wide management of ocean resources. Several of the projects listed in Table 4.10-1 are regulatory as well. For purposes of this cumulative analysis, it is assumed that the programs in Table 4.10-1 would be approved and implemented.

The combination of the proposed action and programs and projects listed in Table 4.10-1 would result in cumulative beneficial effects in both physical and biological resources. There would be no substantive cumulative effects in the topic areas of cultural and maritime heritage resources or homeland security/ military uses beyond what was identified for the proposed action and alternatives. The cumulative projects or programs identified in Table 4.10-1 would not cause adverse impacts on these issue/use areas. In other issues, as described below, the proposed action's contribution to any adverse cumulative effects would be less than significant. In most issue areas, the existing regulations alternative and the two sub-alternatives would have the same cumulative effect as the proposed action. Where there are differences in cumulative impacts among the alternatives within an issue area, such differences are noted.

Physical and Biological Resources

The proposed sanctuary expansion would not contribute to any substantive adverse impacts on air quality or climate change, geology or oceanography, water quality or biological resources. The proposed action, combined with the national rulemaking, EFH review, new VGP, sVGP and UNDS, and MBNMS expansion, would have an overall beneficial cumulative effect on physical and biological resources in the region. The combined resource protection provided by these programs/regulations would result in positive influences on marine habitats and resources.

The only cumulative projects with potential to create an adverse physical or biological effect on the expansion area are current and potential activities associated with the Russian River Estuary Management Program. The Russian River Estuary breaching program involves seasonally breaching the mouth of the Russian River when closed naturally by a sandbar. The breaching is required to allow the outflow of fresh water during times when the river mouth is closed and water levels become high enough to cause flooding of land uses along the river. Breaching is not required for habitat or biological resource protection. The Environmental Impact Report (EIR) prepared for the management of the estuary water levels did not identify any significant adverse impacts on the ocean environment from breaching activities. The breaching activities would be conducted with numerous mitigation measures and it appears that issues such as disturbance of the water column or nearshore areas are negligible. The EIR was primarily focused on impacts on the estuary and river. Impacts from temporary breaching activities on pinniped haulout areas along the ocean shoreline near the river mouth were identified as being less than significant with mitigation. Impacts on pinniped haulout areas in the interior parts of the Russian River, from increased seasonal inundation were identified as significant and unavoidable (SCWA 2010). These interior haulout areas are not within the proposed sanctuary expansion area. The proposed sanctuary expansion would not, in any way, contribute to this adverse impact on wildlife and therefore would not contribute to adverse cumulative effects on wildlife.

Potential removal of the jetty at Goat Rock beach would possibly cause short-term disturbance of the nearshore and shoreline area. The proposed sanctuary expansion would not cause any adverse impacts

along the nearshore or shoreline area and therefore would not contribute to cumulative impacts associated with the jetty removal project.

This analysis would also apply to the existing regulations alternative, Arena Cove boundary alternative and MPWC zones alternative. The No Action alternative would maintain the status quo of ocean management in the expansion area. No additional resource protections from proposed sanctuary regulations would occur. The potential for adverse impacts related to discharges and wildlife disturbance would continue.

Commercial Fishing and Aquaculture

The proposed action does not regulate commercial fishing and would not contribute to regional closures of fishing grounds or other fishery management activities arising from the EFH Five Year Review (see Table 4.10-1). The proposed CBNMS and GFNMS expansion would have beneficial impacts on commercial fisheries and less than significant adverse impacts on commercial fishing operations, as a result of the proposed discharge regulations. The combination of proposed sanctuary discharge regulations, MBNMS expansion (with associated discharge regulations), new VGP and sVGP (if approved) requirements and national marine sanctuary rule making regarding release of introduced species may have some adverse cumulative effects on commercial fishing operators.

The combined expansion of the sanctuaries under the proposed action, the MBNMS expansion near San Francisco and new VGP would result in a larger area where commercial fishing vessels would be prohibited from discharging certain effluents and other materials. However, the proposed action's exemption for clean graywater discharge in both the existing and proposed sanctuary boundaries would partially minimize this effect. The existing regulations alternative would have a slightly higher level of consequences because there would be no graywater exemption. The impacts on commercial fishing from the discharge regulations were identified as less than significant in Section 4.4 (Commercial Fishing and Aquaculture). The cumulative effect would also be less than significant because the MBNMS expansion area is relatively small and CBNMS, GFNMS and MBNMS would include an exemption for clean graywater discharges.

Socioeconomic Resources, Human Uses, and Environmental Justice

The proposed action would result in beneficial impacts on tourism, recreation, local economics and research and education. Minor adverse impacts on recreation due to discharge regulations and limits on MPWC use may occur, as a result of the proposed action. The projects/programs listed in Table 4.10-1 would not cause adverse impacts on socioeconomic resources or human uses in the study area and therefore the cumulative effect would not be greater than what was identified for the proposed action or existing regulations alternative. Neither the proposed action nor the cumulative projects would contribute to adverse effects on environmental justice.

Offshore Energy

The proposed action and action alternatives would result in the prohibition of offshore oil and gas development in the expansion area, as well as in the existing CBNMS and GFNMS. This effect was identified as less than significant in Section 4.7 (Offshore Energy). Oil and gas development would be prohibited in the proposed MBNMS expansion area, which includes a small area on the margin of the Bodega oil and gas basin. The addition of this narrow strip of ocean to the overall sanctuary area would have a negligible impact on offshore energy development. Oil and gas development is permanently banned within State

waters (3 miles from shore) and the remaining area outside of State waters that would be added to MBNMS is very small. The overall cumulative impact on oil and gas development is less than significant due to the fact that there are no existing or planned oil or gas facilities in the region and the total amount of potential resources precluded from future development are a small fraction of the U.S. oil and gas resources.

Alternative energy development such as wind or wave projects could potentially be allowed through a permit or authorization from the sanctuaries, if it met a series of criteria according to 15 CFR Part 922.48; Part 922.83 and Part 922.113. The other projects listed in Table 4.10-1 would not affect alternative energy development. Therefore, cumulative impacts on offshore energy are less than significant. The existing regulations alternative would result in more stringent regulations (i.e., no authorization process to allow seabed disturbance or discharges) that may have a greater adverse impact on development of alternative energy projects in the future. However, there are no existing or planned energy facilities in the proposed expansion area; the impact would be less than significant.

Marine Transportation

Similar to commercial fishing, there is the potential for some adverse impacts on marine transportation from the combination of the discharge regulations of the proposed action, expansion of MBNMS and establishment of the new VGP and sVGP requirements. With the proposed discharge regulations for the CBNMS and GFNMS expansion area and the addition of the MBNMS expansion area, vessels could be required to hold discharges for a longer distance, if transiting up or down the coastline. The proposed action's impacts on marine transportation were identified as less than significant. The incremental increase in impact associated with the cumulative scenario is also considered less than significant; all three sanctuaries would include an exemption for discharge of sewage from Type II and II marine sanitation devices and for clean graywater discharge. The existing regulations alternative would have a slightly higher contribution to cumulative impacts because it would not include an exemption for clean graywater discharges, but the impact would still be less than significant.

Homeland Security and Military Uses

There is the potential for some adverse impacts on homeland security and military uses involving vessel discharges from the combination of the discharge regulations of the proposed action, and the UNDSs, once implemented in the future. However, given the military exemptions in the proposed action for CBNMS and GFNMS and the proposed authorization and permit provisions, cumulative impacts on homeland security and military uses would be minor and less than significant.

4.11 Comparison of Alternatives

4.11.1 Introduction

This section presents a summary comparison of the overall potential environmental impacts of the proposed action and alternatives. Environmental advantages and disadvantages of each alternative are discussed. Sections 4.2 through 4.9 address the individual impacts associated with each alternative, by topic. At the end of this section, a benefits-cost analysis is provided for the proposed action and alternatives, as another method to compare alternatives. The alternatives, as described in Chapter 3, are the proposed action, no action, existing regulations, Arena Cove boundary alternative and MPWC zones alternative. The Arena Cove boundary is a sub-alternative that could be implemented with either the proposed action or existing regulations alternative. The MPWC zones alternative is a sub-alternative to the proposed action. Alternatives that were eliminated from further evaluation are listed in Section 3.7 (Other Alternatives Considered and Eliminated).

4.11.2 Summary Comparison of Impacts

There are environmental tradeoffs among the alternatives and even within resource issue areas or topics, making it difficult to summarize the net effect of the alternatives. Since all of the impact analysis is necessarily qualitative, specifying precise differences among the alternatives is even more difficult. All of the action alternatives would result in beneficial impacts in one or more environmental issue areas, and none of the alternatives would result in a significant adverse impact. The type of impact (e.g., beneficial, adverse or no impact) and relative environmental advantages and disadvantages of the proposed action and alternatives are summarized, by topic, in Table 4.11-1 at the end of this section.

The Proposed Action

The proposed action, NOAA's preferred alternative, would result in substantial beneficial effects in physical resources, biology, cultural and maritime heritage resources, commercial fisheries and socioeconomics (economic factors, recreation, tourism) due to the added protection of resources afforded by the proposed sanctuary regulations and increased awareness of the area's resources. At the same time, the implementation of sanctuary regulations would involve restrictions that could cause adverse, but less than significant, effects on commercial fishing operators, recreational boating, airspace use, marine transportation and homeland security and military vessel operations. These impacts are associated with the regulatory burdens of discharge restrictions, limitations on MPWC and area-specific flight restrictions within the sanctuaries.

No Action Alternative

The impact analysis for No Action describes the impacts of the status quo, where the proposed expansion area is not included in the national marine sanctuary system and continues to be regulated by existing federal and state regulations. No Action results in a no impact determination. This does not suggest that there are not adverse impacts presently occurring and would continue to occur; rather, choosing No Action will not result in any additional adverse or beneficial impacts. Attempting to identify impacts of potential future activities that could occur under the No Action alternative would be speculative and beyond the scope of this EIS. There are opportunity costs associated with the No Action alternative, as identified in Section 4.6 (Socioeconomic Resources, Human Uses, and Environmental Justice).

In summary, the No Action alternative would have the following implications:

- Oil and gas development may occur in federal waters, if federal agencies determined to pursue lease sales in the area in the future; oil and gas facilities would not be allowed in State waters due to the permanent ban on such development by the State government.
- Alternative energy projects could be pursued in both State and federal waters and no additional permitting requirements would be placed on them.
- MPWC use would continue to be allowed throughout the proposed expansion area.
- There would be no added protection for water quality, biological resources and cultural resources that is offered by the proposed action regulations and prohibited activities.
- Commercial fishing, recreational, homeland security, military and other vessels would not be subject to increased discharge regulations, represented by the proposed action and existing regulations alternative.
- Human uses (e.g., offshore cables, piers, moorings, etc.) would not be subject to discharge or seabed disturbance regulations.

Existing Regulations Alternative

This alternative is very similar to the proposed action, in that it offers needed protection to physical, biological and cultural resources in the expansion area, compared to existing conditions. It would have slightly higher levels of beneficial effects in these resource areas, compared to the proposed action, as described below. The existing regulations alternative would have the same impacts as the proposed action in the topic area of offshore oil and gas development.[23] Compared to the proposed action, this alternative would have the following differences in impacts due to differences in the regulations that would be applied to the expansion area:

- Physical Resources – Slightly higher level of beneficial impacts related to air, oceanography and water quality, due to the sanctuary-wide prohibition of MPWC and absence of the proposed authorization process (which could allow activities involving discharges or seabed disturbance);
- Biological Resources – Slightly higher level of beneficial impacts related to wildlife protection, due to the sanctuary-wide prohibition of MPWC use, no clean graywater discharge exemption and absence of an authorization process; less wildlife benefits with the use of ASBS rather than SWPZs for cargo vessel and overflight restrictions.
- Cultural and Marine Heritage Resources – Slightly less benefits in CBNMS due to the absence of the historical resource prohibition that is included in the proposed action; slightly more potential benefits with the absence of the proposed action's authorization process that would have the potential to allow some otherwise prohibited activities such as seabed alteration;
- Interference with Enforcement – The prohibition against interfering with an enforcement action, as described in the proposed action, would not be included in this alternative and therefore the beneficial

[23] The existing regulations would allow oil and gas pipelines in limited conditions, but since there are no existing or planned oil and gas development projects in the area, this is not considered a substantive difference.

impacts (physical resources, biological resources, cultural) associated with this regulation would not occur.

- Commercial Fishing, Recreational Boating, Marine Transportation, Homeland Security and Military Uses – Slightly greater impacts due to more restrictive discharge regulations (no exemption for clean graywater).
- Land Use and Alternative Energy Development – Slightly greater adverse impacts on future development. Without the proposed action's authorization regulations, projects that involved prohibited discharges or seabed disturbance would not be allowed unless they qualified for a sanctuary manager's permit, as described below.

Without an authorization process, which is included in the proposed action, beneficial impacts on physical, biological and cultural resources may be higher than the proposed action because there would be no means to approve activities involving prohibited discharges or alteration of the seabed. Pre-existing uses and activities in the expansion area could only be permitted if they were certified at the time of expansion approval (as allowed under the nationwide sanctuary regulations) or permitted by the individual sanctuaries if the Sanctuary Superintendent finds that the activity would:

(1) Further research or monitoring related to sanctuary resources and qualities;

(2) Further the educational value of the sanctuary;

(3) Further salvage or recovery operations in or near the sanctuary in connection with a recent air or marine casualty; or

(4) Assist in managing the sanctuary.

Overall, the existing regulations alternative would offer environmental advantages over the proposed action in the natural resource areas, but would have disadvantages related to socioeconomics (land use, recreation), and to a lesser extent commercial fishing, marine transportation and homeland security.

Arena Cove Boundary Alternative

This boundary alternative, which could be implemented with either the proposed action or existing regulations alternative, would include the inner Arena Cove in the sanctuary boundaries. By applying sanctuary regulations to this area, this alternative would offer potential increased benefits (relative to the proposed action or existing regulations) in the issue areas of physical resources (air and water quality), biological resources and cultural and marine heritage resources due to protections afforded by the sanctuary regulations. Including this area in the sanctuary and extending the proposed or existing regulations to the inner cove would have the potential to result in a small incremental increase in adverse impacts on commercial fishing, recreation, land use, offshore energy (future wind or wave energy development) and marine transportation, due to the implementation of discharge and seabed disturbance regulations in the cove. The overall impact would still be less than significant. No additional impacts on homeland security or military uses would be expected to occur.

MPWC Zones Alternative

This alternative could be implemented with the proposed action regulations, with the only difference being the size and location of two of the four proposed MPWC zones. The slight differences in size and location would have minor implications in the topic areas of biological resources and recreation. None of the other issue areas or user groups would be affected differently by this alternative. Alternative Zone 4A would be smaller than the proposed action zone and would restrict shoreline access points, which would further limit potential impacts on wildlife and have a slightly higher level of beneficial impact on biological resources.

Table 4.11-1. Comparison of Alternatives

Topic	Proposed Action	No Action Alternative	Existing Regulations	Arena Cove Boundary Alternative*	MPWC Zones Alternative**
Physical Resources (Air quality, oceanography, geology and water quality)	+	O	+ Slightly higher benefit than proposed action	+ Slightly higher benefit than proposed action	+ Same as proposed action
Biological Resources	+	O	+ Slightly higher benefit than proposed action	+ Slightly higher benefit than proposed action	+ Alt. Zone 4A is smaller than the proposed action zone and restricts shoreline access points, which would have a slightly higher level of beneficial impact on biological resources.
Commercial Fishing and Aquaculture	+ (fisheries) ~ (fishing operations)	O	+ ~ Slightly higher level of adverse impact than proposed action; slightly higher benefit on fisheries	+ ~ Same as proposed action	NA
Cultural and Maritime Heritage Resources	+	O	+ Similar to proposed action, some tradeoffs	+ Slightly higher benefit than proposed action due to implementation of protection in the cove	NA
Socioeconomics	O	O	O	O	NA

Key to symbols:

O = No Impact
~ = Less Than Significant Adverse Impact
– = Significant Adverse Impact (Note: no alternative would result in that level of impact)
+ = Beneficial Impact
NA = Not Applicable

Table 4.11-1. Comparison of Alternatives

Topic	Proposed Action	No Action Alternative	Existing Regulations	Arena Cove Boundary Alternative*	MPWC Zones Alternative**
Environmental Justice	O	O	O	O	NA
Tourism	+	O	+ Same as proposed action	+ Same as proposed action	NA
Land Use and Development	~	O	~ Higher level of adverse impact than proposed action; no authorization process to approve new discharges or construction on seabed.	~ Higher level of adverse impact than proposed action; any future uses would be subject to sanctuary regulations and permits	NA
Recreation	~	O	~ Higher level of adverse impact than proposed action	~ Same as proposed action	~ Same as proposed action
Research and Education	+	O	+ Same as proposed action	+ Same as proposed action	NA
Offshore Energy Development	~	O	~ Higher level of adverse impact than proposed action	~ Same as proposed action	NA
Marine Transportation	~	O	~ Higher level of adverse impact than proposed action	~ Same as proposed action	NA
Homeland Security and Military	~	O	~ Higher level of adverse impact than proposed action	O	NA

* Could be implemented with either the proposed action or existing regulations alternative
** Could only be implemented with the proposed action regulations

Key to symbols:
O = No Impact
~ = Less Than Significant Adverse Impact
– = Significant Adverse Impact (Note: no alternative would result in that level of impact)
+ = Beneficial Impact
NA = Not Applicable

Chapter 5

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Appendix B

Findings and Determinations

To be included in Final EIS

Appendix C

Relationship to Other Legal Requirements

To be included in Final EIS

Appendix D

Revised Terms of CBNMS and GFNMS Designation

Appendix D

REVISED TERMS OF CBNMS AND GFNMS DESIGNATION

Section 304(a)(4) of the NMSA requires that the terms of national marine sanctuary designation include the geographic area 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 subject to regulation by the Secretary to protect these characteristics. Section 304(a)(4) also specifies that the terms of designation may be modified only by the same procedures by which the original designation was made.

To implement this action, the CBNMS and GFNMS terms of designation, published in the Federal Register for CBNMS and GFNMS on Nov. 20, 2008 (73 FR 70488), are proposed to be modified; the modified versions are reproduced here for the reader's convenience. Should there be any discrepancy between this document and the revised terms of designation presented in the notice of proposed rulemaking that accompanies this DEIS, the terms of designation in the notice of proposed rulemaking shall take precedence. The modified terms of designation are proposed to read as follows (new text underlined and deleted text in strikethrough text):

~~Revised~~ TERMS OF DESIGNATION~~esignation Document~~ FOR~~or~~ THE~~the~~ CORDELL~~ordell~~ BANK~~ank~~ NATIONAL~~ational~~ MARINE~~arine~~ SANCTUARY~~anctuary~~[1]

Preamble

Under the authority of Title III of the Marine Protection, Research, and Sanctuaries Act of 1972, as amended, 16 U.S.C. 1431 *et seq.* (the "Act"), ~~the~~ Cordell Bank, Bodega Canyon, and their~~its~~ surrounding waters and submerged lands offshore northern California, as described in Article II~~2~~, are hereby designated as the Cordell Bank National Marine Sanctuary (the Sanctuary) for the purpose of protecting and conserving that special, discrete, highly productive marine area and ensuring the continued availability of the conservation, ecological, research, educational, aesthetic, historical, and recreational resources therein.

Article I. Effect of Designation

The Sanctuary was designated on May 24, 1989 (54 FR 22417). Section 308 of the National Marine Sanctuaries Act, 16 U.S.C. 1431 et seq. (NMSA), authorizes the issuance of such regulations as are necessary to implement the designation, including managing, protecting and conserving the conservation, recreational, ecological, historical, cultural, archeological, scientific, educational, and aesthetic resources and qualities of the Sanctuary. Section 1 of

[1] Original Source: 54 FR 22417; May 24, 1989. Revised: 73 FR 70488; Nov. 20, 2008.

Article IV of these~~is~~ Terms of Designation ~~Document~~ lists activities of the types that are either to be regulated on the effective date of final rulemaking or may have to be regulated at some later date in order to protect Sanctuary resources and qualities. Listing does not necessarily mean that a type of activity~~ies~~ will be regulated; however, if a type of activity is not listed it may not be regulated, except on an emergency basis, unless Section 1 of Article IV is amended to include the type of activity by the same procedures by which the original designation was made.

Article II. Description of the Area

The Sanctuary consists of an approximately 971~~399~~ square nautical mile area of marine waters and the submerged lands thereunder encompassed by a northern boundary ~~extending approximately 250° from the northernmost~~that begins approximately 6 nautical miles west of Bodega Head in Sonoma County, California and extends west approximately 38 nautical miles, coterminous with the boundary of the Gulf of the Farallones National Marine Sanctuary (GFNMS). From that point, the western boundary of the Sanctuary extends south approximately 38 nautical miles. From that point, the southern boundary of the Sanctuary continues east 15 nautical miles, where it intersects the GFNMS boundary. The eastern boundary of the Sanctuary is coterminous with the GFNMS boundary, and is a series of straight lines connecting in sequence, ~~to the 1,000 fathom isobath northwest of the Bank, then south along this isobath to the GFNMS boundary and~~ back ~~to the northeast along this boundary~~ to the beginning point. The precise boundaries are set forth in the regulations.

Article III. Characteristics of the Area That Give it Particular Value

Cordell Bank and Bodega Canyon are~~is~~ characterized by a combination of oceanic conditions and undersea topography that provides for a highly productive environment in a discrete, well-defined area. In addition, the Bank, Canyon, and their~~its~~ surrounding waters may contain historical resources of national significance. The Bank consists of a series of steep-sided ridges and narrow pinnacles rising from the edge of the continental shelf. The Bank is~~It lies on a plateau~~ 300-400 feet (91-122 meters) deep and ascends to within ~~about~~ 115 feet (35 meters) of the surface at its shallowest point. Bodega Canyon is about 12 miles (10.8 nautical miles) long and is over 5,000 feet (1,524 m) deep. The seasonal upwelling of nutrient-rich bottom waters and wide depth ranges in the vicinity, have led to a unique association of subtidal and oceanic species. The vigorous biological community flourishing at Cordell Bank and Bodega Canyon includes an exceptional assortment of ~~algae,~~ invertebrates, fishes, marine mammals and seabirds. Predators travel from thousands of miles away to feed in these productive waters.

Article IV. Scope of Regulation

Section 1. Activities Subject to Regulation

The following activities are subject to regulation, including prohibition, as may be necessary to ensure the management, protection, and preservation of the conservation, recreational, ecological, historical, cultural, archeological, scientific, educational, and aesthetic resources and qualities of this area:

a. Depositing or discharging any material or substance;

b. Removing, taking, or injuring or attempting to remove, take, or injure benthic invertebrates or algae located on the Bank or on or within the line representing the 50 fathom isobath surrounding the Bank;

c. Exploring for, developing or producing oil, gas or minerals within the Sanctuary~~Hydrocarbon (oil and gas) activities within the Sanctuary~~;

d. Anchoring on the Bank or on or within the line representing the 50 fathom contour surrounding the Bank;

e. Activities regarding cultural or historical resources;

f. 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;

g. Taking or possessing any marine mammal, marine reptile, or bird except as permitted under the Marine Mammal Protection Act, Endangered Species Act or Migratory Bird Treaty Act; ~~and~~

h. Introducing or otherwise releasing from within or into the Sanctuary an introduced species~~.~~; and

i. Interfering with an investigation, search, seizure, or disposition of seized property in connection with enforcement of the Act or Sanctuary regulations.

In addition, a permit or authorization may not be issued for exploring for, developing or producing oil, gas, or minerals within the Sanctuary under any circumstances.

Section 2. Consistency with International Law

The regulations governing activities listed in section 1 of this Article shall apply to foreign flag vessels and foreign persons only to the extent consistent with generally recognized principles of international law, and in accordance with treaties, conventions, and other agreements to which the United States is a party.

Section 3. Emergency Regulations

Where necessary to prevent or minimize the destruction of, loss of, or injury to a Sanctuary resource or quality, or minimize the imminent risk of such destruction, loss, or injury, any and all activities, including those not listed in section 1 of this Article, are subject to immediate regulation, including prohibition, within the limits of the Act on an emergency basis for a period not to exceed 120 days.

Article V. Relation to Other Regulatory Programs

Section 1. Fishing

The regulation of fishing is not authorized under Article IV. All regulatory programs pertaining to fishing, including Fishery Management Plans promulgated under the Magnuson-Stevens Fishery Conservation and Management Act, 16 U.S.C. 1801 *et seq.* ("Magnuson-Stevens Act"), shall remain in effect. All permits, licenses, approvals, and other authorizations issued pursuant to the Magnuson-Stevens Act shall be valid within the Sanctuary. However, all fishing vessels are subject to regulation under Article IV with respect to discharges and anchoring.

Section 2. Defense Activities

The regulation of activities listed in Article IV shall not prohibit any Department of Defense (DOD) activities that are necessary for national defense. All such activities being carried out by DOD within the Sanctuary on the effective date of designation shall be exempt from any prohibitions contained in the Sanctuary regulations. Additional DOD activities initiated after the effective date of designation that are necessary for national defense will be exempted after consultation between the Department of Commerce and DOD. DOD activities not necessary for national defense, such as routine exercises and vessel operations, shall be subject to all prohibitions contained in the Sanctuary regulations.

Section 3. Other Programs

All applicable regulatory programs shall remain in effect, and all permits, licenses, approvals, and other authorizations issued after July 31, 1989 with respect to activities conducted within the original Sanctuary boundary and after the effective date of expansion of the Sanctuary with respect to activities conducted within the expansion area pursuant to those programs shall be valid unless prohibited by regulations implementing Article IV.

Article VI. Alterations to This Designation

The terms of designation, as defined under section 304(a) of the Act, may be modified only by the same procedures by which the original designation is made, including public hearings, consultation with interested Federal, State, and local agencies, review by the appropriate Congressional committees and Governor of the State of California, and approval by the Secretary of Commerce or designee.

~~REVISED~~ TERMS OF DESIGNATION ~~DOCUMENT~~ FOR THE GULF OF THE FARALLONES NATIONAL MARINE SANCTUARY[2]

Preamble

Under the authority of Title III of the Marine Protection, Research and Sanctuaries Act of 1972, Public Law 92– 532 (the Act), the waters and submerged lands along the Coast of

[2] Original Source: 46 FR 7936; January 26, 1981. Revised: 73 FR 70488; Nov. 20, 2008.

California ~~north and~~ south of Alder Creek along the 39th parallel ~~Point Reyes Headlands~~, between Manchester Beach in Mendocino County ~~Bodega Head~~ and Rocky Point in Marin County and surrounding the Farallon Islands and Noonday Rock along the northern coast of California, are hereby designated a National Marine Sanctuary for the purposes of preserving and protecting this unique and fragile ecological community.

Article I. Effect of Designation

Within the area ~~designated in 1981 as The Point Reyes/Farallon Islands National Marine Sanctuary (the Sanctuary)~~ described in Article II, the Act authorizes the promulgation of such regulations as are reasonable and necessary to protect the values of the Gulf of the Farallones National Marine Sanctuary (the Sanctuary). Section 1 of Article IV of these~~is~~ Terms of Designation ~~Document~~ lists activities of the types that are either to be regulated on the effective date of final rulemaking or may have to be regulated at some later date in order to protect Sanctuary resources and qualities. Listing does not necessarily mean that a type of activity will be regulated; however, if a type of activity is not listed it may not be regulated, except on an emergency basis, unless section 1 of Article IV is amended to include the type of activity by the same procedures by which the original designation was made.

Article II. Description of the Area

The Sanctuary consists of an area of the waters and the submerged lands thereunder adjacent to the coast of California of approximately 2,490~~966~~ square nautical miles (nmi).~~,~~ The boundary extends~~ing~~ seaward to a distance of 30~~6~~ nmi west from the mainland at Manchester Beach and extends south approximately 45 nmi to the northwestern corner of Cordell Bank National Marine Sanctuary (CBNMS), and extends approximately 38 nmi east along the northern boundary of CBNMS, approximately 7 nautical miles west of Bodega Head. The boundary extends from ~~Point Reyes to~~ Bodega Bay to Point Reyes and 12 nmi west from the Farallon Islands and Noonday Rock, and includes~~ing~~ the intervening waters and submerged lands. The Sanctuary includes Bolinas Lagoon, Tomales Bay, Giacomini Wetland, Estero de San Antonio (to the tide gate at Valley Ford-Franklin School Road) and Estero Americano (to the bridge at Valley Ford-Estero Road), as well as Bodega Bay, but does not include Bodega Harbor, the Salmon Creek Estuary, the Russian River Estuary, the Gualala River Estuary, the Arena Cove Pier or the Garcia River Estuary. The precise boundaries are defined by regulation.

Article III. Characteristics of the Area That Give It Particular Value

The Sanctuary encompasses a globally significant coastal upwelling center that includes a rich and diverse marine ecosystem and a wide variety of marine habitats, including habitat for over 36 species of marine mammals. Rookeries for over half of California's nesting marine bird populations and nesting areas for at least 12 of 16 known U.S. nesting marine bird species are found within the boundaries. Abundant populations of fish and shellfish are also found within the Sanctuary. The Sanctuary also has one of the largest seasonal concentrations of white sharks (*Carcharodon carcharias*) in the world. The area adjacent to and offshore of Point Arena, due to seasonal winds, currents and oceanography, drives one of the most prominent and persistent upwelling centers in the world, supporting the productivity of the sanctuary. The nutrient rich

water carried down coast by currents promote thriving nearshore kelp forests, productive commercial and recreational fisheries, and diverse wildlife assemblages. Large predators, such as white sharks, travel from thousands of miles away to feed in these productive waters. Rocky shores along the Sonoma and Mendocino County coastlines are largely intact, and teem with crustaceans, algae, fish and birds.

Article IV. Scope of Regulation

Section 1. Activities Subject to Regulation

The following activities are subject to regulation, including prohibition, as may be necessary to ensure the management, protection, and preservation of the conservation, recreational, ecological, historical, cultural, archeological, scientific, educational, and aesthetic resources and qualities of this area:

a. Exploring for, developing or producing oil, gas, or minerals, within the Sanctuary~~Hydrocarbon operations~~;

b. Discharging or depositing any substance within or from beyond the boundary of the Sanctuary;

c. 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;

d. Activities regarding cultural or historical resources;

e. Introducing or otherwise releasing from within or into the Sanctuary an introduced species;

f. Taking or possessing any marine mammal, marine reptile, or bird within or above the Sanctuary except as permitted by the Marine Mammal Protection Act, Endangered Species Act and Migratory Bird Treaty Act;

g. Attracting or approaching any animal;~~ and~~

h. Operating a vessel (i.e., watercraft of any description) within the Sanctuary; and

i . Interfering with an investigation, search, seizure, or disposition of seized property in connection with enforcement of the Act or Sanctuary regulations.

In addition, a permit or authorization may not be issued for exploring for, developing or producing oil, gas, or minerals within the Sanctuary under any circumstances.

Section 2. Consistency With International Law

The regulations governing the activities listed in section 1 of this Article will apply to foreign flag vessels and persons not citizens of the United States only to the extent consistent

with recognized principles of international law, including treaties and international agreements to which the United States is signatory.

Section 3. Emergency Regulations

Where necessary to prevent or minimize the destruction of, loss of, or injury to a Sanctuary resource or quality, or minimize the imminent risk of such destruction, loss, or injury, any and all activities, including those not listed in section 1 of this Article, are subject to immediate temporary regulation, including prohibition.

Article V. Relation to Other Regulatory Programs

Section 1. Fishing and Waterfowl Hunting

The regulation of fishing, including fishing for shellfish and invertebrates, and waterfowl hunting, is not authorized under Article IV. However, fishing vessels may be regulated with respect to vessel operations in accordance with Article IV, section 1, paragraphs (b) and (h), and mariculture activities involving alterations of or construction on the seabed, or release of introduced species by mariculture activities not covered by a valid lease from the State of California and in effect on the effective date of the final regulation, can be regulated in accordance with Article IV, section 1, paragraph (c) and (e). All regulatory programs pertaining to fishing, and to waterfowl hunting, including regulations promulgated under the California Fish and Game Code and Fishery Management Plans promulgated under the Magnuson-Stevens Fishery Conservation and Management Act, 16 U.S.C. 1801 *et seq.*, will remain in effect, and all permits, licenses, and other authorizations issued pursuant thereto will be valid within the Sanctuary unless authorizing any activity prohibited by any regulation implementing Article IV.

The term ‘‘fishing’’ as used in this Article includes mariculture.

Section 2. Defense Activities

The regulation of activities listed in Article IV shall not prohibit any Department of Defense activity that is essential for national defense or because of emergency. Such activities shall be consistent with the regulations to the maximum extent practicable.

Section 3. Other Programs

All applicable regulatory programs will remain in effect, and all permits, licenses, approvals, and other authorizations issued after January 16, 1981 with respect to activities conducted within the original Sanctuary boundary and after the effective date of the expansion of the Sanctuary with respect to activities conducted within the expansion area~~pursuant thereto~~ will be valid within the Sanctuary unless prohibited by regulations implementing Article IV. No valid lease, permit, license, approval or other authorization for activities in the expansion area of the Sanctuary issued by any federal, State, or local authority of competent jurisdiction and in effect on the effective date of the expansion may be terminated by the Secretary of Commerce or by his or her designee provided the holder of such authorization complies with the certification procedures established by Sanctuary regulations.

Article VI. Alterations to This Designation

The terms of designation, as defined under section 304(a) of the Act, may be modified only by the same procedures by which the original designation is made, including public hearings, consultation with interested Federal, State, and local agencies, review by the appropriate Congressional committees and Governor of the State of California, and approval by the Secretary of Commerce or designee.

Appendix E

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Appendix E

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Appendix F

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Appendix F

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Appendix G

Biological Resources Species Lists

Appendix G

BIOLOGICAL RESOURCES SPECIES LISTS

Introduction

This appendix includes the lists of biological species known to occur in the proposed expansion area for CBNMS and GFNMS, as described in Chapter 3 (Description of Proposed Action and Alternatives). Many of these species are the same as those occurring in the existing CBNMS and GFNMS boundaries. The species are listed as follows:

Table G-1 – Fish and Reptiles

Table G-2 – Birds and Mammals

Table G-3 – Invertebrates

Table G-4 – Algae and Plants

These lists include species that have been recorded alive or dead or, for some species of fish, are suspected of occurring within the proposed expansion area for CBNMS and GFNMS based on the documented range of the species. In addition to common and scientific names of each specific taxon, the lists include information or data on Federal listed status. Also noted by asterisk (*) for bird and mammal species, is if the sanctuary is used by that species for foraging, roosting, nesting, and/or rearing of young during its breeding season.

Taxonomic classification, phylogenetic order, and all other information are according to references used in May 2013[3] for each class of species, listed at the end of this appendix. Each class has slightly differing criteria for acceptance to the list. For mammals, the list includes all marine species, including vagrants, which have been recorded within sanctuary waters, either observed alive or dead. Only one fresh-water/estuarine species, river otter, is included based on occurrence in coastal bodies of water and because the proposed expansion boundary include habitats were these otters have been documented.

For birds, the list includes all marine species, including vagrants that have been recorded in the proposed expansion area. These birds include nearshore and offshore species. Estuarine species are not included unless they are known to fly over any portion of the propsed expansion area.

[3] Information regarding the status for Steller sea lions was updated in January 2014. Steller sea lions in the California, Oregon and Washington population were delisted from the threatened species list.

For reptiles and fish, the lists include those species recorded in the sanctuary plus others suspected of occurring based on records both north and south of the sanctuary, but for which no definite records are currently known.

Species Tables

The headings of the lists include the following categories:
COMMON NAME - The common (English) name of the species.
SCIENTIFIC NAME - The scientific (Latin) name of the species.

FEDERAL STATUS (for fish, reptiles, birds and mammals) - The federal listed status as of May 2013 (as found at URL: http://ecos.fws.gov/ecos/indexPublic.do). These designations are given if any population or subspecies occurring in the sanctuary is so listed:

E - Endangered
T - Threatened
D – Delisted since designation of the sanctuary

Table G-1. Fish and Reptiles Species List

Common Name	Scientific Name	Federal Status
FISH		
Northern Spearnose Poacher	*Agonopsis vulsa*	
Giant Grenadier	*Albatrossia pectoralis*	
Longnose Lancetfish	*Alepisaurus ferox*	
California Slickhead	*Alepocephalus tenebrosus*	
Oxeye oreo	*Allocyttus folletti*	
Whitebait Smelt	*Allosmerus elongatus*	
Thresher Shark	*Alopias vulpinus*	
American Shad	*Alosa sapidissima*	
Broad skate	*Amblyraja badia*	
Pacific Sand Lance	*Ammodytes hexapterus*	
Barred Surfperch	*Amphistichus argenteus*	
Calico Surfperch	*Amphistichus koelzi*	
Redtail Surfperch	*Amphistichus rhodoterus*	
Wolf-Eel	*Anarrhichthys ocellatus*	
High Cockscomb	*Anoplarchus purpurescens*	
Fangtooth	*Anoplogaster cornuta*	
Sablefish	*Anoplopoma fimbria*	
Daggertooth	*Anotopterus pharao*	
Finescale Codling	*Antimora microlepis*	
Penpoint Gunnel	*Apodichthys flavidus*	
Rockweed Gunnel	*Apodichthys fucorum*	
Brown Catshark	*Apristurus brunneus*	
Longnose Catshark	*Apristurus kampae*	

Table G-1. Fish and Reptiles Species List

Common Name	Scientific Name	Federal Status
Pacific Argentine	*Argentina sialis*	
Slender Hatchetfish	*Argyropelecus affinis*	
Spurred Hatchetfish	*Argyropelecus hemigymnus*	
Silver Hatchetfish	*Argyropelecus lychnus*	
Silvery Hatchetfish	*Argyropelecus sladeni*	
Shiny Loosejaw	*Aristostomias scintillans*	
Corraline Sculpin	*Artedius corallinus*	
Padded Sculpin	*Artedius fenestralis*	
Scalyhead Sculpin	*Artedius harringtoni*	
Smoothhead Sculpin	*Artedius lateralis*	
Bonyhead Sculpin	*Artedius notospilotus*	
Rosylip Sculpin	*Ascelichthys rhodorus*	
Arrowtooth Flounder	*Atheresthes stomias*	
Topsmelt	*Atherinops affinis*	
Jacksmelt	*Atherinopsis californiensis*	
White Seabass	*Atractoscion nobilis*	
Tubesnout	*Aulorhynchus flavidus*	
Highfin Dragonfish	*Bathophilus flemingi*	
Blackfin poacher	*Bathyagonus nigripinnis*	
Bigeye Poacher	*Bathyagonus pentacanthus*	
Snubnose Blacksmelt	*Bathylagoides wesethi*	
Pacific Blacksmelt	*Bathylagus pacificus*	
Deepsea Skate	*Bathyraja abyssicola*	
Sandpaper Skate	*Bathyraja interrupta*	
White Skate	*Bathyraja spinosissima*	
Black Skate	*Bathyraja trachura*	
Silverspotted Sculpin	*Belpsias cirrhosus*	
Northern Pearleye	*Benthalbella dentata*	
Rockhead	*Bothragonus swanii*	
Twoline Eelpout	*Bothrocara brunneum*	
Soft Eelpout	*Bothrocara molle*	
Kelp Perch	*Brachyistius frenatus*	
Pacific Pomfret	*Brama japonica*	
Red Brotula	*Brosmophycis marginata*	
White Shark	*Carcharodon carcharias*	
Blacktail Snailfish	*Careproctus melanurus*	
Veilfin	*Caristius macropus*	
Ocean Whitefish	*Caulolatilus princeps*	
Monkeyface Prickleback	*Cebidichthys violaceus*	
Dogtooth Lampfish	*Ceratoscopelus townsendi*	
Basking Shark	*Cetorhinus maximus*	
Pacific Viperfish	*Chauliodus macouni*	
Smallhead Flyingfish	*Cheilopogon pinnatibarbatus*	

Table G-1. Fish and Reptiles Species List

Common Name	Scientific Name	Federal Status
Warty Poacher	*Chesnonia verrucosa*	
Spotted Cusk Eel	*Chilara taylori*	
Decorated Warbonnet	*Chirolophis decoratus*	
Mosshead Warbonnet	*Chirolophis nugator*	
Roughback Sculpin	*Chitonotus pugetensis*	
Pacific Sanddab	*Citharichthys sordidus*	
Speckled Sanddab	*Citharichthys stigmaeus*	
Roughscale Sole	*Clidoderma asperrimum*	
Sharpnose Sculpin	*Clinocottus acuticeps*	
Wooly Sculpin	*Clinocottus analis*	
Calico Sculpin	*Clinocottus embryum*	
Mosshead Sculpin	*Clinocottus globiceps*	
Bald Sculpin	*Clinocottus recalvus*	
Pacific Herring	*Clupea pallasii*	
Shoulderspot Grenadier	*Coelorinchus scaphopsis*	
Pacific Saury	*Cololabis saira*	
Dolphinfish	*Coryphaena hippurus*	
Pacific Grenadier	*Coryphaenoides acrolepis*	
Snubnose Pipefish	*Cosmocampus arctus*	
Benttooth Bristlemouth	*Cyclothone acclinidens*	
Veiled Anglemouth	*Cyclothone microdon*	
Showy Bristlemouth	*Cyclothone signata*	
Bobtail Snipe Eel	*Cyema atrum*	
Shiner Perch	*Cymatogaster aggregata*	
Pile Perch	*Damalichthys vacca*	
Bigeye Lightfish	*Daphnos oculatus*	
Diamond Stingray	*Dasyatis dipterura*	
Pelagic Stingray	*Dasyatis violacea*	
Whiptail Ribbonfish	*Desmodema lorum*	
California Headlightfish	*Diaphus theta*	
Balloonfish	*Diodon holocanthus*	
Diogenes Lanternfish	*Diogenes laternatus*	
Prickly Shark	*Echinorhinus cookei*	
Blackbelly Snailfish	*Elassodiscus caudatus*	
Deepsea Sole	*Embassichthys bathybius*	
Black Perch	*Embiotoca jacksoni*	
Striped Seaperch	*Embiotoca lateralis*	
Flatcheek Eelpout	*Embryx crotalina*	
Northern Anchovy	*Engraulis mordax*	
Buffalo Sculpin	*Enophrys bison*	
Bull Sculpin	*Enophrys taurina*	
Petrale Sole	*Eopsetta jordani*	
Black Hagfish	*Eptatretus deani*	

Table G-1. Fish and Reptiles Species List

Common Name	Scientific Name	Federal Status
Pacific Hagfish	*Eptatretus stoutii*	
Skilfish	*Erilepis zonifer*	
Pacific Cod	*Gadus macrocephalus*	
Tope or Soupfin Shark	*Galeorhinus galeus*	
Threespine Stickleback	*Gasterosteus aculeatus*	
White Croaker	*Genyonemus lineatus*	
Striped Kelpfish	*Gibbonsia metzi*	
Crevice Kelpfish	*Gibbonsia montereyensis*	
Rex Sole	*Glyptocephalus zachirus*	
Northern Clingfish	*Gobiesox maeandricus*	
Red Irishlord	*Hemilepidotus hemilepidotus*	
Brown Irishlord	*Hemilepidotus spinosus*	
Giant Kelpfish	*Heterostichus rostratus*	
Kelp Greenling	*Hexagrammos decagrammus*	
Rock Greenling	*Hexagrammos superciliosus*	
Bluntnose Sixgill Shark	*Hexanchus griseus*	
Flathead Sole	*Hippoglossoides elassodon*	
Pacific Halibut	*Hippoglossus stenolepis*	
Spotted Ratfish	*Hydrolagus colliei*	
Spotfin Surfperch	*Hyperprosopon anale*	
Walleye Surfperch	*Hyperprosopon argenteum*	
Silver Surfperch	*Hyperprosopon ellipticum*	
Surf Smelt	*Hypomesus pretiosus*	
Kelp Poacher	*Hypsagonus mozinoi*	
Diamond Turbot	*Hypsopsetta guttulata*	
Rainbow Surfperch	*Hypsurus caryi*	
Dusky Sculpin	*Icelinus burchami*	
Threadfin Sculpin	*Icelinus filamentosus*	
Frogmouth Sculpin	*Icelinus oculatus*	
Yellowchin Sculpin	*Icelinus quadriseriatus*	
Spotfin Sculpin	*Icelinus tenuis*	
Medusafish	*Icichthys lockingtoni*	
Ragfish	*Icosteus aenigmaticus*	
Pacific Blackdragon	*Idiacanthus antrostomus*	
Butter Sole	*Isopsetta isolepis*	
Shortfin Mako	*Isurus oxyrinchus*	
Longfin Sculpin	*Jordania zonope*	
Sixspot Prickleback	*Kasatkia seigeli*	
Skipjack Tuna	*Katsuwonus pelamis*	
Oceanic Pufferfish	*Lagocephalus lagocephalus*	
Salmon Shark	*Lamna ditropis*	
Brokenline Lanternfish	*Lampanyctus jordani*	
Western River Lamprey	*Lampetra ayersii*	

Table G-1. Fish and Reptiles Species List

Common Name	Scientific Name	Federal Status
Pacific Lamprey	*Lampreta tridentata*	SC
Opah	*Lampris regius*	
Escolar	*Lepidocybrium flavobrunneum*	
Bay Goby	*Lepidogobius lepidus*	
Rock Sole	*Lepidopsetta bilineata*	
Pacific Scabbardfish	*Lepidopus fitchi*	
Staghorn Sculpin	*Leptocottus armatus*	
Slender Barracudina	*Lestidiops ringens*	
Northern Smoothtongue	*Leuroglossus schmidti*	
California Smoothtongue	*Leuroglossus stilbius*	
SouthernRingtail Snailfish	*Liparis adiastolus*	
Tidepool Snailfish	*Liparis florae*	
Slipskin Snailfish	*Liparis fuscensis*	
Slimy Snailfish	*Liparis mucosus*	
Popeye Blacksmelt	*Lipolagus ochotensis*	
Showy Snailfish	*Lipris pulchellus*	
Louvar	*Luvarus imperialis*	
Snakehead eelpout	*Lycenchelys crotalinus*	
Blackmouth Eelpout	*Lycodapus fierasfer*	
Pallid Eelpout	*Lycodapus mandibularis*	
Bigfin Eelpout	*Lycodes cortezianus*	
Black Eelpout	*Lycodes diapterus*	
Blackbelly Eelpout	*Lycodes pacificus*	
Bearded Eelpout	*Lyconema barbatum*	
Slender Sole	*Lyopsetta exilis*	
Pacific Barreleye	*Macropinna microstoma*	
Highsnout Bigscale	*Melamphaes lugubris*	
Midwater Eelpout	*Melanostigma pammelas*	
Pacific Hake	*Merluccius productus*	
Pacific Tomcod	*Microgadus proximus*	
Reef Perch	*Micrometrus aurora*	
Dwarf Perch	*Micrometrus minimus*	
Dover Sole	*Microstomus pacificus*	
Ocean Sunfish	*Mola mola*	
Striped Bass	*Morone saxatilis*	
Gray Smoothhound	*Mustelus californicus*	
Brown Smoothhound	*Mustelus henlei*	
Bat Ray	*Myliobatis californica*	
Pinpoint Lampfish	*Nannobrachium regale*	
Broadfin Lampfish	*Nannobrachium ritteri*	
Sailfin Sculpin	*Nautichthys oculofasciatus*	
Slender Snipe Eel	*Nemichthys scolopaceus*	
Sarcastic Fringehead	*Neoclinus blanchardi*	

Table G-1. Fish and Reptiles Species List

Common Name	Scientific Name	Federal Status
Onespot Fringehead	*Neoclinus uniornatus*	
California Grenadier	*Nezumia stelgidolepis*	
Broadnose Sevengill Shark	*Notorynchus cepedianus*	
Patchwork Lampfish	*Notoscopelus resplendens*	
Pygmy Poacher	*Odontopyxis trispinosa*	
Tidepool Sculpin	*Oligocottus maculosus*	
Saddleback Sculpin	*Oligocottus rimensis*	
Rosy Sculpin	*Oligocottus rubellio*	
Fluffy Sculpin	*Oligocottus snyderi*	
Pink Salmon	*Oncorhynchus gorbuscha*	
Chum Salmon	*Oncorhynchus keta*	T
Coho Salmon [Silver Salmon]	*Oncorhynchus kisutch*	E & T regional
Rainbow Trout [Steelhead]	*Oncorhynchus mykiss*	T
Sockeye Salmon	*Oncorhynchus nerka*	
Chinook Salmon	*Oncorhynchus tshawytscha*	E & T regional
Pacific Snake Eel	*Ophichthus triserialis*	
Yellow Snake Eel	*Ophichthus zaphochir*	
Lingcod	*Ophiodon elongatus*	
Snubnose Sculpin	*Orthonopias triacis*	
Señorita	*Oxyjulis californica*	
Painted Greenling	*Oxylebius pictus*	
Tubenose Poacher	*Pallasina barbata*	
California Halibut	*Paralichthys californicus*	
Red Snailfish	*Paraliparis dactylosus*	
Thornback Sculpin	*Paricelinus hopliticus*	
Filetail Catshark	*Parmaturus xaniurus*	
English Sole	*Parophrys vetulus*	
Pacific Pompano	*Peprilus simillimus*	
Sharpnose Seaperch	*Phanerodon atripes*	
White Seaperch	*Phanerodon furcatus*	
Saddleback Gunnel	*Pholis ornata*	
Red Gunnel	*Pholis schultzi*	
Hundred-Fathom Codling	*Physiculus rastrelliger*	
Ribbon Prickleback	*Phytichthys chirus*	
Starry Flounder	*Platichthys stellatus*	
Pacific Thornback	*Platyrhinoidis triseriata*	
Bluebarred Prickleback	*Plectobranchus evides*	
C-O Sole	*Pleuronichthys coenosus*	
Curlfin Sole	*Pleuronichthys decurrens*	
Hornyhead Turbot	*Pleuronichthys verticalis*	
Sturgeon Poacher	*Podothecus accipenserinus*	
Plainfin Midshipman	*Porichthys notatus*	
Whitebarred Prickleback	*Poroclinus rothrocki*	

Table G-1. Fish and Reptiles Species List

Common Name	Scientific Name	Federal Status
Crested Bigscale	*Poromitra crassiceps*	
Blue Shark	*Prionace glauca*	
Lumptail Searobin	*Prionotus stephanophrys*	
California Flashlightfish	*Protomyctophum crockeri*	
Bigeye Lanternfish	*Protomyctophum thompsoni*	
Sand Sole	*Psettichthys melanostictus*	
Robust Blacksmelt	*Pseudobathylagus milleri*	
North Pacific Armorhead	*Pseudopentaceros wheeleri*	
Blob Sculpin	*Psychrolutes phrictus*	
Slim Sculpin	*Radulinus asprellus*	
Darter Sculpin	*Radulinus boleoides*	
Big Skate	*Raja binoculata*	
California Skate	*Raja inornata*	
Longnose Skate	*Raja rhina*	
Starry Skate	*Raja stellulata*	
Stripefin Ronquil	*Rathbunella alleni*	
Greenland Halibut	*Reinhardtius hippoglossoides*	
White Suckerfish	*Remora albescens*	
Whalesucker	*Remora australis*	
Remora	*Remora remora*	
Rubberlip Surfperch	*Rhacochilus toxotes*	
Grunt Sculpin	*Rhamphocottus richardsonii*	
Shovelnose Guitarfish	*Rhinobatos productus*	
Blackeye Goby	*Rhinogobiops nicholsii*	
Kelp Clingfish	*Rimicola muscarum*	
Northern Ronquil	*Ronquilus jordani*	
Puget Sound Sculpin	*Ruscarius meanyi*	
Shining Tubeshoulder	*Sagamichthys abei*	
Pacific Bonito	*Sarda chiliensis*	
Pacific Sardine	*Sardinops sagax*	
Pacific Chub Mackerel	*Scomber japonicus*	
Longjaw Bigscale	*Scopeloberyx robustus*	
Twospine Bigscale	*Scopelogadus mizolepis*	
Cabezon Sculpin	*Scorpaenichthys marmoratus*	
Graveldiver	*Scytalina cerdale*	
Rougheye Rockfish	*Sebastes aleutianus*	
Pacific Ocean Perch	*Sebastes alutus*	
Kelp Rockfish	*Sebastes atrovirens*	
Brown Rockfish	*Sebastes auriculatus*	
Aurora Rockfish	*Sebastes aurora*	
Redbanded Rockfish	*Sebastes babcocki*	
Silvergray Rockfish	*Sebastes brevispinis*	
Gopher Rockfish	*Sebastes carnatus*	

Table G-1. Fish and Reptiles Species List

Common Name	Scientific Name	Federal Status
Copper Rockfish	*Sebastes caurinus*	
Greenspotted rockfish	*Sebastes chlorostictus*	
Black-and-Yellow Rockfish	*Sebastes chrysomelas*	
Starry Rockfish	*Sebastes constellatus*	
Darkblotched Rockfish	*Sebastes crameri*	
Calico Rockfish	*Sebastes dallii*	
Splitnose Rockfish	*Sebastes diploproa*	
Greenstriped Rockfish	*Sebastes elongatus*	
Swordspine Rockfish	*Sebastes ensifer*	
Widow Rockfish	*Sebastes entomelas*	
Pink Rockfish	*Sebastes eos*	
Yellowtail rockfish	*Sebastes flavidus*	
Chilipepper	*Sebastes goodei*	
Rosethorn Rockfish	*Sebastes helvomaculatus*	
Squarespot Rockfish	*Sebastes hopkinsi*	
Shortbelly Rockfish	*Sebastes jordani*	
Cowcod	*Sebastes levis*	
Quillback Rockfish	*Sebastes maliger*	
Black Rockfish	*Sebastes melanops*	
Blackgill Rockfish	*Sebastes melanostomus*	
Vermilion Rockfish	*Sebastes miniatus*	
Blue Rockfish	*Sebastes mystinus*	
China Rockfish	*Sebastes nebulosus*	
Tiger Rockfish	*Sebastes nigrocinctus*	
Speckled Rockfish	*Sebastes ovalis*	
Bocaccio	*Sebastes paucispinis*	
Chameleon Rockfish	*Sebastes phillipsi*	
Canary Rockfish	*Sebastes pinniger*	
Redstripe Rockfish	*Sebastes proriger*	
Grass Rockfish	*Sebastes rastrelliger*	
Rosy Rockfish	*Sebastes rosaceus*	
Greenblotched Rockfish	*Sebastes rosenblatti*	
Yelloweye Rockfish	*Sebastes ruberrimus*	
Flag Rockfish	*Sebastes rubrivinctus*	
Bank Rockfish	*Sebastes rufus*	
Stripetail Rockfish	*Sebastes saxicola*	
Halfbanded Rockfish	*Sebastes semicinctus*	
Olive Rockfish	*Sebastes serranoides*	
Pygmy Rockfish	*Sebastes wilsoni*	
Sharpchin Rockfish	*Sebastes zacentrus*	
Shortspine Thornyhead	*Sebastolobus alascanus*	
Longspine Thornyhead	*Sebastolobus altivelis*	
Yellowtail Jack	*Seriola lalandi*	

Table G-1. Fish and Reptiles Species List

Common Name	Scientific Name	Federal Status
Queenfish	*Seriphus politus*	
Sawtooth Snipe Eel	*Serrivomer sector*	
Pacific Sleeper Shark	*Somniosus pacificus*	
Pacific Barracuda	*Sphyraena argentea*	
Night Smelt	*Spirinchus starksi*	
Longfin Smelt	*Spirinchus thaleichthys*	SC
Spiny Dogfish	*Squalus acanthias*	
Pacific Angel Shark	*Squatina californica*	
Pricklebreast Poacher	*Stellerina xyosterna*	
Northern Lampfish	*Stenobrachius leucopsarus*	
Giant Sea Bass	*Stereolepis gigas*	
Dollar Hatchetfishes	*Sternoptyx spp.*	
California Needlefish	*Strongylura exilis*	
California Lanternfish	*Symbolophorus californiensis*	
California tonguefish	*Symphurus atricaudus*	
Manacled Sculpin	*Synchirus gilli*	
Kelp Pipefish	*Syngnathus californiensis*	
Bay Pipefish	*Syngnathus leptorynchus*	
California Lizardfish	*Synodus lucioceps*	
Longfin Dragonfish	*Tactostoma macropus*	
Threadfin Slickhead	*Talismania bifurcata*	
Blue Lanternfish	*Tarletonbeania crenularis*	
Shortbill Spearfish	*Tetrapturus angustirostris*	
Smalleye Squaretail	*Tetrogonurus cuvieri*	
Eulachon	*Thaleichthys pacificus*	
Walleye Pollock	*Theragra chalcogramma*	
Albacore	*Thunnus alalunga*	
Bigeye Tuna	*Thunnus obesus*	
Pacific Bluefin Tuna	*Thunnus orientalis*	
Pacific Electric Ray	*Torpedo californica*	
King-of-the-salmon	*Trachipterus altivelis*	
Jack Mackerel	*Trachurus symmetricus*	
Leopard Shark	*Triakis semifasciata*	
Pacific Sandfish	*Trichodon trichodon*	
Mexican Lampfish	*Triphoturus mexicanus*	
Round Stingray	*Urolophus halleri*	
Blackedge Poacher	*Xeneretmus latifrons*	
Smootheye Poacher	*Xeneretmus leiops*	
Bluespotted Poacher	*Xeneretmus triacanthus*	
Swordfish	*Xiphias gladius*	
Black Prickleback	*Xiphister atropurpureus*	
Rock Prickleback	*Xiphister mucosus*	
Pink Seaperch	*Zalembius rosaceus*	

Table G-1. Fish and Reptiles Species List		
Common Name	**Scientific Name**	**Federal Status**
Shortspine Combfish	*Zaniolepis frenata*	
Longspine Combfish	*Zaniolepis latipinnis*	
Prowfish	*Zaprora silenus*	
REPTILES		
Green Sea Turtle	*Chelonia mydas*	T
Loggerhead Turtle	*Caretta caretta*	T
Leatherback Turtle	*Dermochelys coriacea*	E

Table G-2. Birds and Mammals Species List

Common Name	Scientific Name	Federal Status
BIRDS		
Pacific Loon	*Gavia pacifica*	
Common Loon	*Gavia immer*	
Pied-billed Grebe*	*Podilymbus podiceps*	
Horned Grebe	*Podiceps auritus*	
Red-necked Grebe	*Podiceps grisegena*	
Eared Grebe	*Podiceps nigricollis*	
Western Grebe	*Aechmophorus occidentalis*	
Clark's Grebe	*Aechmophorus clarkii*	
Laysan Albatross*	*Phoebastria immutabilis*	
Black-footed Albatross*	*Phoebastria nigripes*	
Short-tailed Albatross*	*Phoebastria albatrus*	E
Light-mantled Albatross	*Phoebetria palpebrata*	
Shy Albatross	*Thalassarche cauta*	
Northern Fulmar	*Fulmarus glacialis*	
Pink-footed Shearwater	*Puffinus creatopus*	
Flesh-footed Shearwater	*Puffinus carneipes*	
Buller's Shearwater	*Puffinus bulleri*	
Sooty Shearwater	*Puffinus griseus*	
Short-tailed Shearwater	*Puffinus tenuirostris*	
Greater Shearwater	*Puffinus gravis*	
Black-vented Shearwater	*Puffinus opisthomelas*	
Manx Shearwater	*Puffinus puffinus*	
Cook's Petrel	*Pterodroma cookii*	
Mottled Petrel	*Pterodroma inexpectata*	
Dark-rumped Petrel	*Pterodroma phaeopygia*	T
Murphy's Petrel	*Pterodroma ultima*	
Fork-tailed Storm-Petrel*	*Oceanodroma furcata*	
Leach's Storm-Petrel*	*Oceanodroma leucorhoa*	
Ashy Storm-Petrel	*Oceanodroma homochroa*	
Wilson's Storm-Petrel	*Oceanites oceanicus*	
Black Storm-Petrel	*Oceanodroma melania*	
Least Storm-Petrel	*Oceanodroma microsoma*	
Brown Pelican	*Pelecanus occidentalis*	D
American White Pelican	*Pelecanus erythrorhynchos*	
Brandt's Cormorant*	*Phalacrocorax penicillatus*	
Double-crested Cormorant*	*Phalacrocorax auritus*	
Pelagic Cormorant*	*Phalacrocorax pelagicus*	
American Bittern	*Botaurus lentiginosus*	
Great Blue Heron*	*Ardea herodias*	
Great Egret*	*Ardea alba*	
Snowy Egret*	*Egretta thula*	
Green Heron*	*Butorides virescens*	

Table G-2. Birds and Mammals Species List

Common Name	Scientific Name	Federal Status
Black-crowned Night-Heron*	*Nycticorax nycticorax*	
Turkey Vulture*	*Cathartes aura*	
Canada Goose*	*Branta canadensis*	D (B.c. leucopareia)
Brant	*Branta bernicla*	
Gadwall*	*Anas strepera*	
Eurasian Wigeon	*Anas penelope*	
American Wigeon	*Anas americana*	
Mallard*	*Anas platyrhynchos*	
Blue-winged Teal	*Anas discors*	
Cinnamon Teal*	*Anas cyanoptera*	
Northern Shoveler	*Anas clypeata*	
Northern Pintail	*Anas acuta*	
Green-winged Teal	*Anas crecca*	
Greater Scaup	*Aythya marila*	
Lesser Scaup	*Aythya affinis*	
Harlequin Duck	*Histrionicus histrionicus*	
Surf Scoter	*Melanitta perspicillata*	
Black Scoter	*Melanitta nigra*	
Long-tailed Duck (Oldsquaw)	*Clangula hyemalis*	
Bufflehead	*Bucephala albeola*	
Common Goldeneye	*Bucephala clangula*	
Red-breasted Merganser	*Mergus serrator*	
Ruddy Duck*	*Oxyura jamaicensis*	
Osprey*	*Pandion haliaetus*	
Bald Eagle*	*Haliaeetus leucocephalus*	D
Northern Harrier	*Circus cyaneus*	
Merlin	*Falco columbarius*	
Peregrine Falcon*	*Falco peregrinus*	D
Praire Falcon*	*Falco mexicanus*	
American Coot*	*Fulica americana*	
Black-bellied Plover	*Pluvialis squatarola*	
Snowy Plover*	*Charadrius alexandrinus*	T
Semipalmated Plover	*Charadrius semipalmatus*	
Killdeer*	*Charadrius vociferus*	
Black Oystercatcher*	*Haematopus bachmani*	
Greater Yellowlegs	*Tringa melanoleuca*	
Willet	*Catoptrophorus semipalmatus*	
Wandering Tattler	*Heteroscelus incanus*	
Spotted Sandpiper	*Actitis macularia*	
Whimbrel	*Numenius phaeopus*	
Long-billed Curlew	*Numenius americanus*	
Marbled Godwit	*Limosa fedoa*	
Ruddy Turnstone	*Arenaria interpres*	

Table G-2. Birds and Mammals Species List

Common Name	Scientific Name	Federal Status
Black Turnstone	*Arenaria melanocephala*	
Surfbird	*Aphriza virgata*	
Red Knot	*Calidris canutus*	
Sanderling	*Calidris alba*	
Western Sandpiper	*Calidris mauri*	
Least Sandpiper	*Calidris minutilla*	
Rock Sandpiper	*Calidris ptilocnemis*	
Dunlin	*Calidris alpina*	
Short-billed Dowitcher	*Limnodromus griseus*	
Long-billed Dowitcher	*Limnodromus scolopaceus*	
Red-necked Phalarope	*Phalaropus lobatus*	
Red Phalarope	*Phalaropus fulicaria*	
South Polar Skua	*Catharacta maccormicki*	
Pomarine Jaeger	*Stercorarius pomarinus*	
Parasitic Jaeger	*Stercorarius parasiticus*	
Long-tailed Jaeger	*Stercorarius longicaudus*	
Bonaparte's Gull	*Larus philadelphia*	
Heermann's Gull	*Larus heermanni*	
Mew Gull	*Larus canus*	
Ring-billed Gull*	*Larus delawarensis*	
California Gull*	*Larus californicus*	
Herring Gull	*Larus argentatus*	
Thayer's Gull	*Larus thayeri*	
Western Gull*	*Larus occidentalis*	
Glaucous-winged Gull	*Larus glaucescens*	
Glaucous Gull	*Larus hyperboreus*	
Sabine's Gull	*Xema sabini*	
Black-legged Kittiwake	*Rissa tridactyla*	
Caspian Tern*	*Sterna caspia*	
Elegant Tern*	*Sterna elegans*	
Common Tern	*Sterna hirundo*	
Arctic Tern	*Sterna paradisaea*	
Forster's Tern*	*Sterna forsteri*	
Sooty Tern	*Sterna fuscata*	
Common Murre*	*Uria aalge*	
Thick-billed Murre	*Uria lomvia*	
Pigeon Guillemot*	*Cepphus columba*	
Marbled Murrelet*	*Brachyramphus marmoratus*	T
Scripps's Murrelet	*Synthliboramphus scrippsi*	
Ancient Murrelet	*Synthliboramphus antiquus*	
Cassin's Auklet*	*Ptychoramphus aleuticus*	
Rhinoceros Auklet*	*Cerorhinca monocerata*	
Horned Puffin	*Fratercula corniculata*	

Table G-2. Birds and Mammals Species List

Common Name	Scientific Name	Federal Status
Tufted Puffin*	*Fratercula cirrhata*	
Short-eared Owl	*Asio flammeus*	
Belted Kingfisher*	*Ceryle alcyon*	
Black Phoebe*	*Sayornis nigricans*	
Say's Phoebe	*Sayornis saya*	
Common Raven*	*Corvus corax*	
Horned Lark*	*Eremophila alpestris*	
Tree Swallow*	*Tachycineta bicolor*	
Northern Rough-winged Swallow*	*Stelgidopteryx serripennis*	
Cliff Swallow*	*Petrochelidon pyrrhonota*	
Barn Swallow*	*Hirundo rustica*	
Rock Wren*	*Salpinctes obsoletus*	
Marsh Wren	*Cistothorus palustris*	
American Pipit	*Anthus rubescens*	
Yellow-rumped Warbler	*Dendroica coronata*	
Savannah Sparrow*	*Passerculus sandwichensis*	
Song Sparrow*	*Melospiza melodia*	
Red-winged Blackbird*	*Agelaius phoeniceus*	
Tricolored Blackbird*	*Agelaius tricolor*	
Western Meadowlark*	*Sturnella neglecta*	
MAMMALS		
Blue Whale	*Balaenoptera musculus*	E
Fin Whale	*Balaenoptera physalus*	E
Minke Whale	*Balaenoptera acutorostrata*	
Humpback Whale	*Megaptera novaeangliae*	E
Gray Whale	*Eschrichtius robustus*	D
Harbor Porpoise*	*Phocoena phocoena*	
Dall's Porpoise*	*Phocoenoides dalli*	
Pacific White-sided Dolphin*	*Lagenorhynchus obliquidens*	
Northern Right Whale Dolphin*	*Lissodelphis borealis*	
Striped Dolphin	*Stenella coeruleoalba*	
Risso's Dolphin*	*Grampus griseus*	
Killer Whale*	*Orcinus orca*	E**
Short-finned Pilot Whale	*Globicephala macrorhynchus*	
Sperm Whale	*Physeter macrocephalus*	E
Cuvier's Beaked Whale	*Ziphius cavirostris*	
Baird's Beaked Whale*	*Berardius bairdii*	
Steller Sea Lion*	*Eumetopius jubatus*	***
California Sea Lion	*Zalophus californianus*	
Northern Fur Seal	*Callorhinus ursinus*	
Guadalupe Fur Seal	*Arctocephalus townsendi*	T
Northern Elephant Seal	*Mirounga angustirostris*	
Harbor Seal*	*Phoca vitulina richardii*	

Table G-2. Birds and Mammals Species List

Common Name	Scientific Name	Federal Status
Southern Sea Otter	*Enhydra lutris nereis*	T
River Otter*	*Lontra canadensis*	

* Denotes use of sanctuary for foraging, roosting, nesting, and/or rearing of young during breeding season.

** In 2006, the Distinct Population Segment of southern killer whales (Orcinus orca) was designated as Endangered under the MMPA and ESA. Recent anecdotal information suggests that some of the migratory and feeding killer whales within the GFNMS, CBNMS and MBNMS maybe be part of this DPS and therefore have been noted as Endangered in the species inventory.

*** Critical habitat for Steller sea lions includes the rookeries at Año Nuevo Island within the MBNMS and South Farallon Islands within the GFNMS (see 50 CFR 226.202(b) and Table 1 to Part 226).

Table G-3. Invertebrates Species List	
Common Name	**Scientific Name**
MONERA	
Bacterial mat	*Beggiotoa*
PORIFERA	
Red volcano sponge	*Acarnus erithacus*
Sponge	*Antho lithophoenix*
Glass sponge	*Aphrocallistes vastus*
Sponge	*Aplysilla glacialis*
Sponge	*Aplysilla polyraphis*
Predatory sponges	*Asbestopluma*
Sponge	*Clathria (Microciona) spongigartina*
Sponge	*Clathria (Thalysias) originalis*
Sponge	*Clathria microjoanna*
Sponge	*Clathria spongigartina*
Sponge	*Dysidea fragilis*
Sponge	*Endectyon hyle*
Sponge	*Forcepia (Forcepia) elvini*
Sponge	*Geodia agassizi*
Sponge	*Geodia gibberosa*
Sponge	*Geodia mesotriaena*
Sponge	*Guitarra abbotti*
Bread crumb sponge	*Halichondria panicea*
Sponge	*Haliclona textapatina*
Glass sponge	*Heterochone calyx*
Sponge	*Hymeniacidon sinapium*
Sponge	*Iophon lamella*
Sponge	*Iophon nigricans*
Sponge	*Leucandra heathi*
Sponge	*Leucandra losangelensis*
Sponge	*Leucilla nuttingi*
Sponge	*Leucosolenia eleanor*
Sponge	*Lissodendoryx (Lissodendoryx) topsenti*
Sponge	*Lissodendoryx firma*
Sponge	*Lissodendoryx kyma*
Sponge	*Mycale adhaerens*
Sponge	*Mycale lingua*
Sponge	*Mycale psila*
Sponge	*Mycale toporoki*
Sponge	*Myxilla incrustans*
Sponge	*Myxilla parasitica*
Sponge	*Neopetrosia problematica*
Sponge	*Neopetrosia zumi*
Sponge	*Penares cortius*
Sponge	*Poecillastra rickettsi*

Table G-3. Invertebrates Species List

Common Name	Scientific Name
Aggregate vase sponge	*Polymastia pachymastia*
Sponge	*Sidonops bicolor*
Gray moon sponge	*Spheciospongia confoederata*
Glass sponge	*Staurocalyptus fasciculatus*
White sponge	*Stelletta clarella*
Sponge	*Stelletta estrella*
Sponge	*Tedania gurjanovae*
Sponge	*Tethya aurantium*
Sponge	*Tethya californiana*
Sponge	*Xestospongia diprosopia*
Sponge	*Xestospongia edapha*
CNIDARIA	
Anemone	*Actinauge verrilli*
Siphonophore	*Agalma elegans*
Pink helmet	*Aglantha digitale*
thecate hydroids	*Aglaophenia inconspicua*
Thecate hydroids	*Aglaophenia latirostris*
Jellyfish	*Aglaura hemistoma*
Siphonophore	*Amphicaryon ernesti*
Mushroom coral	*Anthomastus ritteri*
Anemone	*Anthopleura artemisia*
Aggregating anemone	*Anthopleura elegantissima*
Starburst anemone	*Anthopleura sola*
Giant green anemone	*Anthopleura xanthogrammica*
Sea pen	*Anthoptilum grandiflorum*
Moon jelly	*Aurelia aurita*
Orange cup coral	*Balanophyllia elegans*
Cup coral	*Caryophyllia alaskensis*
Cup coral	*Caryophyllia arnoldi*
Siphonophore	*Chelophyes appendiculata*
Soft coral	*Chromoplexaura marki*
Purple-striped jelly	*Chrysaora colorata*
Pacific sea nettle	*Chrysaora fuscescens*
Northern Sea nettle	*Chrysaora melanaster*
Siphonophore	*Chuniphyes multidentata*
Thecate hydroids	*Clytia gregaria*
Cup coral	*Coenocyathus bowersi*
Silky medusa	*Colobonema sericeum*
Strawberry anemone	*Corynactis californica*
Lion's mane	*Cyanea capillata*
Cup coral	*Desmophyllum dianthus*
Siphonophore	*Diphyes bojani*
Siphonophore	*Diphyes dispar*

Table G-3. Invertebrates Species List	
Common Name	**Scientific Name**
Siphonophore	*Dromalia alexandri*
Thecate hydroids	*Earleria cellularia*
Proliferating anemone	*Epiactis prolifera*
Orange zoanthid	*Epizoanthus scotinus*
Siphonophore	*Eudoxoides mitra*
Thecate hydroids	*Eutonina indicans*
Orange hydroid	*Garveia annulata*
Sea pen	*Halipteris californica*
Cup coral	*Javania californica*
Cup coral	*Labyrinthocyathus quaylei*
Red gorgonian	*Leptogorgia chilensis*
Tentacle shedding anemone	*Liponema brevicornis*
Jellyfish	*Liriope tetraphylla*
White plumed anemone	*Metridium farcimen*
Clonal plumose anemone	*Metridium senile*
Siphonophore	*Muggiaea atlantica*
Siphonophore	*Nanomia bijuga*
Coral	*Oculina profunda*
Anemone	*Paractinostola faeculenta*
Cup coral	*Paracyathus stearnsii*
Bubblegum coral	*Paragorgia arborea*
Primnoid corals	*Parastenella*
Purple-striped jelly	*Pelagia colorata*
Crown jellyfish	*Periphylla periphylla*
Primnoid coral	*Plumarella longispina*
Sea pen	*Ptilosarcus gurneyi*
Siphonophore	*Sphaeronectes gracilis*
Hydrozoan coral	*Stylantheca papillosa*
Lace coral	*Stylantheca porphyra*
California hydrocoral	*Stylaster californicus*
Lace coral	*Stylaster venustus*
Sea pen	*Stylatula gracilis*
Siphonophore	*Sulculeolaria biloba*
Red gorgonian coral	*Swiftia kofoidi*
Jellyfish	*Tetraplatia volitans*
Northern red anemone	*Urticina felina*
Anemone	*Urticina lofotensis*
Fish-eating anemone	*Urticina piscivora*
By-the-wind sailor	*Velella velella*
Siphonophore	*Vogtia pentacantha*
ANNELIDA	
Polychaete worm	*Arabella iricolor*
Polychaete worm	*Arctonoe fragilis*

Table G-3. Invertebrates Species List

Common Name	Scientific Name
Polychaete worm	*Arctonoe vittata*
Polychaete worm	*Bispira volutacornis*
Polychaete worm	*Dodecaceria fewkesi*
Polychaete worm	*Eudistylia polymorpha*
Polychaete worm	*Eulalia bilineata*
Polychaete worm	*Eunice multipectinata*
Polychaete worm	*Eunice vittata*
Polychaete worm	*Eunoe barbata*
Polychaete worm	*Eunoe senta*
Polychaete worm	*Euphrosine arctia*
Polychaete worm	*Euphrosine dumosa*
Polychaete worm	*Ficopomatus enigmaticus*
Polychaete worm	*Genetyllis castanea*
Polychaete worm	*Glycera tesselata*
Polychaete worm	*Halosydna brevisetosa*
Polychaete worm	*Harmothoe extenuata*
Polychaete worm	*Harmothoe fragilis*
Polychaete worm	*Harmothoe hirsuta*
Polychaete worm	*Lepidasthenia longicirrata*
Polychaete worm	*Lepidonotus caelorus*
Polychaete worm	*Lepidonotus spiculus*
Polychaete worm	*Lepidonotus squamatus*
Polychaete worm	*Lumbrineris inflata*
Polychaete worm	*Lumbrineris japonica*
Polychaete worm	*Lumbrineris latreilli*
Polychaete worm	*Nereiphylla castanea*
Polychaete worm	*Nereis eakini*
Polychaete worm	*Nereis grubei*
Polychaete worm	*Nereis pelagica*
Polychaete worm	*Pholoides asperus*
Polychaete worm	*Phyllochaetopterus prolifica*
Polychaete worm	*Platynereis magalhaensis*
Polychaete worm	*Polydora alloporis*
Polychaete worm	*Rhynchonerella angelini*
Polychaete worm	*Serpula columbiana*
Polychaete worm	*Serpula vermicularis*
Polychaete worm	*Sige bifoliata*
Polychaete worm	*Spirorbis spirorbis*
Polychaete worm	*Syllis armillaris*
Polychaete worm	*Thelepus crispus*
Polychaete worm	*Tomopteris cavalli*
Polychaete worm	*Tomopteris pacifica*
Polychaete worm	*Tomopteris septentrionalis*

Table G-3. Invertebrates Species List	
Common Name	**Scientific Name**
Polychaete worm	*Trypanosyllis aeolis*
Polychaete worm	*Trypanosyllis intermedia*
Polychaete worm	*Vanadis longissima*
MOLLUSCA	
Squid	*Abraliopsis felis*
Divaricate nutclam	*Acila castrensis*
Corded white limpet	*Acmaea funiculata*
Whitecap limpet	*Acmaea mitra*
Harp baby-bubble	*Acteocina harpa*
Gastropod	*Alvania almo*
Gastropod	*Alvania compacta*
Gastropod	*Alvania dinora*
Santa Rosa alvania	*Alvania purpurea*
Gastropod	*Alvania rosana*
Two-tone amphissa	*Amphissa bicolor*
Wrinkled amphissa	*Amphissa columbiana*
Variegate amphissa	*Amphissa versicolor*
Lyre scissurelle	*Anatoma lyra*
Pacific sea-lemon	*Anisodoris nobilis*
Peruvian jingle	*Anomia peruviana*
Bivalve	*Argopecten irradians concentricus*
Nudibranch	*Armina cordellensis*
Acute barleysnail	*Barleeia acuta*
Gastropod	*Barleeia haliotiphila*
Gastropod	*Barleeia subtenuis*
Gastropod	*Bathybembix bairdii*
Magister armhook squid	*Berryteuthis magister*
California side gill slug	*Berthella californica*
Gastropod	*Bittiolum alternatum*
Ribbed trophon	*Boreotrophon multicostatus*
Turban whelk	*Buccinum viridum*
Yellow-edged nudibranch	*Cadlina luteomarginata*
Modest cadlina	*Cadlina modesta*
California caecum	*Caecum californicum*
Many-named caecum	*Caecum crebricinctum*
Western caecum	*Caecum occidentale*
Purple-ring topsnail	*Calliostoma annulatum*
Channeled topsnail	*Calliostoma canaliculatum*
Blue topsnail	*Calliostoma ligatum*
Granulose topsnail	*Calliostoma supragranosum*
Chiton	*Callistochiton palmulatus*
Gastropod	*Cancellaria cooperii*
Gastropod	*Carinaria japonica*

Table G-3. Invertebrates Species List

Common Name	Scientific Name
Three-tooth cavoline	*Cavolinia tridentata*
Foliate thornmouth	*Ceratostoma foliatum*
Secret jewelbox	*Chama arcana*
California venus	*Chione californiensis*
Squid	*Chiroteuthis calyx*
Squid	*Chiroteuthis veranyi*
Spiny scallop	*Chlamys hastata*
Reddish scallop	*Chlamys rubida*
Gastropod	*Clathromangelia interfossa*
Pyramid clio	*Clio pyramidata*
Sea angel	*Clione limacina*
Yellow limpet	*Collisella ochracea*
Oblique whelk	*Colus aphelus*
Gastropod	*Colus trophius*
Atlantic corolla	*Corolla calceola*
Spectacular corolla	*Corolla spectabilis*
Hood puncturella	*Cranopsis cucullata*
Giant rock-scallop	*Crassadoma gigantea*
Cross-sculpture crenella	*Crenella decussata*
Hooked slipper snail	*Crepidula adunca*
Western white slipper snail	*Crepidula perforans*
Pacific half-slippersnail	*Crepipatella lingulata*
Gumboot chiton	*Cryptochiton stelleri*
California softshell clam	*Cryptomya californica*
Bumpy cyclocardia	*Cyclocardia bailyi*
Stout cyclocardia	*Cyclocardia ventricosa*
Santa Barbara glass-scallop	*Cyclopecten barbarensis*
Gastropod	*Cymakra aspera*
Gastropod	*Cymakra gracilior*
Bivalve	*Delectopecten tillamookensis*
Vancouver scallop	*Delectopecten vancouverensis*
Gastropod	*Desmopterus papilio*
California paperbubble	*Diaphana californica*
Ringed doris	*Diaulula sandiegensis*
Neat-rib keyhole limpet	*Diodora arnoldi*
Rough keyhole limpet	*Diodora aspera*
Orb diplodon	*Diplodonta orbella*
Painted nudibranch	*Dirona picta*
Gastropod	*Dolichupis ritteri*
Humbolt squid	*Dosidicus gigas*
Gastropod	*Epitonium indianorum*
Gastropod	*Epitonium tinctum*
Appleseed erato	*Erato vitellina*

Table G-3. Invertebrates Species List

Common Name	Scientific Name
Gastropod	*Euspira lewisii*
Spanish shawl	*Flabellina iodinea*
Nudibracnh	*Flabellina trilineata*
Painted spindle	*Fusinus luteopictus*
Oregon triton	*Fusitriton oregonensis*
Squid	*Galiteuthis phyllura*
California sunsetclam	*Gari californica*
Gritty doris	*Geitodoris heathi*
Triangular marginella	*Gibberula subtrigona*
Ford venus	*Globivenus fordii*
California bittersweet	*Glycymeris subobsoleta*
Gastropod	*Glyphostoma canfieldi*
Squid	*Gonatopsis borealis*
Clawed armhook squid	*Gonatus onyx*
Pear marginella	*Granulina margaritula*
Chenu mussel	*Gregariella chenui*
Black abalone	*Haliotis cracherodii*
Pinto abalone	*Haliotis kamtschatkana*
Red abalone	*Haliotis rufescens*
Chiton	*Hanleyella oldroydi*
Hermissenda	*Hermissenda crassicornis*
Pigeon erato	*Hespererato columbella*
Arctic hiatella	*Hiatella arctica*
Squid	*Histioteuthis hoylei*
Berry dwarf-turban	*Homalopoma baculum*
Gastropod	*Homalopoma berryi*
Gastropod	*Homalopoma lacunatum*
Dark dwarf-turban	*Homalopoma luridum*
Gastropod	*Homalopoma mimicum*
Few-rib dwarf-turban	*Homalopoma paucicostatum*
Rayed dwarf-turban	*Homalopoma radiatum*
Kennerley venus	*Humilaria kennerleyi*
Gastropod	*Iothia lindbergi*
Lamellar venus	*Irusella lamellifera*
Black leather chiton	*Katharina tunicata*
Suborbicular kellyclam	*Kellia suborbicularis*
Gastropod	*Kurtziella beta*
Chink snail	*Lacuna marmorata*
Gastropod	*Lacuna porrecta*
Gastropod	*Lacuna unifasciata*
San Diego lamellaria	*Lamellaria diegoensis*
Bivalve	*Lasaea subviridis*
San Diego scallop	*Leopecten diegensis*

Table G-3. Invertebrates Species List

Common Name	Scientific Name
Chiton	*Lepidochitona flectens*
Chiton	*Lepidozona radians*
Chiton	*Lepidozona retiporosa*
Chiton	*Lepidozona scabricostata*
Chiton	*Lepidozona willetti*
Chiton	*Leptochiton alveolus*
Chiton	*Leptochiton belknapi*
Chiton	*Leptochiton rugatus*
Pacific littleneck clam	*Leukoma staminea*
Helicid pteropod	*Limacina helicina*
Hemphill fileclam	*Limaria hemphilli*
Gastropod	*Lirobittium purpureum*
Sharp-rib lirularia	*Lirularia acuticostata*
Few-spot lirularia	*Lirularia parcipicta*
Feather datemussel	*Lithophaga plumula*
Periwinkle	*Littorina keenae*
Checkered periwinkle	*Littorina scutulata*
Periwinkle	*Littorina sitkana*
California market squid	*Loligo opalescens*
Black limpet	*Lottia asmi*
Ribbed limpet	*Lottia digitalis*
Owl limpet	*Lottia gigantea*
Limpet	*Lottia insessa*
Unstable seaweed limpet	*Lottia instabilis*
File limpet	*Lottia limatula*
Shield limpet	*Lottia pelta*
Limpet	*Lottia persona*
Rough limpet	*Lottia scabra*
Limpet	*Lottia scutum*
Limpet	*Lottia strigatella*
Triangular limpet	*Lottia triangularis*
Bivalve	*Lucinoma annulata*
Farallon cyclostreme	*Macrarene farallonensis*
California macromphaline	*Macromphalina californica*
Pacific rosy margarite	*Margarites rhodia*
Salmon margarite	*Margarites salmoneus*
Gastropod	*Megatebennus bimaculatus*
Auburn eulima	*Melanella rutila*
Gastropod	*Melanella thersites*
Gastropod	*Metaxia convexa*
Short baby-bubble	*Microglyphis brevicula*
Tiny pouchclam	*Milneria minima*
Elongate carditid	*Miodontiscus prolongatus*

Table G-3. Invertebrates Species List

Common Name	Scientific Name
Half-pitted miter	*Mitra idae*
Variegate dovesnail	*Mitrella tuberosa*
Gastropod	*Mitromorpha gracilior*
Fat horsemussel	*Modiolus capax*
California horsemussel	*Modiolus carpenteri*
Bag horsemussel	*Modiolus sacculifer*
Nudibranch	*Montereina nobilis*
Hairy chiton	*Mopalia ciliata*
Chiton	*Mopalia egretta*
Chiton	*Mopalia imporcata*
Mossy chiton	*Mopalia muscosa*
Robust clubhook squid	*Moroteuthis robusta*
Pygmy mussel	*Musculus pygmaeus*
California mussel	*Mytilus californianus*
California mussel	*Mytilus zonarius*
Smooth western nassa	*Nassarius insculptus*
Gastropod	*Nassarius mendicus*
Hundred-line cockle	*Nemocardium centifilosum*
Gastropod	*Neptunea amianta*
Channelled dog welk	*Nucella canaliculata*
Emarginate dog welk	*Nucella emarginata*
Chiton	*Nuttallina californica*
Purple rocksnail	*Ocinebrina atropurpurea*
Gastropod	*Ocinebrina interfossa*
Lurid rocksnail	*Ocinebrina lurida*
Squid	*Octopoteuthis deletron*
North Pacific bigeye octopus	*Octopus californicus*
North Pacific giant octopus	*Octopus dofleini*
Smoothskin octopus	*Octopus leioderma*
East Pacific red octopus	*Octopus rubescens*
Nudibracnh	*Okenia rosacea*
Beatic dwarf olive	*Olivella baetica*
Red flying squid	*Ommastrephes bartramii*
Leather limpet	*Onchidella borealis*
Boreal clubhook squid	*Onychoteuthis borealijaponicus*
Gastropod	*Opalia wroblewskyi*
Octopus	*Opisthoteuthis californiana*
Sharp-rib cyclostreme	*Parviturbo acuticostatus*
California pedicularia	*Pedicularia californica*
Bivalve	*Penitella conradi*
Monterey wormsnail	*Petaloconchus montereyensis*
California petricolid	*Petricola californiensis*
Bivalve	*Petricola carditoides*

Table G-3. Invertebrates Species List

Common Name	Scientific Name
Bivalve	*Philobrya setosa*
Chiton	*Placiphorella atlantica*
Gastropod	*Pleurobranchaea californica*
Alaska jingle	*Pododesmus macrochisma*
Red turban	*Pomaulax gibberosus*
Pacific jewelbox	*Pseudochama exogyra*
Deep jewelbox	*Pseudochama granti*
Frill-wing murex	*Pteropurpura macroptera*
Hood puncturella	*Puncturella cucullata*
Dot-rib puncturella	*Puncturella punctocostata*
Gastropod	*Rictaxis punctocaelatus*
Gastropod	*Rissoina hannai*
Gastropod	*Rissoina newcombei*
North Pacific bobtail squid	*Rossia pacifica*
Elegant emarginula	*Scelidotoma bella*
Gastropod	*Seila montereyensis*
Rose-painted semele	*Semele rubropicta*
Sharp-rib semele	*Semele venusta*
Scaled wormsnail	*Serpulorbis squamiger*
Rim scissurelle	*Sinezona rimuloides*
Lovely pacific solarelle	*Solariella peramabilis*
Brown turban snail	*Tegula brunnea*
Black tegula	*Tegula funebralis*
Lined chiton	*Tonicella lineata*
Lined chiton	*Tonicella lokii*
Fat gaper	*Tresus capax*
Reticulate button snail	*Trimusculus reticulatus*
Clown nudibranch	*Triopha catalinae*
Speckled nudibranch	*Triopha maculata*
San Pedro triphora	*Triphora pedroana*
Rosy tritonia	*Tritonia diomedea*
California trivia	*Trivia californiana*
Gastropod	*Trivia ritteri*
Gastropod	*Trophonopsis stuarti*
Vampire squid	*Vampyroteuthis infernalis*
Granular lamellaria	*Velutina granulata*
Smooth lamellaria	*Velutina velutina*
Shield false limpet	*Williamia peltoides*
ARTHROPODA	
Spiny lithode crab	*Acantholithodes hispidus*
Mysid shrimp	*Acanthomysis*
Copepod	*Acartia danae*
Copepod	*Acartia hudsonica*

Table G-3. Invertebrates Species List

Common Name	Scientific Name
Copepod	*Acartia longiremis*
Copepod	*Acartia tonsa*
Sea spider	*Achelia chelata*
Sea spider	*Achelia spinoseta*
Copepod	*Aetideus bradyi*
Copepod	*Aetideus divergens*
Mysid shrimp	*Alienacanthomysis macropsis*
Twistclaw pistol shrimp	*Alpheus clamator*
Shrimp	*Alpheus dentipes*
Sea spider	*Ammothea hilgendorfi*
Barnacle	*Amphibalanus amphitrite*
Copepod	*Arietellus plumifer*
Copepod	*Arietellus setosus*
Barnacles	*Armatobalanus nefrens*
Copepod	*Augaptilus glacialis*
Barnacle	*Balanus glandula*
Barnacles	*Balanus nubilus*
Burkenroad blunt-tail shrimp	*Bentheogennema burkenroadi*
Spiny mole crab	*Blepharipoda occidentalis*
Amphipod	*Brachyscelus crusculum*
Copepod	*Bradyidius similis*
Copepod	*Calanus marshallae*
Copepod	*Calanus pacificus*
Copepod	*Caligus clemensi*
Copepod	*Caligus macarovi*
Copepod	*Calocalanus pavo*
Copepod	*Calocalanus pavoninus*
Copepod	*Calocalanus styliremis*
Pacific rock crab	*Cancer antennarius*
Dungeness crab	*Cancer magister*
Pygmy rock crab	*Cancer oregonensis*
Red rock crab	*Cancer productus*
Copepod	*Candacia bipinnata*
Copepod	*Candacia columbiae*
Skeleton shrimp	*Caprella californica*
Green crab	*Carcinus maenas*
Copepod	*Centropages abdominalis*
Copepod	*Centropages bradyi*
Grooved Tanner crab	*Chionoecetes tanneri*
Longhorn decorator crab	*Chorilia longipes*
Barnacle	*Chthamalus dalli*
Isopod	*Cirolana harfordi*
Copepod	*Clausocalanus arcuicornis*

Table G-3. Invertebrates Species List

Common Name	Scientific Name
Copepod	*Clausocalanus furcatus*
Copepod	*Clausocalanus lividus*
Copepod	*Clausocalanus parapergens*
Ostracod	*Conchoecetta acuminata*
Ostracod	*Conchoecia macrocheira*
Ostracod	*Conchoecia magna*
Ostracod	*Conchoecilla daphnoides*
Copepod	*Corycaeus anglicus*
Copepod	*Corycaeus flaccus*
Bay shrimp	*Crangon nigromaculata*
Copepod	*Ctenocalanus vanus*
Ostracod	*Discoconchoecia elegans*
Amphipod	*Elasmopus antennatus*
Amphipod	*Elasmopus serraticus*
Pacific sand crab	*Emerita analoga*
Copepod	*Epilabidocera amphitrites*
Striped eualid	*Eualus lineatus*
Copepod	*Eucalanus bungii*
Copepod	*Eucalanus californicus*
Copepod	*Eucalanus hyalinus*
Copepod	*Euchaeta elongata*
Copepod	*Euchaeta media*
Copepod	*Euchirella curticauda*
Copepod	*Euchirella grandicornis*
Copepod	*Euchirella pseudopulchra*
Copepod	*Euchirella rostrata*
Krill	*Euphausia pacifica*
Krill	*Euphausia recurva*
Isopod	*Exosphaeroma inornata*
Grooved mussel crab	*Fabia subquadrata*
Copepod	*Gaetanus minor*
Copepod	*Gaetanus pungens*
Copepod	*Haloptilus longicornis*
Furry crab	*Hapalogaster cavicauda*
Purple shore crab	*Hemigrapsus nudus*
Barred shrimp	*Heptacarpus pugettensis*
Slender coastal shrimp	*Heptacarpus tenuissimus*
Copepod	*Heterorhabdus papilliger*
Copepod	*Heterorhabdus tanneri*
Copepod	*Heterostylites longicornis*
Mysid shrimp	*Holmesiella anomala*
Amphipod	*Hyale grandicornis*
Amphipod	*Hyperia medusarum*

Table G-3. Invertebrates Species List

Common Name	Scientific Name
Amphipod	*Hyperoche mediterranea*
Amphipod	*Hyperoche medusarum*
Isopod	*Ianiropsis kincaidi*
Isopod	*Idotea fewkesi*
Isopod	*Idotea urotoma*
Mysid shrimp	*Inusitatomysis insolita*
Isopod	*Janiralata occidentalis*
Isopod	*Joeropsis dubia*
Tanaid	*Leptochelia savignyi*
Amphipod	*Leucothoe spinicarpa*
Isopod	*Ligia occidentalis*
Isopod	*Ligia pallasii*
Isopod	*Limnoria algarum*
Scarlet king crab	*Lithodes couesi*
Isopod	*Littorophiloscia richardsonae*
Brown box crab	*Lopholithodes foraminatus*
Blackclaw crestleg crab	*Lophopanopeus bellus*
Crab	*Lophopanopeus leucomanus*
Copepod	*Lophothrix frontalis*
Moss crab	*Loxorhynchus crispatus*
Sheep crab	*Loxorhynchus grandis*
Copepod	*Lucicutia flavicornis*
Copepod	*Lucicutia longicornis*
Amphipod	*Lycaea pulex*
Copepod	*Mecynocera tenuis*
Barnacle	*Megabalanus californicus*
Copepod	*Mesocalanus tenuicornis*
Copepod	*Metridia pacifica*
Ostracod	*Mikroconchoecia acuticosta*
Squat lobster	*Munida quadrispina*
Isopod	*Munna spinifrons*
Isopod	*Munna stephenseni*
Krill	*Nematobrachion flexipes*
Krill	*Nematoscelis difficilis*
Copepod	*Neocalanus cristatus*
Copepod	*Neocalanus plumchrus*
Krill	*Nyctiphanes simplex*
Sea spider	*Nymphopsis spinosissimum*
Decapod	*Oedignathus inermis*
Copepod	*Oithona atlantica*
Copepod	*Oithona similis*
Amphipod	*Oligochinus lighti*
Amphipod	*Opisa tridentata*

Table G-3. Invertebrates Species List

Common Name	Scientific Name
Graceful decorator crab	*Oregonia gracilis*
Ostracod	*Orthoconchoecia striola*
Amphipod	*Oxycephalus clausi*
Left handed hermit crab	*Paguristes ulreyi*
Knobbyhand hermit	*Pagurus confragosus*
Hermit crab	*Pagurus hirsutiusculus*
Hermit crab	*Pagurus samoensis*
Sidestriped shrimp	*Pandalopsis dispar*
Dock shrimp	*Pandalus danae*
Humpy shrimp	*Pandalus goniurus*
Coonstriped shrimp	*Pandalus hypsinotus*
Ocean shrimp	*Pandalus jordani*
Spot shrimp	*Pandalus platyceros*
Roughpatch shrimp	*Pandalus stenolepis*
Yellowleg pandalid	*Pandalus tridens*
Copepod	*Paracalanus indicus*
Copepod	*Paracalanus parvus*
Isopod	*Paracerceis cordata*
California king crab	*Paralithodes californiensis*
Spiny king crab	*Paralithodes rathbuni*
Amphipod	*Parallorchestes ochotensis*
Amphipod	*Paraphronima crassipes*
Amphipod	*Paraphronima gracilis*
Copepod	*Pareucalanus parki*
Pacific glass shrimp	*Pasiphaea pacifica*
Crimson pasiphaeid	*Pasiphaea tarda*
Isopod	*Pentidotea resecata*
Isopod	*Pentidotea stenops*
Isopod	*Pentidotea wosnesenskii*
Amphipod	*Phronima sedentaria*
Amphipod	*Phronimopsis spinifera*
Armed box crab	*Platymera gaudichaudii*
Copepod	*Pleuromamma borealis*
Copepod	*Pleuromamma quadrungulata*
Copepod	*Pleuromamma robusta*
Copepod	*Pleuromamma scutullata*
Copepod	*Pleuromamma xiphias*
Pelagic red crab	*Pleuroncodes planipes*
Gooseneck barnacle	*Pollicipes polymerus*
Amphipod	*Polycheria osborni*
Amphipod	*Primno abyssalis*
Amphipod	*Primno brevidens*
Copepod	*Pseudocalanus mimus*

Table G-3. Invertebrates Species List

Common Name	Scientific Name
Copepod	*Pseudocalanus minutus*
Copepod	*Pseudocalanus moultoni*
Graceful kelp crab	*Pugettia gracilis*
Northern kelp crab	*Pugettia producta*
Cryptic kelp crab	*Pugettia richii*
Sea spider	*Pycnogonum stearnsi*
Copepod	*Racovitzanus antarcticus*
Copepod	*Rhincalanus nasutus*
California rock crab	*Romaleon antennarium*
Copepod	*Sapphirina nigromaculata*
Amphipod	*Scina nana*
Copepod	*Scolecithricella minor*
Copepod	*Scolecithricella ovata*
Copepod	*Scolecithrix bradyi*
Copepod	*Scolecithrix danae*
Copepod	*Scottocalanus persecans*
Sharpnose crab	*Scyra acutifrons*
Barnacle	*Semibalanus cariosus*
Prawn	*Sergestes similis*
Barnacle	*Solidobalanus engbergi*
Offshore blade shrimp	*Spirontocaris sica*
Amphipod	*Streetsia challengeri*
Grady's cave amphipod	*Stygobromus gradyi*
Krill	*Stylocheiron abbreviatum*
Krill	*Stylocheiron longicorne*
Littoral pistol shrimp	*Synalpheus lockingtoni*
Krill	*Tessarabrachion oculatum*
Amphipod	*Themisto pacifica*
Krill	*Thysanoessa gregaria*
Krill	*Thysanoessa inspinata*
Krill	*Thysanoessa spinifera*
Copepod	*Tortanus discaudatus*
Copepod	*Triconia conifera*
Amphipod	*Tryphana malmi*
Copepod	*Undeuchaeta intermedia*
Copepod	*Undeuchaeta plumosa*
Isopod	*Uromunna ubiquita*
Amphipod	*Vibilia armata*
Amphipod	*Vibilia australis*
Amphipod	*Vibilia stebbingi*
ECHINODERMATA	
Brittle star	*Amphiodia akosmos*
Brittle star	*Amphiodia occidentalis*

Table G-3. Invertebrates Species List

Common Name	Scientific Name
Brittle star	*Amphipholis squamata*
Brittle star	*Asteronyx loveni*
Sea star	*Astropecten verrilli*
Sea urchin	*Brisaster latifrons*
Sea star	*Ceramaster japonicus*
Sea star	*Ceramaster leptoceramus*
Cookie cutter star	*Ceramaster patagonicus*
Sea star	*Crossaster borealis*
Sea star	*Ctenodiscus crispatus*
Leather star	*Dermasterias imbricata*
Sea star	*Dipsacaster eximius*
Crinoid	*Florometra serratissima*
Basket star	*Gorgonocephalus eucnemis*
Sea cucumber	*Havelockia benti*
Blood star	*Henricia leviuscula*
Sea star	*Heterozonias alternatus*
Sea star	*Hippasteria californica*
Sea star	*Hippasteria spinosa*
Sea star	*Hymenodiscus exilis*
Sea star	*Leptasterias hexactis*
Sea star	*Leptasterias pusilla*
Sea star	*Leptychaster anomalus*
Sea star	*Lophaster furcilliger*
Sea urchin	*Lovenia cordiformis*
Sand star	*Luidia foliolata*
Red sea star	*Mediaster aequalis*
Sea star	*Myxoderma sacculatum*
Sea star	*Nearchaster aciculosus*
Sea star	*Odontaster crassus*
Brittle star	*Ophioncus granulosus*
Brittle star	*Ophionereis diabloensis*
Brittle star	*Ophionereis eurybrachiplax*
Brittle star	*Ophiopholis aculeata*
Brittle star	*Ophiopholis bakeri*
Brittle star	*Ophiopholis brachyactis*
Brittle star	*Ophiopholis kennerlyi*
Brittle star	*Ophiopteris papillosa*
Brittle star	*Ophiosphalma jolliense*
Brittle star	*Ophiothrix spiculata*
Rainbow star	*Orthasterias koehleri*
Sea cucumber	*Pannychia moseleyi*
Sea cucumber	*Parastichopus californicus*
Sea cucumber	*Parastichopus johnsoni*

Table G-3. Invertebrates Species List

Common Name	Scientific Name
Sea cucumber	*Parastichopus leukothele*
Bat star	*Patiria miniata*
Sea cucumber	*Pentamera rigida*
Giant sea star	*Pisaster giganteus*
Ochre star	*Pisaster ochraceus*
Spiny star	*Poraniopsis inflatus*
Sea star	*Pseudarchaster dissonus*
Sea star	*Pseudarchaster parelii*
Sea star	*Pseudarchaster pusillus*
Sea cucumber	*Pseudostichopus mollis*
Sea cucumber	*Psolus squamatus*
Sea star	*Pteraster militaris*
Cushion star	*Pteraster tesselatus*
Sunflower star	*Pycnopodia helianthoides*
Sea star	*Rathbunaster californicus*
Sea star	*Sagenaster evermanni*
Sea cucumber	*Scotoplanes globosa*
Sun star	*Solaster*
Sea urchin	*Spatangus californicus*
Brittle star	*Stegophiura ponderosa*
Green sea urchin	*Strongylocentrotus droebachiensis*
Fragile sea urchin	*Strongylocentrotus fragilis*
Red sea urchin	*Strongylocentrotus franciscanus*
Purple sea urchin	*Strongylocentrotus purpuratus*
Sea star	*Stylasterias forreri*
Sea star	*Thrissacanthias penicillatus*
CHORDATA	
Ascidian	*Aplidium californicum*
Ascidian	*Aplidium solidum*
Ascidian	*Ascidia paratropa*
Thaliacean	*Cyclosalpa bakeri*
Lobed tunicate	*Cystodytes lobatus*
Ascidian	*Didemnum carnulentum*
Thaliacean	*Dolioletta gegenbauri*
Ascidian	*Eudistoma ritteri*
Free-swimming tunicate	*Fritillaria borealis*
Free-swimming tunicate	*Fritillaria pellucida*
Ascidian	*Halocynthia igaboja*
Predatory tunicate	*Megalodicopia hians*
Free-swimming tunicate	*Oikopleura dioica*
Free-swimming tunicate	*Oikopleura labradoriensis*
Free-swimming tunicate	*Oikopleura longicauda*
Thaliacean	*Pyrosoma atlanticum*

Table G-3. Invertebrates Species List	
Common Name	**Scientific Name**
Ascidian	*Ritterella aequalisiphonis*
Thaliacean	*Salpa fusiformis*
Thaliacean	*Salpa maxima*
Ascidian	*Styela montereyensis*
Thaliacean	*Thalia democratica*
Thaliacean	*Thetys vagina*
BRACHIOPODA	
Brachiopod	*Laqueus californianus*
Brachiopod	*Platidia hornii*
Brachiopod	*Terebratalia transversa*
Brachiopod	*Terebratulina unguicula*
ECTOPROCTA	
Bryozoan	*Cellaria diffusa*
Bryozoan	*Costazia robertsoniae*
Bryozoan	*Crisia maxima*
Bryozoan	*Flustrellidra corniculata*
Bryozoan	*Integripelta bilabiata*
Bryozoan	*Tricellaria ternata*
CTENOPHORA	
Comb jelly	*Beroe cucumis*
Comb jelly	*Bolinopsis microptera*
Comb jelly	*Pleurobrachia bachei*
Comb jelly	*Thalassocalyce inconstans*

Table G-4. Algae and Plants Species List

CHLOROPHYTA	PHAEOPHYTA, cont.	RHODOPHYTA, cont.
Acrosiphonia coalita	*Nereocystis luetkeana*	*Clathromorphum parcum*
Blidingia minima var. vexata	*Pelvetiopsis limitata*	*Constantinea simplex*
Bryopsis corticulans	*Petalonia fascia*	*Corallina chilensis*
Cladophora columbiana	*Petrospongium rugosum*	*Corallina vancouveriensis*
Cladophora graminea	*Pterygophora californica*	*Corallophila eatonianum*
Codium fragile	*Saccharina sessile*	*Cryptopleura corallinara*
Codium setchellii	*Scytosiphon dotyii*	*Cryptopleura lobulifera*
Derbesia marina	*Scytosiphon lomentaria*	*Cryptopleura ruprechtiana*
Endophyton ramosum	*Silvetia compressa*	*Cryptopleura violacea*
Entocladia viridis	*Spongonema tomentosum*	*Cumagloia andersonii*
Prasiola meridionalis	*Stephanocystis osmundacea*	*Delesseria decipiens*
Ulothrix flacca	**RHODOPHYTA**	*Dilsea californica*
Ulva californica	*Ahnfeltiopsis leptophylla*	*Endocladia muricata*
Ulva clathrata	*Ahnfeltiopsis linearis*	*Erythrophyllum delesserioides*
Ulva compressa	*Anotrichium furcellatum*	*Erythrotrichia carnea*
Ulva conglobata	*Antithamnion dendroidum*	*Farlowia compressa*
Ulva flexuosa	*Audouinella subimmersa*	*Farlowia conferta*
Ulva intestinalis	*Bornetia californica*	*Farlowia mollis*
Ulva lactuca	*Bossiella dichotoma*	*Faucheocolax attenuata*
Ulva lobata	*Bossiella plumosa*	*Gelidium coulteri*
Ulva taeniata	*Bossiella schmittii*	*Gelidium robustum*
Urospora sp.	*Branchioglossum bipinnatifidum*	*Gloiocladia laciniata*
PHAEOPHYTA	*Branchioglossum undulatum*	*Goniotrichopsis sublittoralis*
Alaria marginata	*Calliarthron tuberculosum*	*Gracilariophila oryzoides*
Analipus japonicus	*Callithamnion biseriatum*	*Gracilariopsis andersonii*
Colpomenia peregrina	*Callophyllis crenulata*	*Grateloupia californica*
Compsonema serpens	*Callophyllis flabellulata*	*Grateloupia filicina*
Costaria costata	*Callophyllis heanophylla*	*Griffithsia pacifica*
Desmarestia herbacea	*Callophyllis linearis*	*Gymnogongrus chiton*
Desmarestia ligulata	*Callophyllis obtusifolia*	*Halosaccion glandiforme*
Desmarestia munda	*Callophyllis pinnata*	*Halymenia schizymenioides*
Dictyoneurum californicum	*Callophyllis violacea*	*Herposiphonia parva*
Egregia menziesii	*Centroceras clavulatum*	*Herposiphonia plumula*
Fucus gardneri	*Ceramium gardneri*	*Hildenbrandia occidentalis*
Hinksia sandriana	*Ceramium pacificum*	*Hymenena flabelligera*
Laminaria ephemera	*Chondracanthus canaliculatus*	*Hymenena multiloba*
Laminaria setchellii	*Chondracanthus corymbiferus*	*Janczewskia gardneri*
Laminaria sinclairii	*Chondracanthus exasperatus*	*Leachiella pacifica*
Leathesia difformis	*Chondracanthus harveyanus*	*Lithophyllum dispar*
Melanosiphon intestinalis	*Chondracanthus spinosus*	*Lithothrix aspergillum*

Table G-4. Algae and Plants Species List

RHODOPHYTA, cont.	RHODOPHYTA, cont.	RHODOPHYTA, cont.
Maripelta rotata	*Neorhodomela larix*	*Pterothamnion villosum*
Mastocarpus jardinii	*Nienburgia andersoniana*	*Ptilota filicina*
Mastocarpus papillatus	*Odonthalia floccosa*	*Ptilothamnionopsis lejolisea*
Mazzaella affinis	*Opuntiella californica*	*Pugetia fragilissima*
Mazzaella californica	*Osmundea spectabilis*	*Pyropia gardneri*
Mazzaella flaccida	*Peyssonneliopsis epiphytica*	*Pyropia lanceolata*
Mazzaella leptorhynchos	*Phycodrys setchellii*	*Pyropia nereocystis*
Mazzaella linearis	*Pikea californica*	*Pyropia perforata*
Mazzaella oregona	*Pikea pinnata*	*Rhodochorton purpureum*
Mazzaella parksii	*Pleonosporium vancouverianum*	*Rhodymenia californica*
Mazzaella rosea	*Plocamium pacificum*	*Rhodymenia callophyllidoides*
Mazzaella splendens	*Plocamium violaceum*	*Rhodymenia pacifica*
Mazzaella volans	*Polyneura latissima*	*Rhodymeniocolax botryoides*
Melobesia marginata	*Polysiphonia hendryi*	*Sahlingia subintegra*
Melobesia mediocris	*Polysiphonia pacifica*	*Sarcodiotheca gaudichaudii*
Membranoptera dimorpha	*Prionitis lanceolata*	*Schimmelmannia plumosa*
Mesophyllum lamellatum	*Prionitis linearis*	*Scinaia confusa*
Microcladia borealis	*Prionitis sternbergii*	*Smithora naiadum*
Microcladia coulteri	*Pseudolithophyllum neofarlowii*	*Stenogramma interrupta*
Myriogramme spectabilis	*Pterochondria woodii*	*Stylonema alsidii*
Myriogramme variegata	*Pterocladia caloglossoides*	*Tiffaniella snyderae*
Neogastroclonium subarticulatum	*Pterosiphonia baileyi*	*Weeksia reticulata*
Neoptilota densa	*Pterosiphonia bipinnata*	**TRACHEOPHYTA**
Neoptilota hypnoides	*Pterosiphonia dendroidea*	*Phyllospadix scouleri*

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Appendix H

EIS Distribution List

Appendix H

EIS DISTRIBUTION LIST

The Draft EIS, in either hard copy or CD format, was distributed to the following agencies and persons for review and comment. Wide public notification of the website containing the DEIS and related review and comment information was also made electronically, in the media and in the *Federal Register*.

Congressional Committees

Committee on Natural Resources of the House of Representatives:

- U.S. Congressman Doc Hastings, Chair
- U.S. Congressman Peter DeFazio

Committee on Commerce, Science, and Transportation of the Senate:

- U.S. Senator Jay Rockefeller, Chair
- U.S. Senator John Thune, Ranking Member

Federal Agencies

U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service:

- Irma Lagomarsino, Assistant Regional Administrator, West Coast Region
- Chris Yates, Assistant Regional Administrator for Protected Resources Division

U.S. Department of Defense:

- Chuck Hagel, Secretary of Defense

U.S. Department of Homeland Security
U.S. Coast Guard:

- Rear Admiral Karl L. Schultz, Eleventh District Commander
- LCDR Joe Giammanco, Living Marine Resources Officer

U.S. Department of the Interior:

- Sally Jewell, Secretary

U.S. Department of the Interior
Bureau of Land Management:

- Richard Burns, Field Manager

U.S. Department of the Interior
Bureau of Ocean Energy Management:

- Joan Barminski
  Deputy Regional Director, Pacific OCS Region
  Regulation and Enforcement

U.S. Department of the Interior
U.S. Fish and Wildlife Service:

- Jana Affonso, Deputy Division Chief

U.S. Department of State:

- John Kerry, Secretary of State

U.S. Department of Transportation:

- Ray LaHood, Secretary of Transportation

U.S. Environmental Protection Agency:

- Jared Blumenfield, Administrator for EPA's Pacific Southwest Region

State Governor

- Jerry Brown, Governor, State of California

State Agencies

California Coastal Commission:

- Mark Delaplaine, Manager, Energy, Ocean Resources and Federal Consistency Division

California Natural Resource Agency:

- Catherine Kuhlman, Deputy Secretary for Ocean and Coastal Matters and Executive Director, California Ocean Protection Council

Local Agencies

County of Mendocino Board of Supervisors
County of Sonoma Board of Supervisors

County and City Agencies with Certified Local Coastal Programs

County of Marin:

- Brian Crawford, Director, Community Development Agency

County of Mendocino:

- Andy Gustavson, Chief Planner, Planning and Building Services Department

County of Sonoma:

- Jennifer Barrett, Deputy Director for Planning, Sonoma County Permit and Resource Management Department

City of Point Arena:

- Hunter Alexander, City Administrator/City Clerk, City of Point Arena

City of San Francisco:

- John Raheim, Planning Director, City of San Francisco

Sanctuary Advisory Councils

Cordell Bank National Marine Sanctuary Advisory Council:

- Peter Adams
- Leslie Adler-Ivanbrook
- John Berge
- Rachel Bergren
- George Clyde (on both Cordell Bank and Gulf of the Farallones National Marine Sanctuary Advisory Councils)
- LT Jeannie Crump (on both Cordell Bank and Gulf of the Farallones National Marine Sanctuary Advisory Councils)
- Michael Cummings
- LT Cody Dunagan (on both Cordell Bank and Gulf of the Farallones National Marine Sanctuary Advisory Councils)
- Sarah Hameed
- Jaime Jahncke (on both Cordell Bank and Gulf of the Farallones National Marine Sanctuary Advisory Councils)
- Kevin Krick
- Paul Michel (on both Cordell Bank and Gulf of the Farallones National Marine Sanctuary Advisory Councils)
- Chris Mobley (on both Cordell Bank and Gulf of the Farallones National Marine Sanctuary Advisory Councils)
- Lance Morgan
- Richard Ogg
- Todd Steiner
- Noah Wagner
- Bill Wolpert

Gulf of the Farallones National Marine Sanctuary Advisory Council:

- Bruce Bowser
- Richard Charter
- George Clyde (on both Gulf of the Farallones and Cordell Bank National Marine Sanctuary Advisory Councils)
- Natalie Cosentino-Manning
- Jeannie Crump (on both Gulf of the Farallones and Cordell Bank National Marine Sanctuary Advisory Councils)
- Frank Dean
- Jackie Dragon
- LT Cody Dunagan (on both Gulf of the Farallones and Cordell Bank National Marine Sanctuary Advisory Councils)
- Timothy Duff
- Barbara Emley
- Peter Grenell
- Karen Grimmer
- Jaime Jahncke (on both Gulf of the Farallones and Cordell Bank National Marine Sanctuary Advisory Councils)
- Catherine Kuhlman
- Richard Kuehn
- John Largier
- Gerry McChesney
- Mick Menigoz
- Paul Michel (on both Gulf of the Farallones and Cordell Bank National Marine Sanctuary Advisory Councils)
- Chris Mobley (on both Gulf of the Farallones and Cordell Bank National Marine Sanctuary Advisory Councils)
- Anne Morkill
- Cicely Muldoon
- Mike Murray
- Kellyx Nelson
- Dominique M. Richard
- Patrick Rutten
- Clare Waldmann
- Bob Wilson

Tribes

- Greg Sarris, Chairman, Federated Indians of Graton Rancheria
- Emilio Valencia, Chairman, Kashia Band of Pomo Indians of Stewarts Point Rancheria
- Nelson Pinola, Chairman
  Manchester Band of Pomo Indians

Public Libraries

County of Marin:

- Librarian, Marin County Free Library, Civic Center Library
- Librarian, Marin County Free Library, Point Reyes Library
- Librarian, San Rafael Public Library, Downtown

County of Mendocino:

- Librarian, County of Mendocino Coast Community Library
- Librarian, County of Mendocino, Main Branch Library

County of Sonoma:

- Librarian, Sonoma County Public Library, Santa Rosa Central Library
- Librarian, Sonoma County Public Library, Guerneville Regional Library
- Librarian, Sonoma County Public Library, Sebastopol Regional Library
- Librarian, Sonoma County Public Library, Cloverdale Regional Library
- Librarian, Sonoma County Public Library, Petaluma Regional Library
- Librarian, U.C. Davis Bodega Marine Laboratory Library

County of San Francisco:

- Librarian, San Francisco Public Library, Main Library