

MONTEREY BAY NATIONAL MARINE SANCTUARY

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**Monterey
Bay
National
Marine
Sanctuary**

Final Environmental
Impact Statement/
Management Plan

Volume I



U.S. Department of Commerce

National Oceanic and
Atmospheric Administration

Sanctuaries and
Reserves Division



UNITED STATES DEPARTMENT OF COMMERCE
FINAL ENVIRONMENTAL IMPACT STATEMENT
AND MANAGEMENT PLAN FOR THE PROPOSED
MONTEREY BAY NATIONAL MARINE SANCTUARY

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Prepared By:

Sanctuaries and Reserves Division
Office of Ocean and Coastal
Resource Management
National Ocean Service
National Oceanic and Atmospheric
Administration
1825 Connecticut Avenue, N.W., Suite 714
Washington, D.C. 20235

Title

Final Environmental Impact Statement and Management Plan for the Proposed Monterey Bay National Marine Sanctuary

Abstract

The National Oceanic and Atmospheric Administration proposes to designate Monterey Bay and its adjacent waters, and the submerged lands thereunder, off central California as a National Marine Sanctuary.

The proposed Sanctuary boundaries encompass an area of approximately 2,539 square nautical miles in and surrounding Monterey Bay, off the central coast of California. The proposed Sanctuary boundaries include the coastal and ocean waters over, and the submerged lands under, the entire Monterey Canyon between the northern boundary of Pescadero Marsh and the southern boundary of Julia Pfeiffer Burns Underwater Park and Area of Special Biological Significance (ASBS), 2.5 nautical miles southeast from Partington Point, and extending from the mean high tide line from these sites seaward approximately 18 nautical miles on a southwesterly heading of 240°. These southern and northern boundaries are joined by an arc drawn from Moss Landing, with a radius of 46 nautical miles, over the entire Monterey Canyon complex out to the abyssal plain at 1500 fathoms (approx. 3000 meters). Santa Cruz, Moss Landing and Monterey Harbors are all excluded from the Sanctuary boundaries shoreward from their respective colreg. demarcation lines except for Moss Landing Harbor where all of Elkhorn Slough east of the Highway one bridge is included within the Sanctuary boundaries.

The designation of the Monterey Bay area as a National Marine Sanctuary would provide an integrated program of resource protection, research and education to assist in the long-term management and protection of its resources. Resource protection will involve cooperation with other agencies in formulating resource protection policies and procedures.

Eight regulations are proposed governing: hydrocarbon activities; discharges and deposits (both from within and outside of Sanctuary boundaries); overflights; alteration of or construction on the seabed; historical resources; marine mammals, turtles and seabirds; and "thrill craft". Two other activities are potentially subject to regulations: vessel traffic and fishing. Alternatives to the proposed action include the status quo, larger and smaller boundary options and a non-regulatory option.

Research will include baseline studies, monitoring, and analysis and prediction projects to provide information needed in resolving management issues. Education programs will be directed to improving public awareness of the Sanctuary's resources and the need to use them wisely to ensure their viability.

Lead Agency: U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Ocean Service
Office of Ocean and Coastal Resource Management

Contact: Raphael Lopez, Regional Manager
Sanctuaries and Reserves Division
Office of Ocean and Coastal Resource Management
National Ocean Service/NOAA
1825 Connecticut Avenue, N.W., Suite 714
Washington, D.C. 20235
(202) 606-4126

FINAL ENVIRONMENTAL IMPACT STATEMENT AND MANAGEMENT PLAN
FOR THE PROPOSED MONTEREY BAY NATIONAL MARINE SANCTUARY

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EXEC. SUMMARY

Executive Summary

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PART I: EXECUTIVE SUMMARY

I. Introduction

In accordance with Title III of the Marine Protection, Research, and Sanctuaries Act, as amended, 16 U.S.C. §§ 1431 et seq., this Final Environmental Impact Statement and Management Plan proposes the establishment of a National Marine Sanctuary centered on Monterey Bay to facilitate the long-term management, protection understanding and awareness of its resources and qualities.

This Part of the report (Part I, The Executive Summary) reviews the authority for Sanctuary designation, the goals and status of the National Marine Sanctuary Program, the development of this proposal, the purpose and need for designating a National Marine Sanctuary at Monterey Bay, the socioeconomic consequences of designation and manageability of the area and consultations conducted during the designation process.

Part II describes the entire study area examined for determining a final preferred boundary alternative, including human uses, natural resources, and the existing resource protection regime. The area recommended for the proposed Sanctuary, about 2,539 square nautical miles, provides the habitat and setting for a distinctive assortment of living and non-living marine resources.

Alternatives in developing the proposal to designate a National Marine Sanctuary at Monterey Bay were considered in terms of achieving optimum protection for the ecosystem, improving scientific knowledge of the area, promoting public understanding of the value of Bay area resources, minimizing overlap with existing

jurisdictions and minimizing any negative impacts to the area's income generating activities (Part III). Based on these criteria, Sanctuary designation was preferred to the alternative of no action, and preferred boundary, management, and regulatory alternatives were selected. The environmental consequences of each of these alternatives are described in Part IV.

The plan for managing the proposed Sanctuary is provided in Part V. This plan contains guidelines and goals to ensure that all management actions undertaken in the first five years after designation are directed to resolving important issues as a means of meeting Sanctuary objectives. Management actions are considered in four program categories: (1) resource protection, (2) research, (3) education and, (4) administration.

II. Authority for Designation

Title III of the Marine Protection, Research, and Sanctuaries Act of 1972, as amended, 16 U.S.C. §§ 1431 et seq., (MPRSA) authorizes the Secretary of Commerce to designate discrete areas of the marine environment of special national significance as National Marine Sanctuaries to ensure comprehensive management and protection of their conservation, recreational, ecological, historical, research, educational, or aesthetic resources and qualities. Selection of a site as an Active Candidate for designation as a National Marine Sanctuary formally begins the National Environmental Policy Act (NEPA) environmental impact analysis process. The U.S. Congress directed the National Oceanic

and Atmospheric Administration (NOAA) (P.L. 100-627, section 205) to designate Monterey Bay as a National Marine Sanctuary by December 31, 1989. This directive by Congress automatically advances Monterey Bay to Active Candidate status. NOAA manages the program through the Sanctuaries and Reserves Division (SRD) in the Office of Ocean and Coastal Resource Management.

III. Goals of the National Marine Sanctuary Program

Consistent with the mission of developing a system of National Marine Sanctuaries for the purpose of serving the long-term benefit of the public, the following goals were established for the Program:

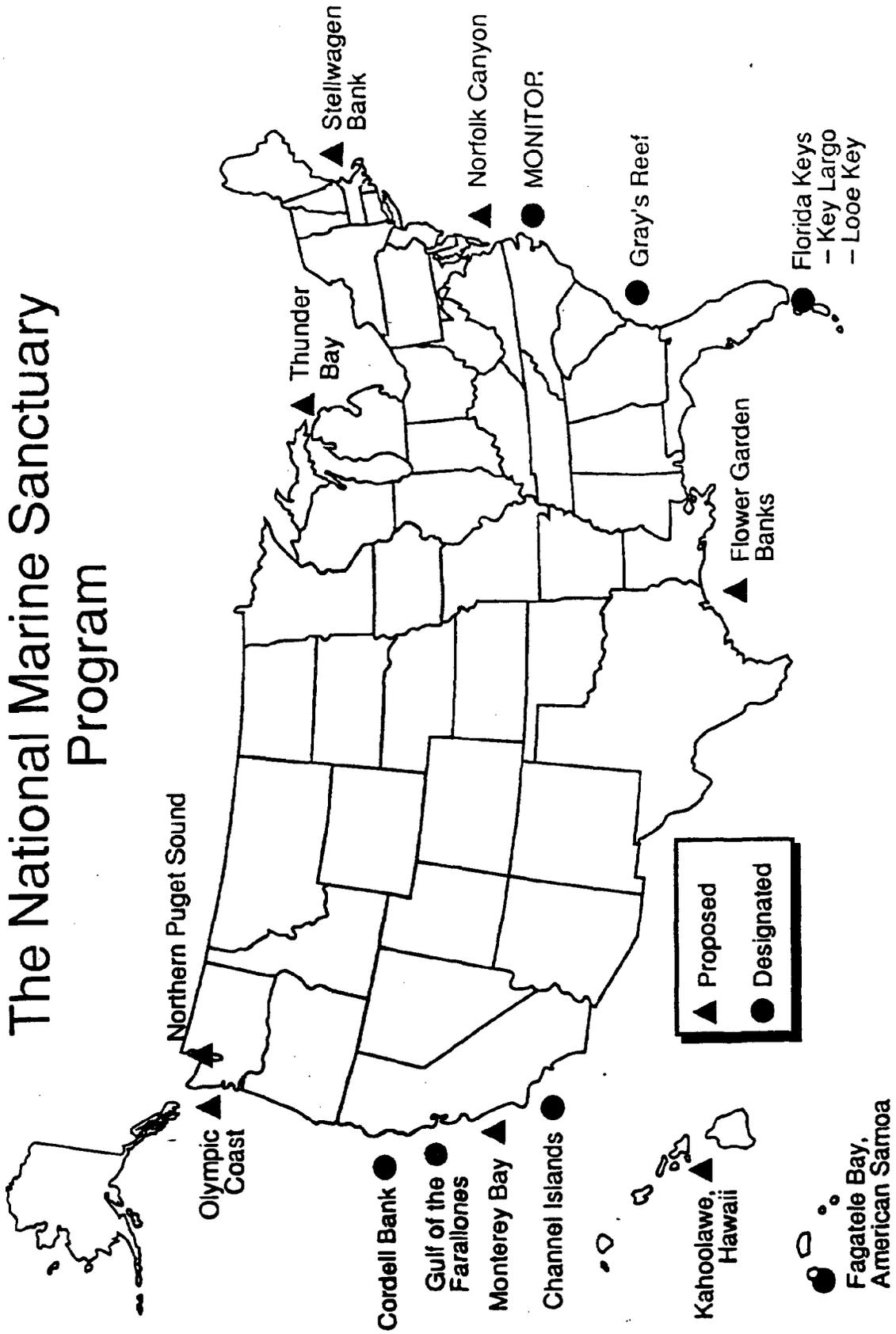
1. Enhance resource protection, through comprehensive and coordinated conservation and management tailored to the specific resources, that complements existing regulatory authorities;
2. Support, promote and coordinate scientific research on, and monitoring of, the site-specific marine resources to improve management decision-making in National Marine Sanctuaries;
3. Enhance public awareness, understanding, and wise use of the marine environment through public interpretive and recreational programs; and
4. Facilitate, to the extent compatible with the primary objective of resource protection, multiple use of these marine areas not prohibited pursuant to other authorities.

IV. Status of the National Marine Sanctuary Program

Nine National Marine Sanctuaries have been established since the Program's inception in 1972 (Figure 1)

The Monitor National Marine Sanctuary serves to protect the wreck of the Civil War ironclad, U.S.S. MONITOR. It was designated in January 1975 and is an area one mile in diameter, 16 miles southeast of Cape Hatteras, North Carolina.

The National Marine Sanctuary Program



- The Key Largo National Marine Sanctuary, designated in December 1975, provides protection and management of a 100 square mile coral reef area south of Miami, Florida.
- The Channel Islands National Marine Sanctuary, designated in September 1980, consists of an area of approximately 1,252 square nautical miles off the coast of California adjacent to the northern Channel Islands and Santa Barbara Island. The sanctuary ensures that valuable habitats for marine mammals, including extensive pinniped assemblages and seabirds, are protected.
- The Looe Key National Marine Sanctuary, designated in January 1981, consists of a submerged section of the Florida reef southwest of Big Pine Key. The site, five square nautical miles in size, includes a beautiful "spur and groove" coral formation supporting a diverse marine community and a wide variety of human uses.
- The Gray's Reef National Marine Sanctuary, designated in January 1981, is a submerged live bottom area located on the South Atlantic continental shelf due east of Sapelo Island, Georgia. The sanctuary, which encompasses about 17 square nautical miles protects a highly productive and unusual habitat for a wide variety of species including corals, tropical fish, and sea turtles.
- The Gulf of the Farallones National Marine Sanctuary, designated in January 1981, is a 948 square nautical mile area off the California coast north of San Francisco. It provides a habitat for a diverse array of marine mammals and birds as well as pelagic fish, plants, and benthic biota.
- The Fagatele Bay National Marine Sanctuary in American Samoa was designated in August 1986. The 163-acre bay contains deepwater coral terrace formations that are unique to the high islands of the tropical Pacific. It serves as habitat for a diverse array of marine flora and fauna included the endangered hawksbill turtle and the threatened green sea turtle.
- The Cordell Bank National Marine Sanctuary, designated in May, 1989, is a 397 square nautical mile area off the central California coast and contiguous with the northern boundary of the Gulf of the Farallones National Marine Sanctuary. Cordell Bank and its surrounding waters, because of a rare combination of oceanic conditions and undersea topography, provide a highly productive marine environment for a rich variety of benthic organisms as well as fish, marine mammals and seabirds in a discrete well defined area.

The Florida Keys National Marine Sanctuary was designated by the U.S. Congress, by the Florida Keys Protection Act (H.R. 5909), October 24, 1990. The Act specifies an 2,600 square nautical mile area of coastal waters off the Florida Keys to be encompassed by the boundaries of the Sanctuary. The purpose of this Act is to protect the Florida coral reef area, one of the most diverse ecosystems in the world, specifically from activities such as vessel groundings and pollution. This Act prohibits oil and gas activities within the Sanctuary and requires the Secretary of Commerce to develop a comprehensive management plan and implementinmg regulations not later than 30 months after the date of enactment of this Act. Upon implementation of this Management Plan Key Largo and Looe Key Sanctuaries would be incorporated into the Florida Keys Sanctuary.

In addition, the Sanctuaries and Reserves Division is in the process of studying, or preparing draft or final designation documents for, eight additional proposed Sanctuaries around the coast of the United States. These proposed Sanctuaries are in North Puget Sound and Olympic Coast, Washington; Santa Monica Bay, California; Stellwagen Bank, Massachusetts; Norfolk Canyon, Virginia; Flower Garden Banks, Texas; Kahoolawe Islands, Hawaii; and Thunder Bay, Michigan (Figure 1).

V. History of the Proposed Monterey Bay National Marine Sanctuary

The State of California nominated the Monterey Bay area in 1977, along with nine other marine areas offshore for consideration as National Marine Sanctuaries. In response to these nominations, NOAA selected three sites for further consideration: Channel Islands, Point Reyes-Farallon Islands, and the Monterey Bay area. In December 1978, NOAA released an Issue Paper on these three sites, presenting several boundary and regulatory options for each proposal. Public hearings on the Issue Paper were held and, based

on the responses, NOAA declared all three sites as Active Candidates on August 10, 1979.

This process led to the designation of the Channel Islands National Marine Sanctuary on September 21, 1980 and the Point Reyes-Farallon Islands National Marine Sanctuary (later renamed the Gulf of the Farallones National Marine Sanctuary) on January 16, 1981. In 1980, NOAA determined that work on the proposed Monterey Bay Sanctuary would be delayed due to the complex analyses and corresponding staff time required for the other two California sites.

On December 14, 1983 NOAA announced in the Federal Register (48 FR 56253) that it had removed Monterey Bay from the list of active candidates for three reasons: (1) the existence of two other National Marine Sanctuaries in California (Channel Islands and Gulf of the Farallones) that protect similar marine resources and the Program's policy, established in 1980, to consider a diverse array of sites and resources; (2) the proposed area's relatively large size and the surveillance and enforcement burdens this would impose on NOAA; and (3) the wealth of existing marine conservation programs already in place in the Sanctuary area.

In 1988, when Congress reauthorized and amended Title III of the MPRSA, it specified in Section 205 of P.L. 100-627 that NOAA designate Monterey Bay as a National Marine Sanctuary by December 31, 1989. This statutory requirement reinstated Monterey Bay as an Active Candidate for Sanctuary status.

NOAA held two scoping meetings in the Monterey Bay area during

January, 1989, to solicit public comments on the proposed Sanctuary. Notice of the scoping meetings was published in the following four newspapers: the Monterey Peninsula Herald, Salinas Californian, Watsonville Register-Pajaronian and Santa Cruz Sentinel. The first meeting was held on January 25, 1989 from 6:30 to 10:00 pm in the Monterey Conference Center, City of Monterey, Monterey County, and the second scoping meeting was held on January 26, 1989 from 6:30 to 10:00 pm in the Chambers of the Santa Cruz County Board of Supervisors, in Santa Cruz City, Santa Cruz County. All interested persons were invited to attend. Those attending the meeting were asked to comment on readily identifiable issues, to suggest additional issues for examination, and to provide information useful in evaluating the site's potential as a Sanctuary. A figure of a study area was presented as an example of the area under consideration for ultimate designation as National Marine Sanctuary (Figure 2). The response was overwhelmingly favorable to proceeding with the evaluation.

Oral and written comment during the scoping period requested that the study area be expanded to include a northern area contiguous with the Gulf of the Farallones National Marine Sanctuary and a southern area to include the California Sea Otter Refuge as designated by the California Department of Fish and Game. In response to the public request for an expanded study area the DEIS/MP included a boundary alternative (#5) that encompassed the area of concern (Figure 3).

NOAA published proposed regulations including a proposed

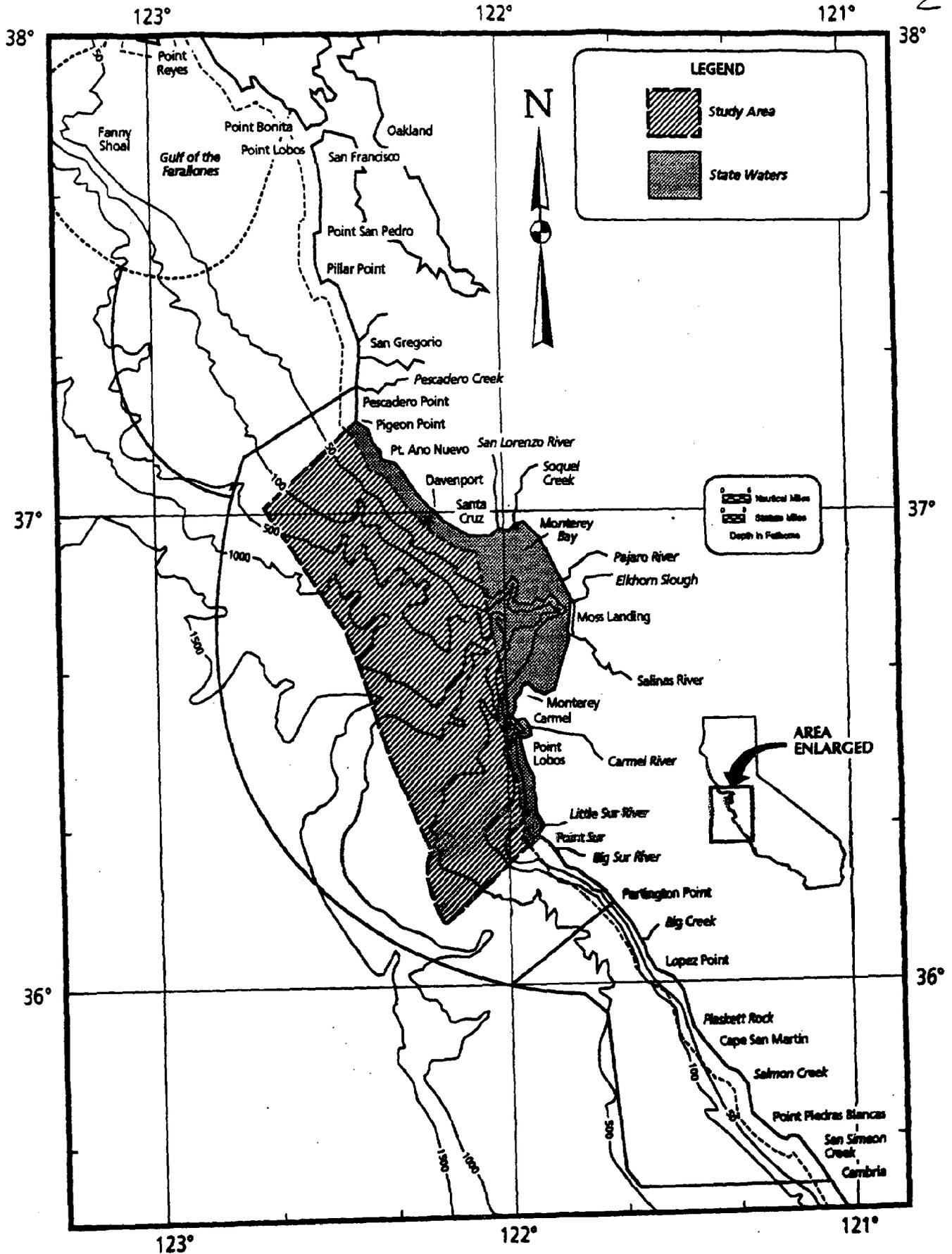
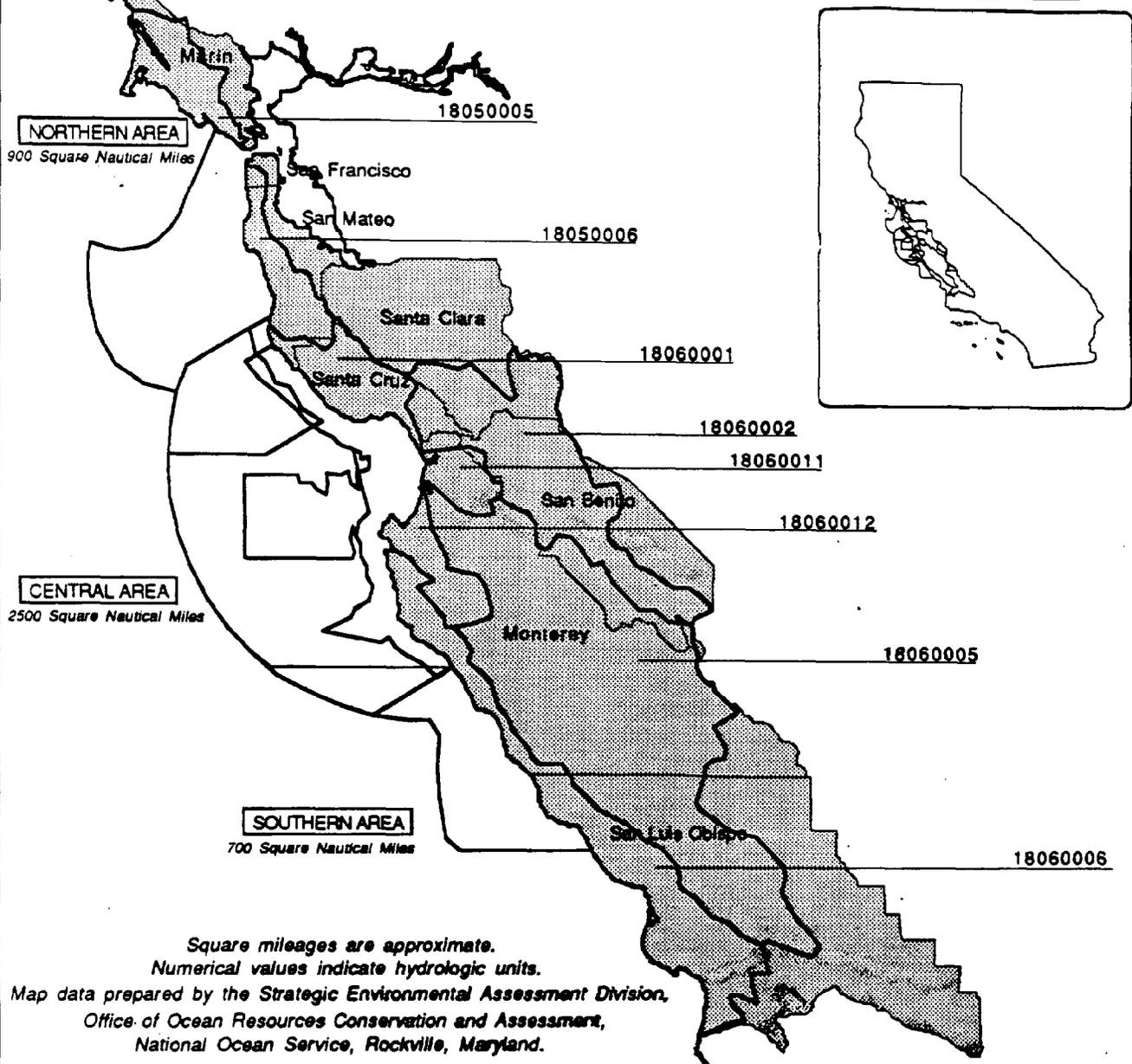


Figure 2. Study Area for Draft EIS/MP.

MONTEREY BAY SANCTUARY BOUNDARIES, ANALYSIS AREAS, ADJACENT COUNTIES, AND HYDROLOGIC UNITS



Square mileages are approximate.
Numerical values indicate hydrologic units.

Map data prepared by the Strategic Environmental Assessment Division,
Office of Ocean Resources Conservation and Assessment,
National Ocean Service, Rockville, Maryland.

BOUNDARY ALTERNATIVES



Alternative 1 Alternative 2 Alternative 3 Alternative 4 Alternative 5 Alternative 6 Alternative 7

Designation Document and an announcement of public hearings (55 FR 31786) and a DEIS/MP for the proposed designation of Monterey Bay as a National Marine Sanctuary on August 3, 1990.

The public hearings were held on September 12, 1990, at Monterey City Hall, Monterey; on September 13, 1990, at Veterans Hall Auditorium, Santa Cruz; and on September 14, at the Community Seniors Center, Half Moon Bay. All interested persons were invited to attend.

Copies of the DEIS/MP were mailed to all those commenting during the Scoping period and were made available for review at: Half Moon Bay City Hall and Half Moon Bay Library, Half Moon Bay, California; Harrison Memorial Library, Carmel; Castroville Branch of the Monterey County Library, Castroville; Aptos Library, Aptos; Santa Cruz City Library, and the California Coastal Commission Offices, Santa Cruz; Association of Monterey Bay Area Governments, Monterey; and the Elkhorn Slough National Estuarine Research Reserve, Watsonville.

The public comment period closed October 3, 1990. A summary of public comments, both oral and written, received during the comment period, and NOAA's response to comments, is provided in Volume II of this FEIS/MP.

VI. Purpose and Need for Designation

A. Natural Resources

The proposed Monterey Bay National Marine Sanctuary meets all of the site identification criteria developed by the Sanctuaries

TABLE XX. ENVIRONMENTAL CONSEQUENCES OF BOUNDARY ALTERNATIVES

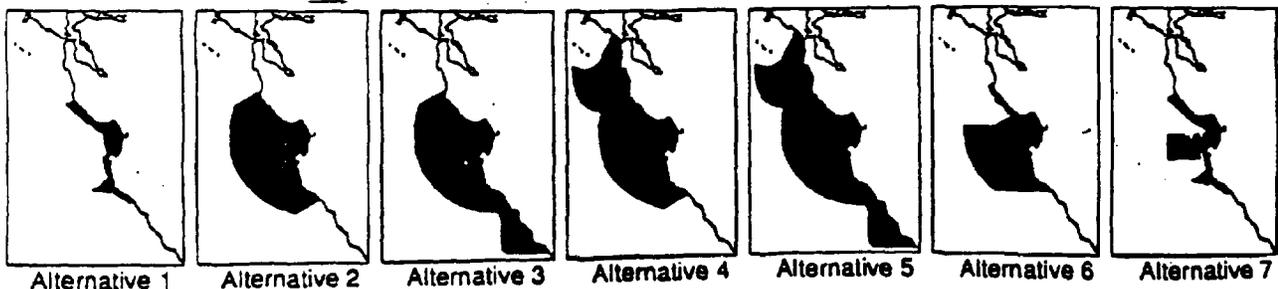
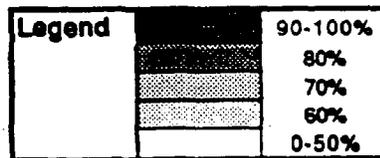
21
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(A) PERCENT RESOURCES ENCOMPASSED

RESOURCE CATEGORY % Distribution	BOUNDARY ALTERNATIVES							UNIT
	1	2	3	4	5	6	7	
Protected Areas	80	80	80	90-100%	80%	80	80	All Sites
Invertebrates	70	70	80	90-100%	80%	70	70	High Conc'n Areas
Rockfish	10	50	70	70	80%	50	20	Spawning Habitat
Squid	40	40	50	90-100%	80%	30	40	Spawning Habiat
Seabirds	20	40	60	80	80%	30	20	High Conc'n Areas
Fissipeds	60	60	90-100%	60	80%	60	60	# of Individuals
Pinnipeds	20	40	80	50	80%	40	20	High Conc'n Areas
Cetaceans	20	60	80	70	80%	50	30	High Conc'n Areas
Canyon Habitat	10	80	90-100%	90-100%	80%	60	40	Sq. nautical miles
Kelp Habitat	50	50	90-100%	50	80%	50	50	Sq. nautical miles
Wetland Habitat	90-100%	90-100%	90-100%	90-100%	80%	90-100%	90-100%	Sq. nautical miles
Historical	40	40	40	90-100%	80%	40	40	Shipwrecks

(B) PERCENT USES ENCOMPASSED

USE CATEGORY % Distribution	BOUNDARY ALTERNATIVES							UNIT
	1	2	3	4	5	6	7	
Comm. Fishing	70	70	70	90-100%	80%	70	70	Total Fish Value
Military	0	60	60	90-100%	80%	60	10	Sqmi. Train'g Areas
Vessel Traffic	30	40	40	90-100%	80%	40	40	# Vessels/ Year
Recreation	70	70	80	90-100%	80%	70	70	#Adj. Ocean Areas
Urban Land Use	90-100%	90-100%	90-100%	90-100%	80%	90-100%	90-100%	Square Miles
OCS Oil	20	30	30	90-100%	80%	20	20	Million Barrels
OCS Gas	20	30	30	90-100%	80%	0	20	Billion Cubic Feet
Discharges (PS)	50	50	50	90-100%	80%	50	50	BGY Wwater in Ocean
Discharges (NPS)	70	70	80	90-100%	80%	70	70	BGY Wwater
Resh/Edn	80	80	80	90-100%	80%	80	80	# of Facilities



and Reserves Division (NOAA, 1983). Located within a broad transition zone between the Oregonian province to the north and the Californian province to the south, the Bay is influenced by relatively cool and fresh waters of the California Current, a classic eastern boundary current that is part of the large-scale North Pacific Gyre. The bathymetry, currents and ocean thermal structure in the area around Monterey Bay provide favorable conditions for strong upwelling of nutrient-rich water, which is often found in the Bay.

Consequently, the nearshore waters and diversity of habitats are highly productive and support exceptionally rich and abundant floral and faunal communities that are very important in central and northern California. The variety of habitat assemblages is one of the major determinants of the rich intertidal and subtidal communities and represents the range of habitats to be found in the Oregonian province. The high density of habitat types and community assemblages provides an excellent environment for a wide variety of research projects and educational opportunities.

While there are submarine canyons elsewhere in the Oregonian province, the Monterey Submarine Canyon is unique in its size, configuration, and proximity to shore. This canyon system provides habitat for pelagic communities and, along with other distinct bathymetric features, may modify currents and act to enrich local water through strong seasonal upwelling. The proximity of the Canyon to the shore also provides a unique opportunity to the scientific community for deep-sea research.

Monterey Bay itself is a rare geologic feature, as it is one of the few large bays along the Pacific coast. Its exposure to the open ocean and upwelling sources, combined with the Bay's current patterns and geometry, greatly enhance biological productivity. This lends additional importance to the area as a resting and staging area for migrating birds, and a habitat for an abundant and highly diverse community of marine organisms.

The area also supports one of the greatest diversities of marine mammals in the world. Among these are several endangered species, including the California gray whale (Eschrichtius robustus), finback whale (Balaenoptera physalus), humpback whale (Megaptera novaeangliae), sperm whale (Physeter catodon), and the threatened California sea otter (Enhydra lutris).

All species of pinnipeds commonly found off the central and northern California coast are found in the Monterey Bay area. Año Nuevo State Reserve and has been cited as the most important pinniped rookery and resting area in central and northern California.

The proposed Sanctuary area also encompasses approximately one-third of the entire Southern sea otter range in California. However, the majority of otters (females and pups) are found south of the Monterey Peninsula. The official northern limit to their distribution is at Pigeon Point.

Monterey Bay plays a major role for avifauna as a staging habitat during migrations, and as wintering and summer habitat. Bird species diversity is very high. Birds are attracted to the

area due to the nutrient rich waters and resulting food resources, the protected bay environment, and location along the Pacific flyway. Breeding populations are generally small and scattered. The entire world population of the Ashy Storm-Petrel (Oceanodroma homochroa) (5000-10,000) can be found feeding in the area immediately above the Monterey canyon from August to November.

The quality and abundance of natural resources has attracted people from the earliest prehistoric times to the present and as a result the area contains significant archeological and paleontological resources. Numerous shipwrecks are located along the central coast of California with significant, valuable historical artifacts.

The wide variety and abundance of these natural resources are of outstanding value to the local, state, regional, national and international community. While Monterey Bay has thus far enjoyed the reputation as an internationally renowned scenic area with good water quality, such success can not realistically be expected in the future without deliberate protection.

B. Present and Potential Uses

The diverse resources of the Monterey Bay area are enjoyed by the residents of this area as well as the numerous visitors. The population of Monterey and Santa Cruz counties was 544,000 in 1985 and is projected to increase to 755,000 by 2005. The projected growth is based in large part on the attractiveness of the area's natural beauty.

The area also supports several economic activities. The most important activity directly dependent on the resources is commercial fishing, which played an important role in the history of Monterey Bay and continues to be a very important activity vital to the region's economy.

Related to fisheries are several aquaculture operations within the Monterey Bay area, which are dependent in large part on a clean source of ocean waters. Some operations collect organisms directly from the Bay while others grow and produce their own stocks through captive breeding.

A unique feature of the Monterey Bay area is the combination of biological and physical characteristics in the area that provide outstanding opportunities for scientific research on many aspects of marine ecosystems. The diverse habitats are readily accessible to researchers. Thirteen research facilities are found in the entire study area. These institutions have a long history of research and large databases possessing a considerable amount of baseline information on the Bay area and its resources. The Sanctuaries and Reserves Division is already responsible for the management of the Elkhorn Slough National Estuarine Research Reserve in cooperation with the State of California, Department of Fish and Game. The proposed Monterey Bay Sanctuary designation would provide a unique opportunity for the establishment of coordinated coastal zone management and research effort through the integration of the facilities and resources and programs of the Reserve and the Sanctuary. This type of program, emphasizing land-

sea interactions, could then serve as an innovative model for other coastal areas of the United States where local land issues and coastal zone problems have traditionally been separated from offshore, marine issues in terms of jurisdiction and research effort.

In addition to tourism and recreational increases, business, commercial and industrial uses of the area are also increasing.

Oil and gas exploration, development and production in the central California Planning area of the OCS may be considered in the future. ~~Development in the northern Bay area was considered with proposed Lease Sale #119, although this Lease Sale has now been cancelled. STRIKEOUT OR NOT?~~

The Bay area also is a place for dredge and waste disposal. Two sites off Moss Landing are used for discharging dredge spoils. Point source pollution from municipal and industrial wastes is dumped into the waters at various outfalls and municipal plans for additional outfalls and discharges into Monterey bay are being considered. Non-point agricultural runoff also enters the Bay primarily from the major agricultural areas of the Salinas and Pajaro Valleys.

Making a more indirect use of the area are the commercial ships that regularly traverse the outer reaches of the area as part of the route from San Francisco to Los Angeles, with infrequent vessel traffic to Moss Landing, Santa Cruz, Princeton or Monterey. Although this traffic is not yet a major concern, contingency plans designed to react to oil spills resulting from tanker accidents are

being formulated and can be coordinated with Sanctuary designation.

So far the variety of human uses has not dramatically altered or damaged the resources of Monterey Bay. However, many people are concerned about the potential conflicts and cumulative effects as the area becomes more heavily populated and visited by increasing numbers of tourists.

C. Adequacy of Existing Authorities to Manage the Area

Existing programs to protect significant resources within the Monterey Bay area and to provide recreational and interpretive opportunities have placed considerable emphasis on the protection of coastal resources but have not given the same attention to marine resources. State programs such as Areas of Special Biological Significance, provide geographically discrete protection for sensitive habitats and species along much of the mainland coast. In reality, of course, marine mammals, seabirds, and other marine flora and fauna depend on habitats and foraging areas far more extensive than those covered by existing protective regulations.

Such critical marine areas as the waters around Año Nuevo Island and over the Monterey Submarine Canyon receive no special attention by resource managers. The waters of the Big Sur and San Mateo coastline receive limited protection but lack a mechanism to establish research priorities and coordination and develop Emergency Response plans for potential accidents such as groundings and/or oil spills. With current resources of existing programs

being limited, the coordination of resource protection and management programs is essential. The Monterey Bay Sanctuary could provide an important role in such coordination.

Maintaining the status quo and not designating a Marine Sanctuary in and around Monterey Bay will preserve the existing level of management and protection and forego the opportunity for positive management of this rich marine area. In the absence of a Sanctuary, there will be less ecosystem research, no new education or public awareness programs directed at users, and no institutional mechanism for long-term planning and coordination of agency activities in this particularly valuable geographic area.

Currently, no institution addresses the range of significant questions concerning the interaction of resources and uses in the area. While a variety of organizations conduct research, there is no systematic coordination to ensure that information needs are addressed in a timely and adequate manner. Even if information becomes available through research projects, no institution is charged with applying that information to practical management issues, such as modification of regulations. Similarly, no agency attempts to monitor the health, stability and changing conditions of this valuable marine ecosystem. Resource assessment through gathering baseline data and continued monitoring of environmental conditions is essential in order to assess the adequacy of the protection afforded these important resources. The status quo alternative would leave the protection of this area to the chance coordination of the regulatory efforts of a number of agencies and

Table . ENVIRONMENTAL CONSEQUENCES OF REGULATIONS BY SANCTUARY BOUNDARY

21

(A) Predicted Cumulative Impact to Selected Resources Under Status Quo

Resource Category	Boundary Alternatives							UNIT
	1	2	3	4	5	6	7	
Protected Areas	○	○	○	□	□	○	○	All Sites
Invertebrates	□	□	□	▨	▨	□	□	High Conc'n Areas
Rockfish		□	□	□	□	□		Spawning Habitat
Squid		□	□	□	□		□	Spawning Habitat
Seabirds		□	□	▨	▨			High Conc'n Areas
Fissipeds	□	□	○	□	□	□	□	# of Individuals
Pinnipeds		□	□	□	□			High Conc'n Areas
Cetaceans		□	□	□	□			High Conc'n Areas
Canyon Habitat								Sq. Nautical Miles
Kelp Habitat	□	□	□	□	□	□	□	Sq. Nautical Miles
Wetland Habitat	□	□	□	▨	▨	□	□	Sq. Nautical Miles
Historical	○	○	○	○	○	○	○	# of Shipwrecks

(B) Predicted Cumulative Impact to Selected Users Under Status Quo

Use Category	Boundary Alternatives							UNIT
	1	2	3	4	5	6	7	
Comm. Fishing	□	□	□	▨	▨	□	□	Total Fish Value
Military	□	□	□	□	□	□	□	Sq. N. Mi. Training Area
Vessel Traffic	○	○	○	◐	◐	○	○	Vessels/Year
Recreation	○	○	○	○	○	○	○	# Ocean Adjacent Areas
Urban Land Use	○	○	○	◐	◐	○	○	Square Miles
OCS Oil	○	◐	◐	●	●	○	○	Million Barrels
OCS Gas	○	◐	◐	●	●	○	○	Billion Cubic Feet
Discharge (PS)	◐	◐	◐	●	●	◐	◐	BGY Wastewater to Ocean
Discharge (NPS)	○	○	○	◐	◐	○	○	BGY Wastewater
Research/Educ'n	○	○	○	○	○	○	○	# of Facilities

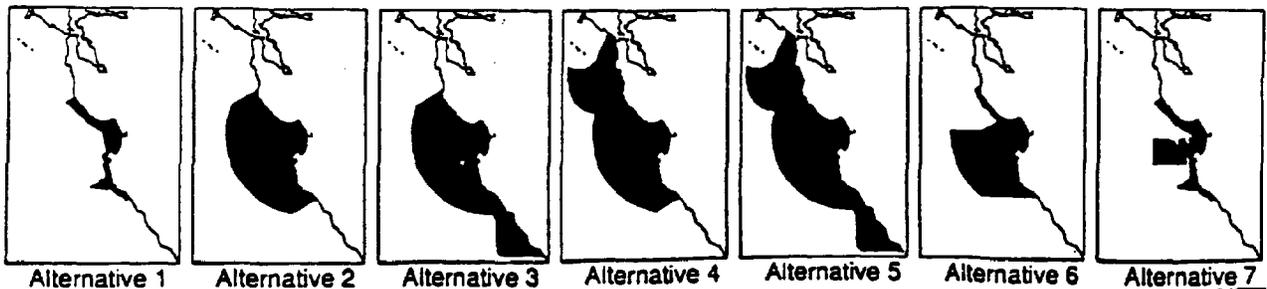
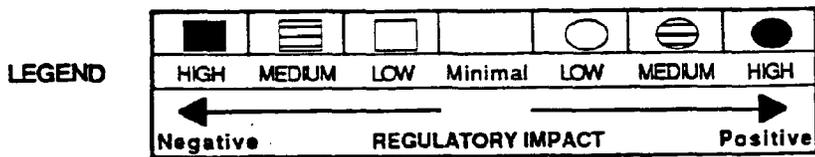


Table . Continued.

(C) Predicted Cumulative Impact to Selected Resources from Sanctuary Regulations

RESOURCE CATEGORY	BOUNDARY ALTERNATIVES							UNIT
	1	2	3	4	5	6	7	
Protected Areas	○	◐	◑	◒	◓	○	○	All Sites
Invertebrates	○	○	○	○	○	○	○	High Conc'n Areas
Rockfish		○	○	○	○	○		Spawning Habitat
Squid	○	○	○	○	○	○	○	Spawning Habitat
Seabirds		◐	◑	●	◓			High Conc'n Areas
Fissipeds	○	◐	●	◓	●	○	○	# of Individuals
Pinnipeds		◐	◑	◒	◓			High Conc'n Areas
Cetaceans		◐	◑	◒	◓			High Conc'n Areas
Canyon Habitat		○	○	○	○	○	○	Sq. Nautical Miles
Kelp Habitat	○	○	◐	○	◓	○	○	Sq. Nautical Miles
Wetland Habitat	●	●	●	●	●	●	●	Sq. Nautical Miles
Historical	◐	◑	◒	●	●	◓	◔	# of Shipwrecks

(D) Predicted Cumulative Impact to Selected Users from Sanctuary Regulations

Use Category	Boundary Alternatives							UNIT
	1	2	3	4	5	6	7	
Comm. Fishing	○	○	○	○	○	○	○	Total Fish Value
Military		□	□	□	□	□	□	Sq. N. Mi. Training Area
Vessel Traffic		□	□	▨	▨	□	□	Vessels/Year
Recreation	◐	◑	◒	◓	◔	◕	◖	# Ocean Adjacent Areas
Urban Land Use	□	□	□	□	□	□	□	Square Miles
OCS Oil	□	□	□	■	■	□	□	Million Barrels
OCS Gas	□	□	□	■	■	□	□	Billion Cubic Feet
Discharges (PS)	▨	▨	▨	■	■	▨	▨	BGY Wastewater to Ocean
Discharges (NPS)	□	□	□	▨	▨	□	□	BGY Wastewater
Research/Educ'n	◐	◑	◒	◓	◔	◕	◖	# of Facilities

Abbreviations Conc'n = Concentration, Sq. =Square, Sq.N.Mi. = Square Nautical Miles, PS= Point Source, NPS = Non-Point Source, Educ'n = Education, BGY = Billion Gallons Year.

would forego opportunities for affirmative management.

Presently, numerous government agencies are vested with some regulatory authority over certain activities within the area (See Appendix C). The regulatory activities are not performed in the context of a comprehensive management plan, and no organizational structure exists to coordinate research and regulation. For example, other than the California Mussel Watch Program, there is no systematic environmental monitoring program nor is there a mechanism for applying research findings to the resolution of management issues. In addition, a major gap exists between the collection of data required under current NPDES permits and the use and application of these data to water quality issues.

These existing authorities provide a considerable degree of protection for marine resources in general and the collection of State Parks, Beaches, Reserves and Refuges do so in particular. In general, however, the statutes described above and the agencies administering them are each directed at a single purpose, region or activity. No entity looks to the welfare of all the living and non-living resources or the ecosystem of this entire marine area. Cumulative impacts on the resources, arising from various activities subject to the jurisdiction of separate agencies, may escape the attention of any single agency.

Although certain uses of the area do not now seriously threaten area resources or qualities, they could have more significant impact if and when activity intensities increase. The various agencies, many of which have different objectives and

jurisdictions, may not be able to respond to future activities on the basis of ecosystem issues. There is no existing mechanism to foster long-term planning, which could mitigate or eliminate harmful activities. Because these waters contain so many valuable resources, which in turn support so many beneficial uses, they require the special acknowledgment and study possible in a Marine Sanctuary to ensure that their particular resources and qualities are protected and managed.

D. Benefits Derived From Sanctuary Status

The preferred alternative would permit the implementation of a coordinated and comprehensive management scheme resulting in the most cost-effective protection of Monterey Bay area resources (Table XX). This alternative would promote resource protection in four ways: (1) It would bolster the existing regulatory resource protection regime. (2) It would establish a coordinated research program to expand knowledge of the Monterey Bay area environment and resources and thus provide the basis for sound management. (3) It would include a broad-based education\interpretive program to improve public understanding of the Monterey Bay area's importance as the habitat for a unique community of marine organisms. (4) It would provide a comprehensive management framework to protect this habitat.

This unique, biologically diverse and relatively undeveloped natural setting is extraordinary, considering its proximity to the Monterey and San Francisco metropolitan regions. Besides providing

an ecologically diverse haven for so many significant concentrations of living resources, the waters also support a number of socially beneficial human activities. These range from fishing to commercial shipping, nature observation, education, scientific research, national defense and law enforcement, and recreation. To date, such activities have been pursued at low intensity levels. However, these and other potential human activities, e.g., oil and gas development, are clearly capable of generating conflicts which could harm the resources of this marine area. Of particular concern are potential damage to species and habitat degradation or destruction which could irreparably damage resource quality over the long term.

The proposed boundaries will integrate many important nearshore and oceanic marine resource zones into one management regime. These zones include: the entire Monterey Canyon complex, the adjacent continental shelf, the Bay itself and certain highly productive shoreline and intertidal areas, such as the marine communities within Pescadero Marsh, Año Nuevo, Elkhorn Sough, Carmel Bay, the Big Sur Platform and coastline, Julia Pfeiffer Burns State Park, and the California Sea Otter Refuge.

Also, five Areas of Special Biological Significance (ASBS) established by the State of California would be included in this alternative. One of the United States' largest marine bird rookeries is incorporated, as well as lesser (but in some cases, recolonizing) pinniped breeding populations. Many species of migratory waterfowl visit seasonally by virtue of the area's

position on the Pacific Flyway. Also, gray whales regularly pass through these waters on their southward and northward migrations. In addition, the Sanctuary boundaries include the ocean waters north and west of the Monterey Bay, which are rich foraging and fishing areas. In addition to unifying the rich habitat areas listed above in one management and planning unit, the proposed Sanctuary, through regulations, would create a buffer area between potentially harmful activities outside the proposed Sanctuary and especially sensitive habitat areas. In short, the marine ecosystem's diverse resources endowment and rich productivity make it an area of regional and National significance. The area deserves long-term protection and enhancement to complement the protection already provided for some of its resources onshore and for sections of the extreme nearshore zone.

Marine Sanctuary designation would allow NOAA to: (1) support research on and monitoring of the resources, (2) enhance public awareness of the value of this area, (3) aid in coordinating actions by existing authorities, (4) formulate long-range plans and respond to currently unforeseen threats which might arise, and (5) regulate activities which either pose a current risk of causing significant damage or may have greater impacts as use of the area increases. Formal acknowledgment of the species and habitat value of these waters should in itself focus additional attention on the resources of this area and thus encourage direct special attention to any future development plans.

The proposed designation will improve resource protection by

instituting new regulatory measures and by supplementing present surveillance and enforcement actions. The overall effect of these regulations, narrowly focused on specific activities, will be beneficial. NOAA when promulgating these regulations must work within the constraints of Title III of the MPRSA. Specifically, section 304(c) provides that NOAA cannot terminate valid leases, permits, licenses or rights of subsistence use or of access existing as of the date of Sanctuary designation but can regulate the exercise of such authorizations and rights consistent with the purposes for which the Sanctuary was designated.

Section 304(a)(4), 16 U.S.C. § 1434(a)(4), of the MPRSA provides that as a condition of establishing a National Marine Sanctuary, the Secretary of Commerce must set forth the terms of the designation. The terms must include: (a) the geographic area included within the Sanctuary; (b) the characteristics of the area that give it conservation, recreational, ecological, historical, research, educational or aesthetic value; and (c) the types of activities that will be subject to regulation in order to protect those characteristics. The terms of the designation may be modified only by the same procedures through which the original designation was made.

The following eight regulations are proposed governing: hydrocarbon activities; discharges and deposits (both from within and outside of Sanctuary boundaries); overflights; alteration of or construction on the seabed; historical resources; marine mammals, turtles and seabirds; and "thrill craft". Two other activities are

potentially subject to regulations: vessel traffic and fishing. **Table X** summarizes the consequences of the Sanctuary regulatory and those of the Status Quo in comparative form.

These activities are subject to regulation, including prohibition, to the extent necessary and reasonable to ensure the protection and management of the conservation, ecological, recreational, research, educational, historical and esthetic resources and qualities of the area. The overall effect of these regulations, narrowly focused on specific activities, will be beneficial.

VII. Socioeconomic Effects of Designation

The regulations proposed for the sanctuary are not likely to result in:

- (1) an annual effect on the economy of \$100 million or more;
- (2) a major increase in costs or prices for consumers, individual industries, Federal, state or local government agencies or geographic regions; or,
- (3) significant adverse effects on competition, employment, investment, productivity, innovation or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The net environmental and socioeconomic effects of designating the Sanctuary and implementing the Sanctuary Management Plan and regulations are estimated to be positive. While such effects are difficult to quantify, the purpose of the Sanctuary in part will be

to maintain or improve water quality, fisheries, aesthetics and tourism without causing any adverse effects.

The proposed Sanctuary regulations would allow all activities to be conducted in the proposed Sanctuary other than a relatively narrow range of prohibited activities. The procedures proposed in these regulations for applying for National Marine Sanctuary permits to conduct otherwise prohibited activities, for requesting certifications for existing leases, licenses, permits, approvals, other authorizations or rights authorizing the conduct of a prohibited activity, and for notifying NOAA of applications for leases or other authorizations to conduct a prohibited activity would impose a cost in time and effort on the part of applicants for such permits or certifications and those subject to the notification requirements. However, NOAA will keep such costs to an absolute minimum by working closely with State and Federal regulatory and permitting agencies to avoid any duplication of effort and will set strict guidelines for reviewing applications in as brief a time as possible.

A. Fishing

As there is no Sanctuary regulation regarding fishing, there would be no negative effects on this highly productive industry. The net effect of preserving habitat and water quality by controlling pollutants and disturbance of the seabed should be very positive for maintaining healthy and productive fish stocks.

If threats arise in the future from this activity the Sanctuary would consult with the Pacific Fisheries Management

Council (PFMC) to determine an appropriate course of action to protect Sanctuary resources and qualities. The PFMC would have the first opportunity to draft any regulations affecting fishing activities.

B. Oil and Gas

Estimates of revenue foregone by the proposed prohibition of oil, gas and mineral activities within the Sanctuary boundary is presented in detail under the socioeconomic consequences for this proposed regulation. Balancing the foregone revenue would be preventing adverse socioeconomic effects by the proposed prohibition of and oil, gas and mineral activities. For example, the proposed prohibition may alleviate or remove matters ranging from costs to local communities for developing on-shore facilities to political and legal action resulting from public controversy and apprehension concerning proposed oil and gas activities.

It is not possible to quantify the positive socioeconomic effects of prohibiting OCS oil and gas activities. The recent NAS study (1989) on the Adequacy of Environmental Information For Outer Continental Shelf Oil and Gas Decisions: Florida and California found that "few data have been collected by MMS or anyone else to address the social and economic impacts of OCS activities".

C. Discharge and Deposits

The regulation prohibiting discharges and deposits and alteration of or construction on the seabed may require permit holders for such activities to seek other areas of disposal or apply higher levels of treatment. All measures, terms and

conditions applied to existing activities will be done in consultation with the affected party and the appropriate management agency. The proposed regulations prohibiting discharges within or beyond the boundaries of the Sanctuary, with certain exceptions, complements the existing regulatory system established by EPA, the State Water Resources Control Board and the Regional Water Quality Control Boards.

The regulation does not prohibit existing sewage outfall discharges or the disposal of dredge material within the Sanctuary at existing sites pursuant to permits existing prior to the date of Sanctuary regulations, provided however, that NOAA may regulate the exercise of these permits as necessary to achieve the purposes for which the Sanctuary was designated. In addition, holders of permits, licenses, or other authorizations issued after the effective date of Sanctuary designation allowing the discharge of municipal sewage or the deposit of dredged material will be subject to Sanctuary regulatory prohibitions unless approved by NOAA.

New dredge disposal and designation of new dredge disposal sites would be prohibited within the Sanctuary. No new dredge disposal activities are being considered within the preferred boundary. In addition, new discharge of primary treated sewage effluent would be prohibited. Within the preferred boundary only the Cities of Santa Cruz and Watsonville discharge at primary levels. The City of Santa Cruz is 75% complete with an upgrade to secondary treatment and the City of Watsonville only recently received a 301H waiver permitting primary discharge thus it would

have five years to upgrade to secondary treatment levels.

Proposed desalination activities would not be prohibited with Sanctuary designation but rather subject to NOAA certification and approval of appropriate permits required by other agencies to ensure that the activity does not injure Sanctuary resources and qualities.

This regulation may impose additional costs by requiring the use of more expensive dredge disposal or dumping sites or methods. The regulation could also result in additional costs if were determined that a higher level of treatment or other, more expensive sewage disposal methods were preferable to disposal in the Sanctuary. It is difficult to predict accurately the economic impact of this regulation without analyzing specific proposals. The application of this regulation to dumping and dredge disposal adds further protection of the resources to that afforded by the existing legislation. The requirement of Sanctuary certification or other approval of permits for municipal, power, industrial and desalination outfall and dredge disposal will ensure that these potentially harmful activities receive special consideration from the Sanctuary viewpoint.

D. Thrill Craft

Thrill Craft are prohibited in the Sanctuary except within three designated zones near the Cities of Santa Cruz, Moss Landing and Monterey. The intent of this prohibition is to minimize disturbance and potential injury to nearshore and coastal resources such as sea otters and kelp beds by designating these zones beyond

the 10 fathom contour. At the same time these zones will minimize conflicts with other users of the area such as surfers and swimmers while at the same time provide access to areas traditionally used by thrill craft operators.

E. Overflights

Overflights below 1000' are prohibited within three zones located generally around Elkhorn Slough, north of Santa Cruz and south of Carmel out to three nautical miles. The intent of this prohibition is to protect sensitive Sanctuary resources, such as nesting seabirds and mammals at haul out areas from the disturbance and startle affects of low-flying aircraft. Access to airports by commercial airlines will not be affected and a local seaplane charter will still be able to take off and land from its base at Santa Cruz.

F. Vessel Traffic

There will be no economic effects on vessel traffic as NOAA has considered and deferred considering regulation of vessel traffic, that may include, but not be limited to: (1) routing of all, or certain classes of coast-wise vessel traffic outside of the boundaries of the Sanctuary, (2) prohibiting oil barge traffic within the Sanctuary; (3) restriction of all large vessels inbound to and outbound from Monterey Bay to designated port access route(s); and (4) designation of areas to be avoided or other internationally recognized measures designed to protect the marine environment.

NOAA will consult with USCG as studies continue and data

becomes available and may propose action in the future for public review. In addition, NOAA will maintain close communication with the USCG to evaluate the need for additional regulations regarding vessel safety and/or emergency response plans and equipment.

G. Alteration of or Construction on the Seabed

Dredging activities are not extensive within the preferred alternative's proposed Sanctuary boundaries; nevertheless, unrestricted alteration of, construction on, or drilling of the seabed represents a threat to marine resources. Foremost among these adverse impacts would be increased turbidity levels, disruption or displacement of benthic and intertidal communities, and human intrusions near marine bird and marine mammal concentrations. The suggested regulatory restriction will allow limited and ecologically sound dredging (particularly along the mainland and in harbors) at levels fairly certain not to harm breeding grounds, haul out areas, and foraging areas.

This regulation will enhance resource protection by reducing the presence and operation of large, and often noisy, dredging machinery. Thus, both over the short and long term, human intrusion upon marine wildlife, along with potentially adverse impacts on their food supplies, e.g., benthic and pelagic fish resources, will be minimized. No severe economic impacts upon commercial firms are expected. Dredging exceptions would allow for installation of navigation aids, and the maintenance of harbors and existing mariculture operations. Harbors are specifically excluded from the Sanctuary boundaries and the regulation of projects for

docks and piers in the nearshore area will remain the responsibility of the existing regulatory authorities.

Activities regarding the construction and placement of pipelines would be allowed after approval by NOAA. New sand mining activities in the surf zone and below mean high tide would be prohibited. Recent studies have shown that this activity is causing acceleration of natural erosion of the seabed and the adjacent dune system. The one company that dredges below the surf zone also mines behind the dunes and would thus be able to continue its activities beyond the boundaries of the Sanctuary.

The activities exempted from this regulation will be monitored by the Sanctuary manager, based on information supplied by the COE and the California Coastal Commission. If the data collected demonstrate that a greater degree of Sanctuary oversight is appropriate, amendments to the regulations could be proposed.

VIII. Manageability of the Area

The preferred alternative offers better opportunities for interpretation and communication due to the availability of the proposed satellite facilities and immediate staffing. The full-time attention of the manager would be available for resource protection due to the immediate availability of research and education coordinators.

The management of the proposed Sanctuary would integrate and utilize all aspects of the program to provide for the preservation of the special values of this unique marine area. Research and

education, coordination, long-term planning and necessary regulations are described in the enclosed Management Plan (MP).

The MP describes management goals and objectives of the Sanctuary tailored to the specific resources and uses of the area. The goals and objectives will provide all Sanctuary users with a framework for conserving resources and integrating uses compatible with the goals of the MP. These management goals are open ended and therefore allow for alternative planning strategies. Each objective of the MP represents a short-term measurable step towards achieving the management goals.

The Sanctuary manager will promote coordination among all the authorities concerned with the Sanctuary and will particularly stress consideration of the special value of the Sanctuary's living resources in the formulation of policies affecting the area. The greater understanding of Sanctuary resources and the effects of human use gained as a result of the research and monitoring will enable NOAA to provide valuable assistance to other authorities in their determinations relating to the level of protection for the resources of the Sanctuary.

The management program for the proposed Sanctuary will be developed and implemented by NOAA and the on-site manager in conjunction with other state, Federal and local agencies in order to benefit from existing expertise and personnel and to promote State and Federal interagency coordination and cooperation. These include those of the California Departments of Fish and Game and Parks and Recreation, the Regional Water Quality Control Boards,

Department of Boats and Waterways, local municipalities, AMBAG, National Park Service, Fish and Wildlife Service, the Coast Guard and National Marine Fisheries Service.

A particularly useful mechanism for coordination would be a Sanctuary Advisory Committee, including members from Federal, State and local agencies, as well as commercial and private interests and the public. The SAC could ensure an exchange of information, advise the Sanctuary manager on permit applications and certifications, research priorities, amendments to the regulations, and other matters.

IX. Consultations

A. National Environmental Policy Act (NEPA)

This document is both a Final Environmental Impact Statement (FEIS) and Management Plan (MP) for the proposed Monterey Bay National Marine Sanctuary. The FEIS has been completed in accordance with the Council on Environmental Quality's regulations (40 CFR 1500-1508) for implementing the procedural provisions of the National Environmental Policy Act of 1969, as amended (42 USC 4321-4347), including Public Scoping Meetings (January, 1989) and Public Hearings on the DEIS/MP (September, 1990) in the Monterey Bay area. (The MP is included in accordance with Section 304 of the MPRSA).

B. Endangered Species Act (ESA)

Pursuant to Section 7 of the ESA, the U.S. Fish and Wildlife Service of the Department of the Interior, and the National Marine

Fisheries Service of the Department of Commerce, were consulted in the performance of the biological assessment of possible impacts on threatened or endangered species that might result from the designation of a National Marine Sanctuary at Monterey Bay. The consultation confirmed that some 18 Endangered (E) and three Threatened (T) species are known to occur in the area. The species identified are:

- | | | |
|---------------------------------------|--------------------------------------|---|
| 1. California brown pelican.... | <u>Pelicanus occidentalis calif.</u> | E |
| 2. Short-tailed albatross..... | <u>Diomedea albatrus</u> | E |
| 3. American peregrine falcon..... | <u>Falco peregrinus anatum</u> | E |
| 4. California least tern..... | <u>Sterna antillarum browni</u> | E |
| 5. Gray whale..... | <u>Eschrichtius robustus</u> | E |
| 6. Right whale..... | <u>Eubalaena glacialis</u> | E |
| 7. Blue whale..... | <u>Balaenoptera musculus</u> | E |
| 8. Fin whale..... | <u>B. physalus</u> | E |
| 9. Sei whale..... | <u>B. borealis</u> | E |
| 10. Humpback whale..... | <u>Megaptera novaeangliae</u> | E |
| 11. Sperm whale..... | <u>Physeter catodon</u> | E |
| 12. Green sea turtle..... | <u>Chelonia mydas</u> | E |
| 13. Leatherback sea turtle..... | <u>Dermodochelys coriacea</u> | E |
| 14. Pacific Ridley sea turtle..... | <u>Lepidochelys olivacea</u> | E |
| 15. Loggerhead sea turtle..... | <u>Caretta caretta</u> | T |
| 16. Guadalupe fur seal..... | <u>Arctocephalus townsendi</u> | T |
| 17. Stellar sea lion..... | <u>Eumatopias jubatus*</u> | T |
| 18. Southern sea otter..... | <u>Enhydra lutris nereis</u> | T |
| 19. Santa Cruz long-toed salamander.. | <u>Ambystoma macro. croceum</u> | E |
| 20. San Francisco garter snake... | <u>Thamnophis sirt. tetrataenia</u> | E |
| 21. Smith's blue butterfly..... | <u>Euphilotes enoptes smithi</u> | E |
| 22. Santa Cruz cypress..... | <u>Cupressus abramsiana</u> | E |

* Listed as threatened for an eight month interim period pursuant to an emergency rule published April 5, 1990.

Both the FWS and the NMFS responded that Sanctuary designation was not likely to adversely affect these species and that no formal consultation pursuant to Section 7 was necessary.

C. Resource Assessment

The Marine Protection, Research, and Sanctuaries Act, as

amended, requires a resource assessment report documenting present and potential uses of the proposed Sanctuary area, including uses subject to the primary jurisdiction of the Department of the Interior (DOI). This requirement has been met in consultation with the DOI and the assessment report is contained in Part II.

D. Federal Consistency Determination

Section 307 of the Coastal Zone Management Act of 1972, as amended, requires that each Federal agency conducting or supporting activities directly affecting the coastal zone shall conduct or support those activities in a manner that is, to the maximum extent practicable, consistent with approved state management programs. This requirement has been met through a Federal Consistency Determination made by NOAA to the California Coastal Commission that the designation of Monterey Bay as a National Marine Sanctuary is consistent, to the maximum extent practicable, with California's Coastal Management Plan.

E. Fishery Regulations

Section 303(b)(2)(D) of the Marine Protection, Research, and Sanctuaries Act, as amended, requires consultation with the Pacific Fisheries Management Council (PFMC). During consultation NOAA requested the PFMC to determine if additional fishery regulations were necessary with Sanctuary designation in accordance with Section 304(b)(5). PFMC responded that no additional regulations were necessary and that management responsibility regarding fishing activities should remain with existing authorities.

F. Other Federal and State Agencies and the U.S. Congress

The Secretary has consulted with the Committee on Merchant Marine and Fisheries of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate. On August 3, 1990, the Designation Prospectus for the Monterey Bay National Marine Sanctuary was provided to all members of each committee. The results of these consultations have been incorporated into the Final Environmental Impact Statement and Sanctuary Management Plan (FEIS/MP).

The Secretaries of State, Defense, Transportation, and the Interior, the Administrator of EPA, and the heads of other interested Federal agencies were consulted and their comments were addressed by the FEIS/MP. Copies of all such written comments are provided in Volume II of the FEIS/MP.

Appropriate California State and local government agencies were consulted and their comments were addressed by the FEIS/MP. Copies of all such written comments are provided in Volume II of the FEIS/MP.

The comments of all other interested persons were addressed by the FEIS/MP and copies of all such written comments are provided in Volume II of the FEIS/MP.

SETTING

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PART II: THE SANCTUARY SETTING

I. Section: The Regional Context

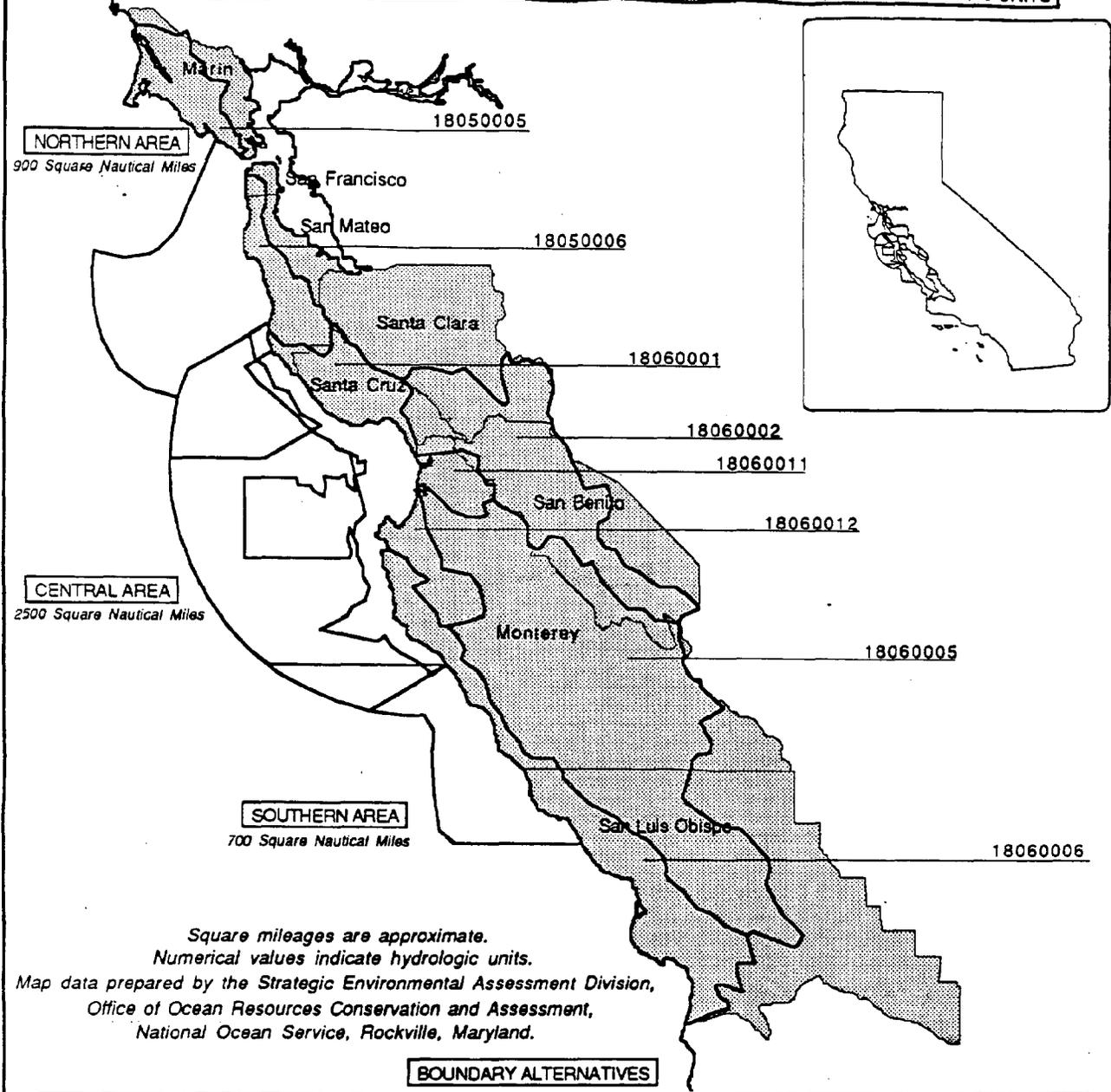
A. Sanctuary Location

Monterey Bay is located along the central California coast about 50 miles (80 km) south of San Francisco (Figure 3). It is California's second largest bay and one of the few major bays along the entire Pacific Coast of the United States. Perhaps its most significant feature is also its least obvious: it possesses the deepest and largest submarine canyon along the west coast of North America.

The bay is an open embayment approximately 20 nautical miles (nmi) (37 km) long, north to south, and up to 9 nmi (16 km) wide in an east-west direction. It is symmetrical in shape with bights in the extreme northern and southern ends. It covers an area of approximately 160 nmi² (550 km²) (Breaker and Broenkow, 1989). Monterey Canyon, equivalent in size to the Grand Canyon, divides the bay into two more-or-less equal northern and southern parts.

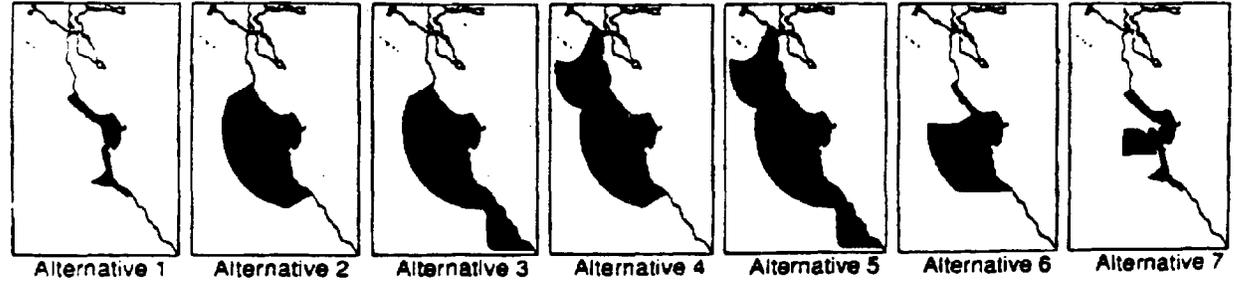
The proposed Sanctuary area includes both Monterey Bay itself and the adjacent coastline to the north and south. Specifically, it includes a Sanctuary area of approximately 2,200 square nautical miles and includes the coastal and ocean waters over, and submerged lands under the entire Monterey Canyon between the northern boundary of Pescadero Marsh, 2.0 nmi north of Pescadero Point, and the southern boundary of Julia Pfeiffer Burns Underwater Park and Area of Special Biological Significance (ASBS), 2.5 nmi south of Partington Point, and extending from these sites seaward

MONTEREY BAY SANCTUARY BOUNDARIES, ANALYSIS AREAS, ADJACENT COUNTIES, AND HYDROLOGIC UNITS



*Square mileages are approximate.
 Numerical values indicate hydrologic units.
 Map data prepared by the Strategic Environmental Assessment Division,
 Office of Ocean Resources Conservation and Assessment,
 National Ocean Service, Rockville, Maryland.*

BOUNDARY ALTERNATIVES



Alternative 1 Alternative 2 Alternative 3 Alternative 4 Alternative 5 Alternative 6 Alternative 7

approximately 18 nmi on a southwesterly heading of 240° and joined by an arc of approximately 46 nmi drawn from Moss Landing over the entire Monterey Canyon complex out to the abyssal plain at 1,500 fathoms (approximately 3,000 m). The land-side boundary extends to the mean-high tide level but Moss Landing, Santa Cruz and Monterey Harbors are all excluded from the Sanctuary boundaries (Figure 3).

The coastline setting varies from sandy beaches and rocky outcrops to sandstone cliffs and sand bluffs north of Santa Cruz, to over 25 miles of wind-swept dunes and beaches that fringe part of the bay, to the rugged rocky coastal areas of Monterey Peninsula and Big Sur. The nutrient-rich waters of the bay support extensive fish, invertebrate, seabird, and marine mammal populations while many commercial fisheries provide a significant economic benefit to the region and the nation.

B. Regional Access

The Monterey Bay area has been a popular seaside resort since the late 1800's. To the north is the San Francisco-Oakland metropolitan area with a population of about five million. Highway Number 1 parallels the coast throughout the area, making coastal access possible in many places. North-east Santa Clara and San Benito counties have rapidly growing urban populations in San Jose, Morgan Hill, Gilroy and Hollister. North of the Monterey Peninsula, the shoreline is very accessible because of the large amount of public ownership. South of the peninsula the rugged nature of the terrain and more private ownership make ocean access difficult, although many miles of the southern coast are owned and

managed by the California Department of Parks and Recreation.

II. Section: Sanctuary Resources

A. Introduction

The unique marine resources of Monterey Bay are attributable to the area's large submarine canyon and a special set of oceanic conditions that combine to produce the bay's highly productive waters. Distinct bathymetry, combined with the area's ocean currents and thermal structure, produce strong seasonal upwelling of nutrient-rich deep water. These highly productive nearshore waters in turn support diverse floral and faunal populations. The extensive kelp beds, and the diversity of rock types, sediment types, and shoreline characteristics combine with the nutrient-rich waters to form several habitat assemblages.

Monterey Bay has the most diverse algal community in North America. The area supports one of the largest diversities of marine mammals in the world, including the endangered California gray whale, finback whale, humpback whale, sperm whale, and California sea otter. Año Nuevo, at the northern end of the proposed Sanctuary area, is the most important pinniped rookery and resting area in central and northern California. The bay area is important as a staging habitat for avifauna along the Pacific Flyway. The waters support extensive and varied fish populations.

B. Environmental Conditions

1. Geological Oceanography

The Monterey Bay region is located on the continental margin within the California Coast Ranges province. It is situated on a

major structural unit of the earth's continental crust called the Salinian Block. About 20 million years ago, this block was displaced northward from the southern Sierra-Nevada Mountain Range on the Pacific tectonic plate by movement along the San Andreas Fault. Faults in the Monterey Bay area lie primarily within two major, essentially northwest-southeast-trending fault zones: the Palo Colorado-San Gregorio and the Monterey Bay fault zones (H. G. Green, pers. comm., 1989). The Monterey Bay Fault Zone is located in Monterey Bay between Monterey and Santa Cruz. It forms a diffuse zone, 10 to 15 km wide, of short en echelon, northwest-trending faults (Green, 1977). The Palo Colorado-San Gregorio fault system is formed by the San Gregorio fault which extends from Point Año Nuevo to Point Sur where it connects with either the Palo Colorado fault (Dohrenwend, 1971; Green, 1977) or the San Simeon fault. Movement in the active San Andreas Fault caused the October 17, 1989 Loma Prieta earthquake; the epicenter of the magnitude 7.1 earthquake is located near Santa Cruz.

The most prominent geological feature of Monterey Bay is the Monterey Submarine Canyon. The main canyon begins in 18 m of water about 100 m offshore from Moss Landing. There are two main branches of the Monterey Canyon: Soquel Canyon to the north and Carmel Canyon to the south. An additional canyon - Ascension Canyon - indents the shelf off of Año Nuevo. The entire canyon extends about 45 nmi (82 km) offshore to the foot of the continental slope at a depth of about 2925 m. At about 1830 m depth, the height of the canyon walls attain proportions similar to

that of the Grand Canyon of the Colorado River (Shepard and Dill, 1966). Today Monterey Canyon is actively being excavated and exhumed. This activity continues to be tectonically controlled as fault rupture brought about by plate motion causes earthquakes that stimulate slumping and turbidity flows within the canyon. Continued movement along strike-slip faults is also displacing a segment of the deeper part of the canyon to the north (Green, in press).

The substrate of the region is variable (Martin and Emery, 1967). The surface sediment types tend to follow the seafloor contours (Figure 4). Nearshore the sediments are sand and fine sand, offshore they are sand and mud. In both areas, the sediments overlie beds of sandstone, siltstone, and conglomerate. From the mid to late Miocene (approximately 15 million years ago) sediments were deposited in the Monterey Bay area that over time created the marine shale that is currently considered to be of primary hydrocarbon potential, specifically in the Año Nuevo and La Honda Basins.

The sediments in the canyon vary from sand nearshore to mud in the deeper areas. Rocky outcrops are found on the walls of the canyon. About 3.2 million cubic yards of sediment are deposited in the bay during the winter and spring months by the San Lorenzo River, Soquel Creek, Aptos Creek, Pajaro River, and the Salinas River (Griggs, 1986).

The Monterey Bay area is characterized by a narrow continental shelf and is surrounded by a variety of coastal types. The San

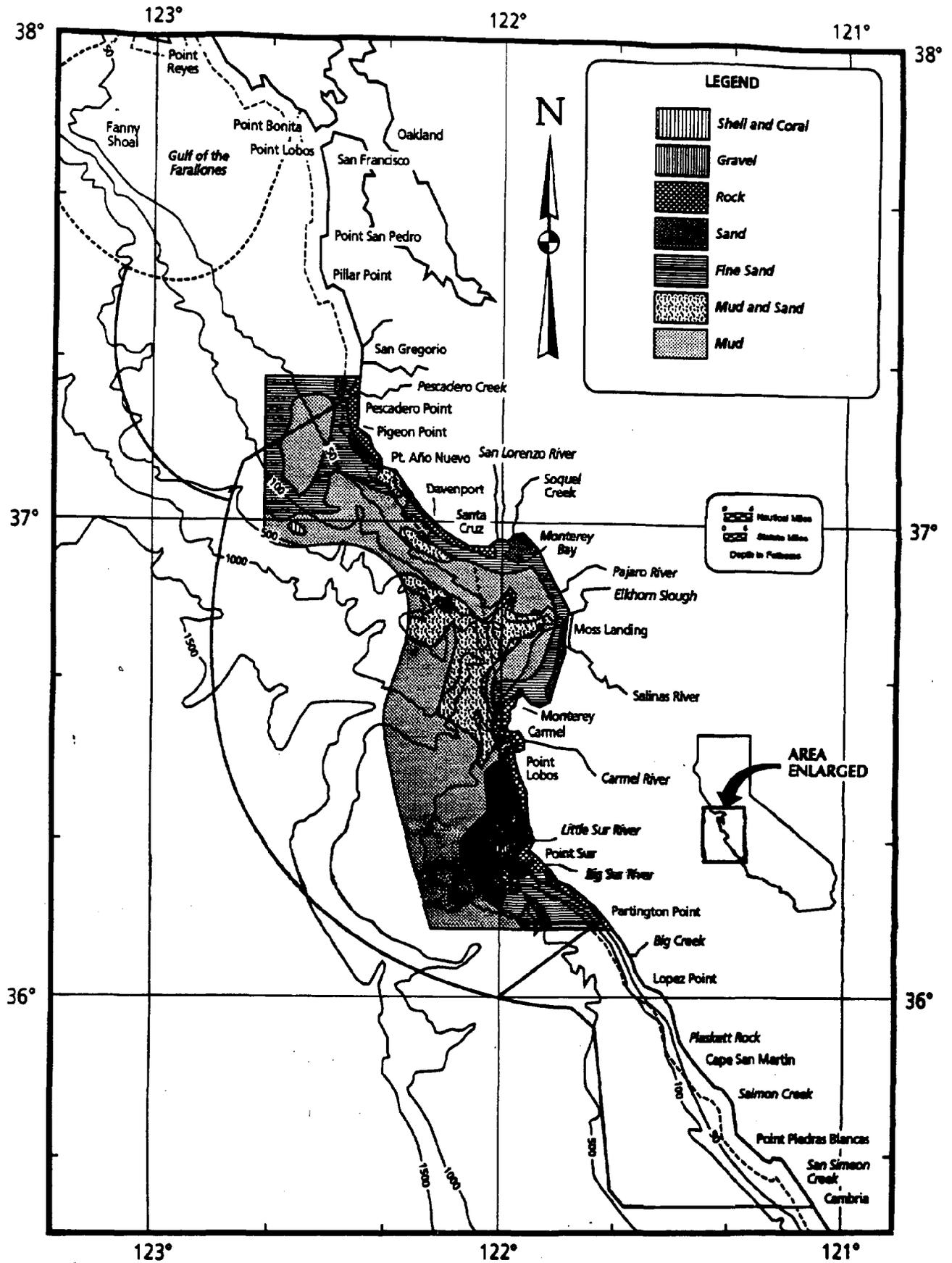


Figure 4. Monterey Bay Area Sediment Types (NOAA, 1982).

Mateo coastline to the north of Monterey Bay consists of long stretches of sandstone cliffs with intermittent breaks created by streams that provide sandy beaches and small estuarine habitats. The cold ocean currents, coastal fog, tectonic upthrust, and sandstone cliffs provide an ideal environment for the creation of intricate caves, caverns and underground labyrinths known as "tafoni". These dramatic and complex erosional features are especially intricate in the Cretaceous sandstone of the Pigeon Point formation on the San Mateo Coast.

The northern coastline of Monterey Bay has sand bluffs and flat-topped terraces of mudstone as well as rocky intertidal areas. From Soquel Point southward almost to Moss Landing, cliffs fronted by sandy beaches predominate. Sedimentary rocks, mostly shales, form the slopes of the Salinas Valley and the flat coastal shelf at the north end of the bay (Gordon, 1977).

The rough, boulder-strewn headlands of Point Pinos at the southern part of the bay are composed of granite. The white dunes and beaches of Pacific Grove are derived from the weathering of these granites. Sandy beaches backed by large dunes extend southward from here to the rocky headland of the Monterey Peninsula. South of the Monterey Peninsula is the Big Sur coastline that is world renowned for its steep cliffs and rocky headlands.

2. Meteorology

The North Pacific High Pressure System dominates the region's large-scale meteorology, and produces northerly winds along the

entire U.S. west coast during most of the year (Beardsley et al., 1987). The high migrates northward and intensifies during early spring, providing the strong upwelling-favorable coastal winds characteristic of March through October (Nelson, 1977). The direction and intensity of coastal winds are also strongly influenced by local coastline orientation and topography (Zemba and Friehe, 1987). Large-scale fluctuations in the wind are caused primarily by atmospheric storm systems that are several hundred miles in diameter, and have time scales longer than about 2 days (Halliwell and Allen, 1987).

In the Monterey Bay area seasons are weakly developed. The area has a moderate maritime climate with the general pattern of wet winters and relatively dry summers. January and February are usually the wettest months, while July and August are virtually without rainfall (Gordon, 1977). The amount of rainfall varies markedly not only year to year but also on both sides of the bay. Monterey averages about 15 inches (38 cm) annually; Santa Cruz averages about 28 inches (69 cm).

During the period of March through October the prevailing winds are from the northwest (Nelson, 1977). Winter winds are variable, often from the west or southwest. Winds are strongest in May (averaging 14 knots) and weakest between November and January (averaging 3 knots) (Breaker and Broenkow, 1989). The cool water of the California Current flows south along the coast during March through October; however, between November and February this current moves offshore off the continental shelf and slope and is

replaced with the warmer, northward flowing waters of the Davidson Current (See below under the Physical Oceanography section for detail on current movements in the area). The net effect of these alternating currents is that the Monterey Bay climate is characterized by both northern temperate and southern sub-tropical features.

Air temperatures along the shoreline can vary significantly depending upon protection from the dominant northwest winds and storms. For example, Año Nuevo has a distinct microclimate making it warmer, and with more sunshine and fog-free days than coastal areas directly to the north or south (Weber, 1981). Both annual and diurnal temperature ranges are small because of the moderating influence of the ocean.

The central California coast is characterized by a recurrent fog during spring and summer. Heavy fog predominates in the morning near the coast with clearing usually occurring with the afternoon's warmer temperature. The fog is caused when the warm moist air associated with the prevailing westerly winds comes in contact with the cold upwelled waters along the coast.

3. Physical Oceanography

a. Waves

The height and period of waves in Monterey Bay and the nearby coastal ocean vary with the seasons and location. Heights are greatest during winter and lowest in summer (Seymour et al., 1990). Under the more stable summer conditions, the waves are able to

build broad, gently-sloping beaches. Winter conditions produce higher waves that transport sand to the offshore zone and erode beaches (Gordon, 1977).

The typical significant wave height at Marina is about 75 cm with a period of around 7 seconds. Severe waves occurred in the mid-1980's that inflicted damage to the Monterey Regional Water Pollution Control Agency (MRWPCA) outfall. The bathymetry of the Bay, particularly with the submarine canyon has the ability to refract longer period waves, causing a diverging, or lessening of wave energy near the head of the submarine canyon. However, this is done at the expense of causing wave energy to converge to the south and north and may have been the cause of the damage to the MRWPCA outfall.

The northern Bay is somewhat protected from the most energetic storms from the northeast. The significant wave height in Santa Cruz Harbor is about 60 cm, which is concentrated as longer period swell. Wave periods outside the Bay are similar to those at Marina. However, waves at locations away from the coast are usually larger. Maximum daily significant wave heights in exposed areas of the Bay are generally 2-4 m. Heights of about 1 m are typical off Half Moon Bay, significant wave heights of 2 m and more occur regularly in the Gulf of the Farallones. Swells of 3-4 m and greater have been measured at offshore locations at all times of the year.

Because it is a semi-enclosed basin the surface of Monterey Bay will also seiche, or fluctuate, at several longer periods (up

to 36 minutes) that are characteristic of its geometry (Schwing et al., 1990b). Seiching generally develops following strong winds, or seismic activity. Given its position relative to several active fault zones, it is not surprising that tsunamis, or seismic sea waves, as large as 1.5 m have been observed in the Bay (Lander and Lockridge, 1989; Schwing et al., 1990b).

b. Water Temperature

Water temperatures in the bay appear to be largely controlled by the oceanographic conditions off the coast. Surface water temperatures average 52°F (11°C) to 54°F (12°C) during late fall and early summer. No distinct thermocline is present during this period. Surface temperatures in the summer reach 59°F (15°C) and higher (Harville, 1971). Infrared satellite images taken during spring and summer, often show cold upwelled water across the entrance of Monterey Bay and that sea-surface temperatures in a narrow nearshore band along the eastern edge of the Bay are much warmer than elsewhere, reflecting the importance of local heating within the Bay (Breaker and Broenkow, 1989). (See below under section on Upwelling and Eddies).

More recent data (Tracy, 1990; Farrel et al., 1990) indicate that warmer, fresher oceanic water moves rapidly into the Bay during periods of weak or southerly spring and summer winds. Thermal gradients, both vertically and horizontally, are greatly reduced in winter.

c. Offshore Ocean Currents

The California Current System (CCS) is a part of the great

clockwise circulation of the North Pacific Ocean (Dodimead et al., 1963). At high latitudes water move eastward under the influence of strong westerly winds. Near the coast of North America the flow divides into two branches. The smaller component turns northward into the Gulf of Alaska; the larger component turns south-eastward to become the California Current.

The California Current transports Subarctic water of relatively low temperature and salinity, and high dissolved oxygen and nutrients toward the tropics (Hickey, 1979). As it moves south, much warmer and saltier Subtropical water, featuring low oxygen and nutrient concentrations, gradually mixes in from the west. Water temperatures at the surface range between 52°F (11°C) and 55°F (13°C).

Equatorial Pacific water, which is warmer and saltier, lower in oxygen and higher in nutrients than surrounding waters, mixes in at subsurface levels as this current flows north. The California Current is also diluted by precipitation and coastal runoff, primarily from the Columbia River.

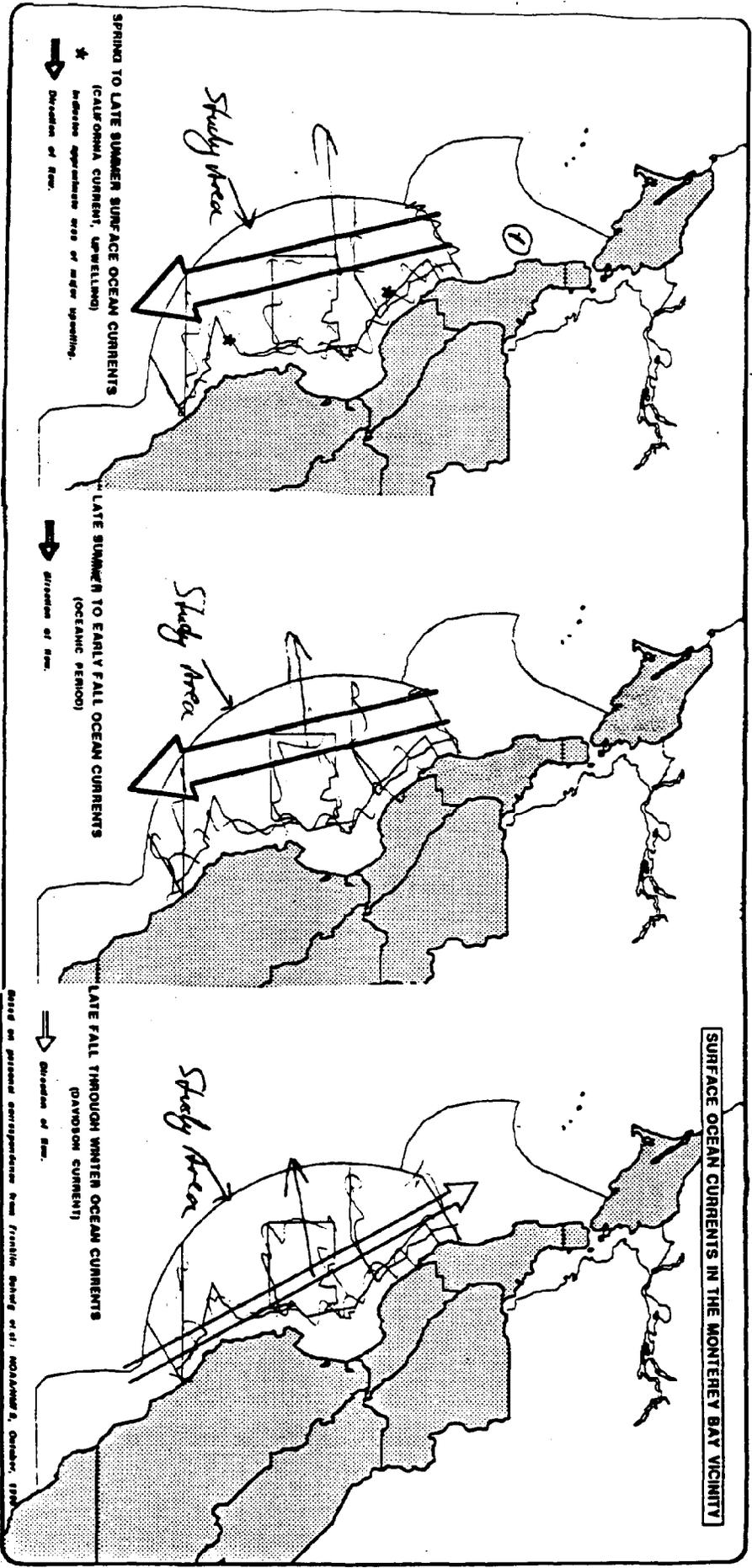
The core of the California Current off Point Sur lies about 60-125 miles (100-200 km) from the coast and features maximum equatorward velocities of less than 5-10 cm/s (Chelton, 1984). The offshore portion of southward flow is seen up to 600 miles (1000 km) offshore and extends deeper than 500 m, but the inshore section of the Current is limited to the upper 200 m over the continental slope (Hickey, 1979). Two velocity maxima per year are noted, in February-March and again in July-August (Chelton, 1984).

The CCS includes two other primary currents off central California; the California Undercurrent and the Davidson Current (Figure 5). The northward flowing Undercurrent transports water of relatively high temperature, salinity and nutrients and low dissolved oxygen from equatorial regions (Hickey, 1979). The Undercurrent is trapped along the continental slope, within 45-60 miles (75-100 km) of the coast off Point Sur (Chelton, 1984) at depths of over 200 m.

Northward flow extends to the surface from October through February; this portion of the poleward flow is referred to as the Davidson Current. Once it rises to the surface, it forms a wedge between the California Current and the coast. Its rate of flow is less than one knot. Upwelling stops during this period but returns in March with the return of the California Current. A second, weaker period of northward surface current is noted in late summer over the slope off San Francisco and Monterey. These northward periods of surface flow coincide with the core of the California Current moving offshore (Lynn and Simpson, 1987). The Undercurrent is weakest in spring and early summer. Velocities of up to 14 cm/s occur near the surface in December.

While this description gives a general view of the large-scale current patterns off central California, it must be stressed that this mean flow exhibits considerable interannual variability. Much larger variations in flow and intensity and direction that occur throughout the year at periods of 10 days and less are superimposed on seasonal patterns (Chelton et al., 1988). In addition, the

(11)



character of the CCS varies greatly with latitude (Hickey, 1979).

d. Upwelling and Eddies

Jets, eddies and meanders all contribute to water mass mixing, and make the flow of the CCS extremely complex. Highly transient coastal jets, or filaments, have typical surface currents of 50 cm/s, and are usually 12-30 miles (20-50 km) wide and 100-200 m deep (Brink, 1987). Eddies, some as large as 60 miles (100 km) in diameter, are able to transport seawater transverse to the mean flow; i.e., normal to the coast (Traganza et al., 1981, Tracy, 1990). Filaments of cold water may be carried more than 100 miles (160 km) offshore from upwelling centers off Point Sur (Breaker and Mooers, 1986) and Año Nuevo (Tracy, 1990). These filaments frequently display a high concentration of plant pigment, indicating their highly productive nature (Simpson et al., 1986).

Evidence suggest the cool nutrient-rich surface waters found in Monterey Bay are advected from sources outside the Bay. The area near Año Nuevo has clearly been identified as one source of this water (Tracy, 1990). Southward flow across the mouth of the Bay is indicated by sequences of satellite imagery over several consecutive days (Tracy , 1990), although no accurate estimates of current speed can be made at this time. As it flows south, some of this upwelled water makes its way into the Bay. When it is present, a front observed across the mouth of the Bay may inhibit exchange between the Bay and ocean (Breaker and Broenkow 1989; Tracy 1990).

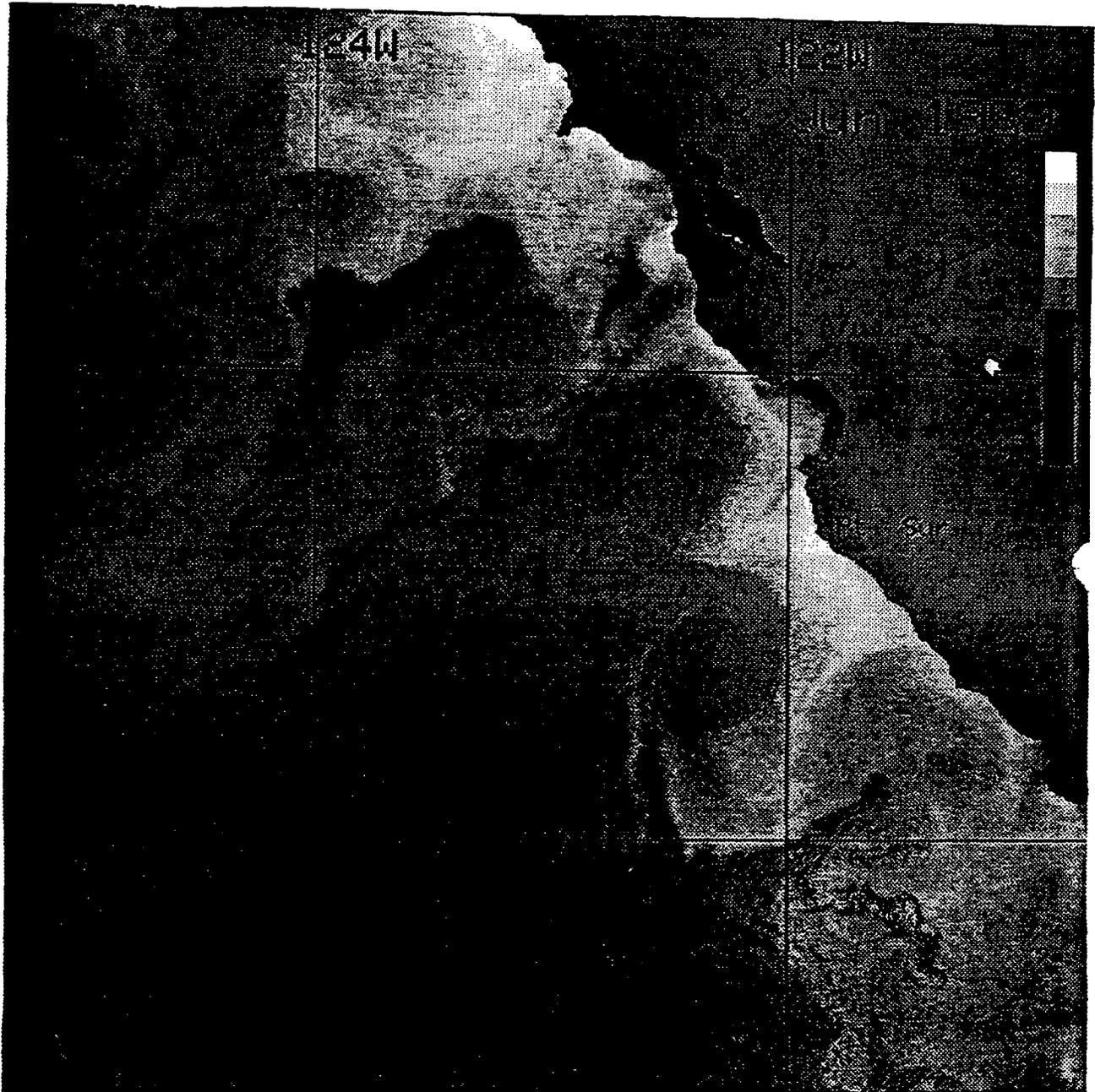
When northerly winds relax, a warm clockwise-rotating eddy

moves shoreward, bringing oceanic water into the Bay (Bolin and Abbott, 1963; Breaker and Broenkow, 1989; Farrell et al., 1990; Tracy, 1990). Water upwelled off Point Sur may flow northward into the Bay on occasion. Satellite imagery also shows upwelling off of Pillar Point with filaments of cold water extending south towards Monterey Bay (Figure 6).

This period of upwelling occurs almost continuously between March and October. There is then a short period of time, after upwelling stops, where the California Current is still the dominant current pattern but water conditions change slightly. This so-called oceanic period is marked by the absence of upwelling and a warming of the surface water temperature to more than 55°F (13°C).

As the surface waters are moved offshore and replaced by the cold, nutrient-rich waters from below the resultant upwelling introduces the nitrates, phosphates, and silicates that are essential for high phytoplankton production in the surface waters, which in turn are responsible for the highly productive waters of Monterey Bay.

Ekman pumping due to local spatial variations in wind stress (Breaker and Broenkow, 1989) and up-canyon flow (Bigelow and Leslie, 1930; Breaker and Breaker and Broenkow, 1989) have been proposed as mechanisms for local upwelling within Monterey Bay, but there is no hard evidence to support these theories at this time. Long-term satellite observations of surface temperature have not displayed localized upwelling centers inside of the Bay (Tracy, 1990) (Figure 6). Large internal waves of tidal frequency,



observed near the end of the Canyon (Shea and Broenkow, 1982), may move deeper waters up onto the shelf in that area.

e. Nearshore coastal currents

In addition to being influenced by the CCS, currents near the coast are affected by a variety of forces and boundary conditions, including local winds, upwelling, lateral and vertical mixing, tides, freshwater inflow, solar heating, bathymetric changes and El Niño episodes. Coastal currents are separate from the large-scale CCS flow and are primarily forced by local winds.

While Monterey Bay is unlikely to be impacted directly by variations in the CCS, its indirect effects will be felt through changes in coastal ocean conditions adjacent to the Bay. Coastal flow is much more transient and variable than that seen in the CCS, primarily because atmospheric variations produce a much stronger and more rapid ocean response in shallow water.

Current meter studies between the Farallones and Monterey Bay have measured flow predominantly alongshore to the south during the upwelling season (February-September) due to the prevailing northerly winds (Strub et al., 1987; Chelton et al., 1988). Typical current speeds are 20-30 cm/s alongshore and 5-10 cm/s onshore. Ship surveys and satellite imagery off central California reveal that water clearly travels large distances south during this time of year (Robson, 1990; Schwing et al., 1990a, Tracy, 1990). A net northward flow has been observed during the rest of the year (Strub et al., 1987). However, this seasonal cycle is of very small amplitude; alongshore velocities of 10-20 cm/s in either

direction occur throughout the year in response to changes in wind direction (Chelton et al., 1987).

South of Monterey Bay, currents are typically northward in all months except March-May, with an offshore surface flow and an onshore component at depth (Strub et al., 1987; Chelton et al., 1988). Coastal currents adjacent to the Bay not only vary in direction seasonally, and in response to changes in wind speed and direction over periods of 10 days and less, but can simultaneously flow in opposite directions at two nearby locations. Thus the coastal ocean near Monterey Bay is a zone where currents frequently converge from the north and the south. Currents in the Farallones as little as 9 miles (15 km) apart display very different cross-shelf patterns (Noble and Gelfenbaum, 1990). The flow field is also difficult to predict with any certainty; only about 50% of the variations in current can be attributed to the wind (Chelton et al., 1987; Noble and Gelfenbaum, 1990).

Few direct current measurements have been made within Monterey Bay, and most of those were very near shore (current meters) or of short duration (drogues). These limited measurements (ESI, 1978; Ecomar, 1981, cited in Breaker and Broenkow, 1989) indicate predominantly northward flow in a narrow nearshore band along the eastern edge of the Bay. The distribution of barnacle larvae is consistent with this pattern (K. Miller, pers. comm., 1990). The results of non-concurrent short duration current meter measurements in the Canyon (Shephard et al., 1979 and others, summarized in Breaker and Broenkow, 1989) are inconclusive. The flow within and

through the Canyon, and the effects of the Canyon on shelf currents are unknown at this time.

Most of what is known about flow in the Bay has been inferred from indirect evidence such as plankton and nutrient distributions, and in situ and remote temperature measurements (Broenkow and Smethie, 1978). Due to the large changes in the Bay's water structure that may take place over very short time periods (about one day during the upwelling season), currents inferred from shipboard surveys, which frequently take several days to complete, may not be reliable. On the other hand, flow inferred from snapshots of remotely sensed data, with no temporal coverage, may also be misleading. Due to the presence of large internal waves in the Bay (Shea and Broenkow, 1982), abrupt bathymetric changes, and likely importance of friction, estimates of current speed and direction based on differences in the Bay's ocean structure are probably not realistic. Even with these caveats, however, certain current patterns have been identified, although there are known strong, persistent currents within Monterey Bay.

f. Freshwater input

Freshwater flow from lands adjacent to the study region is low when compared to freshwater flows to the ocean in Northern California, Oregon and Washington. However, freshwater flow used to be higher in the central California area prior to diversion of water for agricultural and urban use. The Pajaro and Salinas rivers, which are adjacent to the central portion of the study area, provide the largest long-term average daily flow into the

study region and drain the largest basins (Figure XX). The northern portion of the study area is almost entirely adjacent to one watershed. (Only a small portion of the Marin County watershed is included to the north of the Golden Gate). The southern portion of the study area is adjacent to one thin coastal watershed draining the narrow coastal margin of the Big Sur and Los Padres Forest across Monterey and San Luis Obispo counties. The highest freshwater yield per unit area flows from the Big Sur River. This river is located in one of the small, localized, drainage basins adjacent to the steep coastal terrain of the Big Sur and is probably less impacted by reservoirs, irrigation withdrawals, and municipal withdrawals as it is entirely within a protected forested area..

All together, USGS monitoring stations estimate a total of 1,228 cubic feet of fresh water enters the study area every second. (Table X).

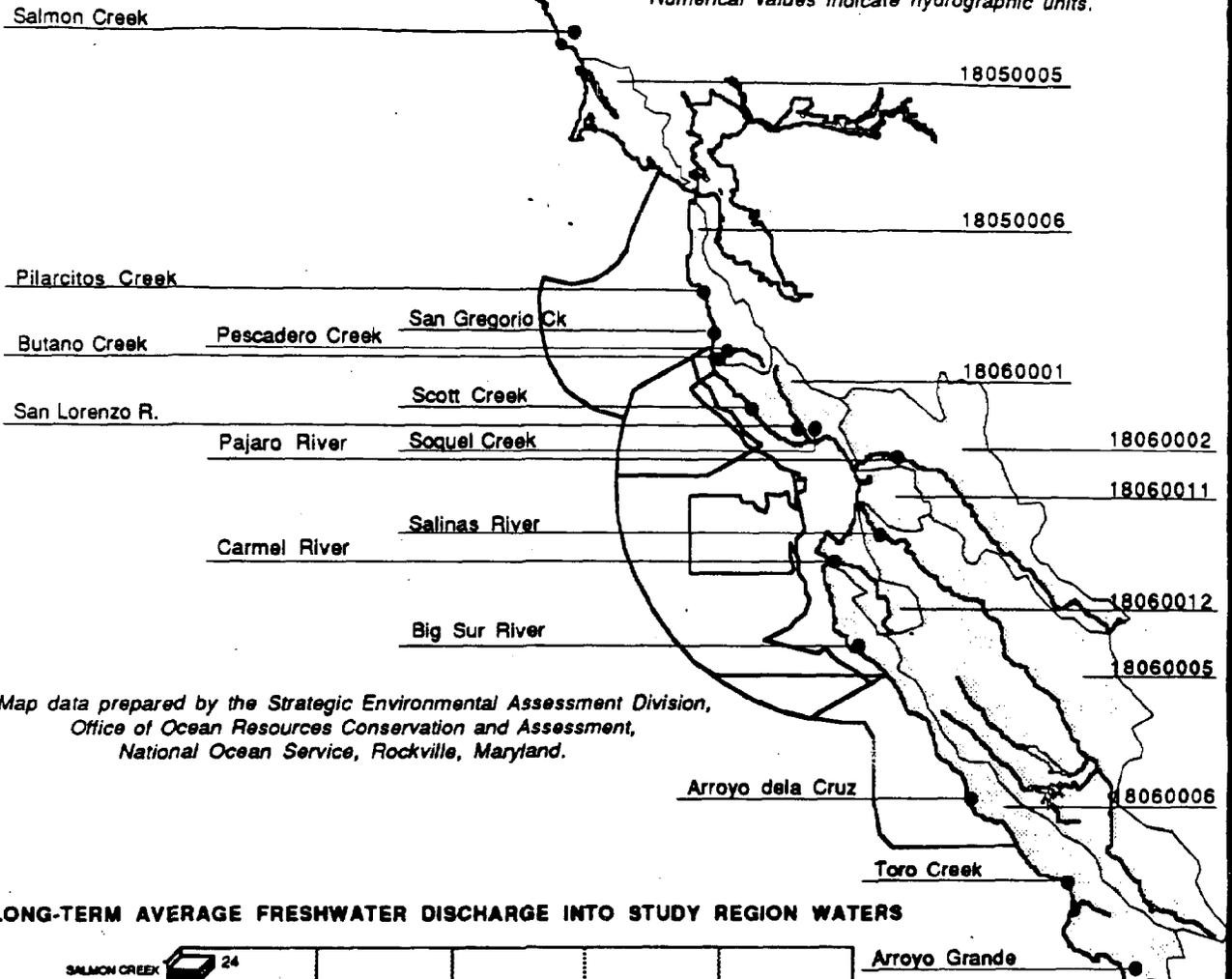
4. Water Quality

The water quality in the central California region is known to be very good (MMS, 1987). The periodic upwelling and extensive, year-round mixing with the open ocean result in well-buffered, highly productive and well-oxygenated offshore waters.

Water quality data from the National Status and Trends (NS&T) Program, as well as State Monitoring programs, can be used to provide information on whether the water quality in the study area is improving or declining. It may also aid in assessing possible effects of contaminants on the health of the Monterey Bay

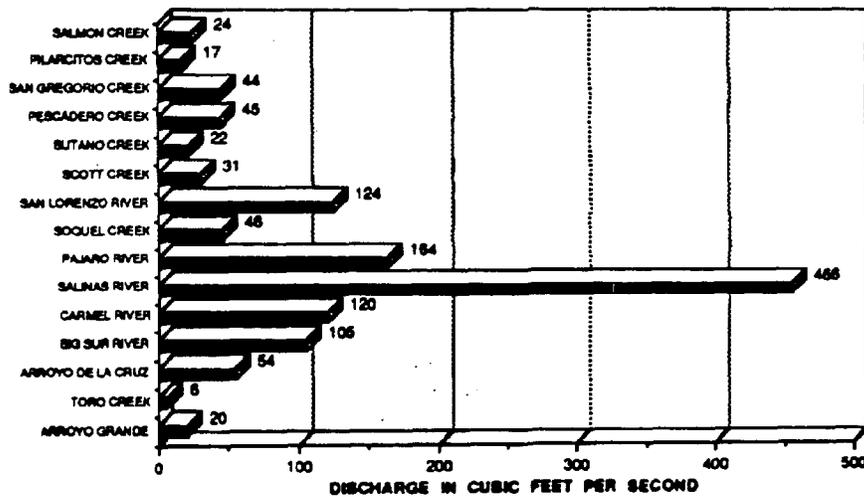
RIVERINE INPUT TO THE MONTEREY BAY NATIONAL MARINE SANCTUARY STUDY AREA

Points represent United States Geological Survey flow gauge stations.
Numerical values indicate hydrographic units.



Map data prepared by the Strategic Environmental Assessment Division,
Office of Ocean Resources Conservation and Assessment,
National Ocean Service, Rockville, Maryland.

LONG-TERM AVERAGE FRESHWATER DISCHARGE INTO STUDY REGION WATERS



Source: U.S. Geological Survey. Obtained through the Office of Ocean Resources
Conservation and Assessment, National Ocean Service, Rockville, Maryland.

LONG-TERM AVERAGE FRESHWATER DISCHARGES INTO STUDY REGION WATERS

STATION NAME	COUNTY	HYDROLOGIC UNIT CODE	DRAINAGE AREA AT STATION (Square Miles)	LONG-TERM MEAN DISCHARGE (cfs)	YIELD (Mean discharge/cfs/sq. mi.)	PERIOD OF RECORD	TIME PERIOD (# of Years)
Salmon Creek at Bodega	MARIN	18010111	16	24	1.50	1962-76	15
Pilarcitos Creek at Hall Moon Bay	SAN MATEO	18050006	27	17	0.63	1966-86	21
San Gregorio Creek at San Gregorio	SAN MATEO	18050006	51	44	0.86	1970-86	17
Pescadero Creek near Pescadero	SAN MATEO	18050006	46	45	0.98	1952-86	53
Buano Creek near Pescadero	SAN MATEO	18050006	18	22	1.20	1962-75	14
Scott Creek/Dove Linka Creek near Davenport	SANTA CRUZ	18060001	25	31	1.24	1959-74	16
San Lorenzo River at Santa Cruz	SANTA CRUZ	18060001	115	124	1.08	1953-60	8
Soquel Creek at Soquel	SANTA CRUZ	18060001	40	46	1.15	1952-86	35
Pajaro River at Chittenden	SANTA CRUZ	18060002	1186	164	0.14	1940-86	47
Salinas River near Spreckels	MONTEREY	18060005	4156	456	0.11	1930-86	57
Carmel River near Carmel	MONTEREY	18060012	246	120	0.49	1962-86	25
Big Sur River near Big Sur	MONTEREY	18060006	47	105	2.23	1950-86	37
Arroyo de la Cruz near San Simeon	SAN LUIS OBISPO	18060006	41	54	1.32	1951-79	29
Toro Creek near Morro Bay	SAN LUIS OBISPO	18060006	14	6	0.43	1971-78	8
Arroyo Grandaal Arroyo Grand	SAN LUIS OBISPO	18060006	102	20	0.20	1940-86	47

SOURCE: U.S. Geological Survey. Through the Office of Ocean Resources Conservation and Assessment, National Ocean Service, Rockville, Maryland.

ecosystem. Data on trace metals and organics are available from three components of the ecosystem from the NS&T data set: sediments, bivalves and fishes. Mussel contaminant data are of secondary value relative to sediment data for establishing the spatial distribution of contamination. However, examination of the distribution of sites [nationally] with the highest levels of contamination has shown that organic contaminants, copper, silver and lead have a strong affinity with urban areas. No contaminants are strongly associated with rural areas (NOAA Tech. Memo. NOS OMA 49).

Within the central part of the study area four sites are sampled: two for sediments, fish and bivalves and two additional sites for fish and sediments only. In the southern portion one site is used to sample mussels only. A fourth site, also used to sample mussels only, is located to the north of the study area but within the Gulf of the Farallones NMS.

Water quality data from the NS&T Program is only available for the past three years. As such it is too early to confidently predict the existence of any trends in water quality. However, as the Monterey Sanctuary becomes operational and additional data is collected, it is a goal of the Sanctuary to use this data for long-term management issues.

Compared to other areas Nationwide the offshore sample sites used in the Monterey Bay study area do not have elevated levels of contaminants. However, the estuarine waters of the study area are closed to shellfishing as a result of high Coliform counts.

Marine water quality is also monitored by the California Water Resources Control Board through its State Mussel Watch Program and the National Pollutant Discharge Elimination System (NPDES) pursuant to the Clean Water Act, as well as by NOAA's National Status and Trends Program. The State Mussel Watch program, which began in 1977, is operated under interagency agreement with the Water Resources Control Board by the California Department of Fish and Game, Marine Pollution Laboratory, and involves monitoring toxic pollutant levels in resident and transplanted California mussels, resident Monterey Bay mussels, and transplanted freshwater clams at selected stations from coastal, bay, and estuarine areas. Hayes and Phillips (1987) report the major trends in trace metals and synthetic organic substances identified after a decade of monitoring in this program. There is a total of 81 monitoring stations managed by CDF&G via the Toxic Substance Monitoring (TSM) Program and the State Mussel Watch (SMW) Program within the watersheds of the Monterey Bay study area. 39 of these exceed standard criteria (SWRCB, 1987, TSM Report No. 89-1; and SWRCB, 1987, SMW Report No. 87-2). Those measured which exceed "criteria" include cadmium, which is often measured in high concentrations since most of it comes from natural sources.

In addition, a few specific areas within Monterey Bay have shown DDT concentrations above detectable levels. The California Department of Health and Human Services (DHS) is sampling the Bay's fish population for any toxins including pesticides and the State Mussel Watch Program is collecting data that show certain non-point

and point source coastal discharges are degrading water quality in specific areas.

For example, State monitoring results show the following:

1) Resident California mussels from the Monterey Harbor area contain higher lead levels than elsewhere in California or worldwide.

2) Freshwater clams transplanted to the innermost freshwater drainage (closer to the agriculture areas) that lead to Monterey Bay contain the highest levels of 26 pesticide and pesticide degradation products ever measured during the program. Chlordane, endosulfan, and DDT are some of the substances identified.

3) The highest levels of pesticides (dacthal, endosulfan, and endrin) ever measured in California mussels were found in mussels transplanted to the outer, more saline portions of the drainage to Monterey Bay.

4) High levels of tributyltin (used in anti-fouling paints) are found in mussels transplanted to semi-enclosed harbors with extensive boating activity. Low-levels of tributyltin (0.083 ppm, wet weight) were found in mussels in Elkhorn Slough.

The high level of lead found in the mussels of Monterey Harbor was traced to a slag heap of lead smelting waste which had been placed on the inner harbor shore as railroad fill. Lead isotopic analyses were used to identify this slag deposit as the principal source of the lead (Flegal et al., 1987). Lead (and zinc) may also be leaching into the bay from the wastes associated with the more than 30 canneries that used to operate along Cannery Row (Loehr and

Collias, 1983).

Elevated levels of mercury have been found in mussels at several locations along the California coast, including Año Nuevo Island. All sample locations are the site of very large pinniped and marine bird colonies. The elevated levels of mercury appear to be due to natural perturbations of the mercury cycle by higher organisms with anthropogenic sources being of secondary importance (Flegal *et al.*, 1981).

Petroleum hydrocarbon concentrations were measured using Mussel Watch techniques. Resident mussels were shown to have higher than expected petroleum hydrocarbon body burdens in Carmel Bay, an area thought to be relatively contaminant free (Martin and Castle, 1984).

A wide range of pesticides have been entering the drainage to Monterey Bay from the surrounding agriculture areas for a long period of time. Studies other than the Mussel Watch Program have indicated other adverse effects on the water quality of the bay. The State Board Toxic Substances Monitoring program and the Department of Food and Agriculture studied DDT levels in soils and sediments of the Blanco Drain Area. They concluded that undegraded DDT from past legal agricultural use remains at significant levels in soils and becomes available to aquatic life when it is eroded in to waterways (Hays and Phillips, 1987). Both agencies suggest that better on-farm soil management practices could reduce the amount of DDT reaching the bay. DDT and its degradation products were found in the tissues of all eight species of marine fishes caught and

analyzed from Monterey Bay (Shaw, 1972).

California Department of Fish and Game also inventory's fish kills within waters of the state and attempts to correlate the kills to causes including those due to degraded water quality. **Table X** lists fish kills by county for 1985 to 1989 and shows that many of the kills can be attributed to a combination of both point and non-point source pollution.

The California Department of Fish and Game in cooperation with the California Department of Health Services is conducting an aquatic toxicology evaluation program in Monterey Bay (Welden, 1988). The main objectives of the program are to determine the average chemical contaminants found in a range of the most common commercial and sport-caught fish in the bay and to give a current risk-assessment of the effects of consuming them. This study was scheduled to be released in the fall of 1989. Until further information is available and analyzed the California Regional Water Quality Control Board (RWQCB), Central Coast Region, has determined in its Draft Water Quality Control Plan (1989) that it can only classify Monterey Bay as a Potential Water Quality Limited Segment.

FISH KILLS BY COUNTY: 1985 THROUGH 1989

COUNTY	LOCATION	DATE	CAUSE	COMMON NAME	NUMBER KILLED
MARIN	FIFTH VALLEY CREEK BELOW VALLEY INN	FEB - 85	CHLORINE	RIFLE SCULPIN	45
MARIN	STORM DRAIN OUTLET BEHIND DORTY DRIVE	JUL - 86	UNKNOWN	STRIPED BASS	6
MARIN	MILL VALLEY CREEK	OCT - 88	UNKNOWN	TROUT	4
				SCULPIN	6
MONTEREY	CARMEL RIVER - SCARLET WELL	JUL - 85	UNKNOWN	RAINBOW TROUT	5000
				STCKELBACK	4000
				EEL	500
MONTEREY	SALINAS RIVER ONE MILE FROM MOUTH EAST OF HIGHWAY 1 BRIDGE	AUG - 85	PESTICIDES	SUCKER	1000
				CARP	1000
				RAINBOW TROUT	1
MONTEREY	ARROYO SECO R AT THORN ROAD FISH LADDER	APR - 87	UNKNOWN	RAINBOW TROUT	100
MONTEREY	TEMLADERO SLOUGH	SEP - 87	AMMONIA	RAINBOW TROUT	1950
SAN LUIS OBISPO	SHELL BEACH AT HIGHWAY 101 ALONG BLUFF	DEC - 85	PETROLEUM	UNSPECIFIED	5
SAN LUIS OBISPO	ATASCADERO LAKE	MAY - 86	HIGH TEMPERATURE (LOW DISSOLVED OXYGEN)	RAINBOW TROUT	500
				CHANNEL CATFISH	50
SAN LUIS OBISPO	AVILA BEACH INTAKE COVE OF DIABLO CANYON	APR - 87	FERRIC SULPHATE	ROCK PRICKLEBACK	11
SAN LUIS OBISPO	ATASCADERO LAKE	APR - 88	COLUMNARIIS DISEASE	BROWN BULLHEAD	5000
				CARP	1
				BLUE GILL	2
				RAINBOW TROUT	2
SAN LUIS OBISPO	SAN SIMEON CREEK	SEP - 88	HIGH TEMPERATURE (LOW DISSOLVED OXYGEN)	RAINBOW TROUT	200
				STARRY FLOUNDER	3
				SCULPIN	1
SAN MATEO	SAN PEDRO CREEK FROM TERRA NOVA BLVD	JAN - 85	INORGANIC CHEMICALS/ACID	STCKLEBACK	25
SAN MATEO	BUTANO CREEK, LOWER END	MAY - 86	PESTICIDES/THODAN, METHYL PARATHION	RAINBOW TROUT	500
				SALMON	50
				SCULPIN	500
SAN MATEO	SAN PEDRO CREEK BTWN. N. FORK AND ADOBE BRIDGE	JAN - 87	CHLORINE	RAINBOW TROUT	4040
SAN MATEO	SAN PEDRO CREEK CONFLUENCE WITH N. FORK	MAR - 87	CHLORINE	RAINBOW TROUT	700
SAN MATEO	SAN CARLOS RIVER	OCT - 89	INDUSTRIAL SPILL (PAINT)	UNSPECIFIED	(7)
SANTA CRUZ	KELLY LAKE	JUL - 87	LOW DISSOLVED OXYGEN	SACRAMENTO BLACKFISH	20
				THREADFIN SHAD	20
				SCULPIN	50000
				BLUEGILL	10

SOURCE: NOAA's Fish Kill Inventory/Strategic Environmental Assessment Division, Office of Ocean Resources Conservation and Assessment, National Ocean Service, Rockville, Maryland, 1989.

C. Habitats

1. Introduction

The Monterey Bay area is located in the Oregonian province subdivision of the Eastern Pacific Boreal Region. This province is characterized by a rich cold-temperate flora and fauna (Briggs, 1979). The Monterey Bay area, however, is home to a number of warm water invertebrate species characteristic of the California province to the south. This overlap and co-occurrence of warm and cold water species contributes to the diversity of the living natural resources in the Monterey Bay area.

Habitats can be characterized by their water depth, distance from shore, and the type of substrate. The habitats in the Monterey Bay area are unusual because of the many diverse types that are found together in a relatively confined area (Figure 8). The six types of habitats found in the bay area are: 1) submarine canyon habitat, 2) nearshore sublittoral habitat, 3) rocky intertidal habitat, 4) sandy beach intertidal habitat, 5) kelp forest habitat, and 6) estuarine/slough habitat.

2. Submarine Canyon Habitat

Approximately 676 square nautical miles of canyon exist in the study area (NOAA Charts 18680 and 18700). This habitat is found over the canyon beyond the continental shelf in waters over 200 m deep. The waters of the bay support oceanic species of fish, birds, and marine mammals. Upwelling from the canyon supports most of the primary productivity for the entire bay. The canyon edge serves as a feeding area for endangered blue and fin whales,

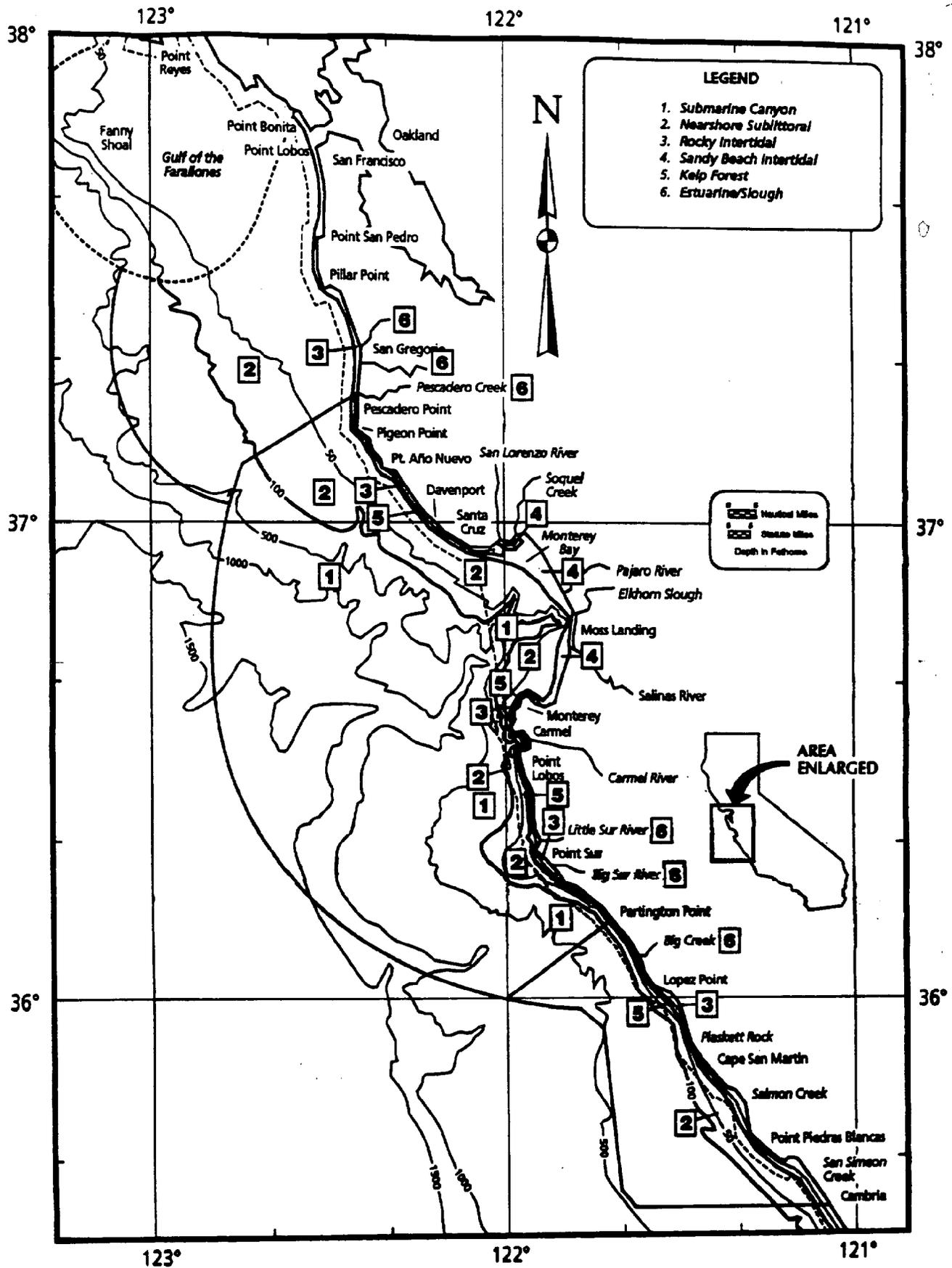


Figure 8. Habitat Types within Monterey Bay Study Area (NOAA, 1982).

Pacific white-sided dolphins, northern right whale dolphins, Risso's dolphins, Dall's porpoise, and possibly the blue shark. Meso- and bathypelagic fishes include the lanternfish (Myctophidae), sablefish, deepsea sole, and Pacific rattail. Fish, as well as euphausiid crustaceans (krill) and other organisms, compose a "deep scattering layer" that undergoes vertical migrations to the surface waters. The benthic community of the canyon is virtually unstudied except for an occasional grab or trawl taken by Moss Landing Marine Laboratories. Recent video transects of the canyon down to 400-500 m by the Monterey Bay Aquarium Research Institute do, however, indicate a considerable diversity of organisms. Sponges, gorgonians, starfish, brittle stars, crinoids, and sea urchins appear to be the dominant large invertebrates (James Nybakken, pers. comm., 1989).

A team of USGS and NOAA workers using the submersible ALVIN discovered numerous biological communities nourished by seepages of sulfide and methane-rich fluids from the fan or valley-floor sediments. These deep-sea communities are significant as they not only increase our understanding of the fluid-dynamics of large deep sea sediment fans but also provide basic knowledge of abyssal communities that include species also found in hot hydrothermal vents at spreading centers (EEZ News, October, 1989).

3. Nearshore Sublittoral Habitat

This habitat is found in the nearshore waters of the continental shelf in depths from just beyond the surf to 200 m depth. The food chain is based on planktonic productivity

supported by upwelling of nutrient-rich waters from the Monterey Canyon. Pelagic organisms found in this habitat include phytoplankton and zooplankton, squid and octopus, and most of the important commercial fish (salmon, albacore, rockfishes, mackerel, and anchovy). Marine birds and California sea lions feed throughout the habitat. Shallow nearshore inhabitants include Harbor porpoise and Minke whales.

The nearshore benthic habitat is characterized by a soft bottom composed of unconsolidated sand and mud sediments. This is the most extensive bottom habitat in Monterey Bay. Two major groups of invertebrates are found in this habitat: 1) the infauna, which live buried within the sediment, comprise about 90 percent of all the bottom-dwelling organisms; and, 2) the epifauna, which live on or crawl or move over the bottom. Both groups are patchily distributed throughout the bay. Many benthic organisms have a pelagic phase in their life histories (Nybakken, 1982).

The subtidal invertebrate fauna of the shallow offshore waters are found in a far greater number of species than are the intertidal fauna. For example, the sandy intertidal habitat has only 29 species and/or genera, the subtidal habitat includes more than 400 species and/or genera. However, less is known about these subtidal species than is known about the intertidal species (James Nybakken, pers. comm., 1989).

The dominant invertebrate groups in the shallow subtidal waters are polychaetes, molluscs, and crustaceans. Crustaceans are dominant in shallow areas; polychaetes are dominant in deeper

waters.

4. Rocky Intertidal Habitat

This habitat is found on rocky substrate between the lowest tidal level and the highest tidal level. Organisms living in this area must be able to withstand periodic desiccation, high temperature and light, low salinities, and strong wave action (Nybakken, 1982). Variation in the degree of exposure to these environmental factors can create marked zonation patterns within this habitat (Foster et al., 1988). Marine plants are primarily red, brown, and green algae. The invertebrates include mostly sessile species such as mussels, barnacles, and anemones. Mobile grazers and predators include crabs, amphipods, littorine snails, limpets, sea stars, and sea urchins. Tidepool fish include the striped surfperch, tidepool sculpin, tidepool snailfish, and cabezon.

Rocky intertidal habitats are probably the most well studied of all habitats in and adjacent to Monterey Bay. These habitats are not uniform within the bay, but vary in composition within short distances. All of the Areas of Special Biological Significance (ASBS) found within the study area have rich abundances of invertebrate species. In addition, Asilomar Beach and Point Sur are well known areas for invertebrates and the Fitzgerald Marine Reserve has one of the largest intertidal reefs in California supporting an extremely diverse and abundance array of invertebrate species.

5. Sandy Beach Intertidal Habitat

Sandy beaches are the dominant intertidal habitat in Monterey Bay. The environmental conditions that exist in this habitat between high and low water require almost all organisms to bury themselves in the sand. This is a very dynamic habitat with constantly shifting sands caused by wave action and the longshore transport of sand. The overall productivity of this habitat is lower than that for rocky intertidal habitats (Nybakken, 1982).

Benthic diatoms are the only marine algae that may be present. Oakden and Nybakken (1977) found 29 genera or species of animals in transects taken over the course of a year. Polychaete worms, bivalve molluscs, and crustaceans were the predominant invertebrates found. Sand dollars and gastropod molluscs are also found here (Wilson, 1986). The only fish that are common are those that use sandy beaches for spawning, e.g., the surf smelt.

6. Kelp Forest Habitat

There are approximately 200 nautical miles of kelp in the study area. There is continuous stretch of kelp along the coast from Año Nuevo to Cambria excluding the area from Santa Cruz to Monterey where the sandy substrate is unsuitable for kelp holdfast attachment. North of Año Nuevo kelp distribution is sparse and almost non-existent north of Pescadero Point.

Kelp is one of an order of large brown algae. It attaches to rocky substrate and grows in water depths from about 2 m to 20 m. The floating portions of these plants form dense canopies on the sea surface. Kelp forests provide critical habitat for encrusting

animals such as sponges, bryozoans, and tunicates, as well as for juvenile fish, molluscs such as abalone, algae, and for other invertebrates. Fish associated with kelp beds include greenling, lingcod, bocaccio, and many species of surfperches and rockfish. Gray whales have been reported to feed near kelp forests and to seek refuge in them from predatory killer whales (Baldrige, 1972). Kelp also provides a food resource for fish, and for grazing and detritus-feeding invertebrates, such as isopods and sea urchins. Predators, such as sea stars and sea otters, are also active there.

Kelp detached and transported during storms provides a source of food for other local habitats. Sandy beach fauna utilize the kelp washed up on the beach. Kelp material that sinks may provide a source of energy for deep water benthic organisms. Fish, particularly juvenile rockfish, utilize the habitat provided by rafts of drifting kelp (Foster and Schiel, 1985).

Sea otters and harbor seals are commonly associated with kelp forests in this area, and otter biology and the effects of sea otters on kelp communities have been the subject of numerous completed (reviewed in Van Blaricom and Estes, 1988) and continuing studies. The exact effect that sea otters have on the community structure of the Monterey Bay kelp forests remains unclear. Sea otters are known to prey on sea urchins. Sea urchins are known grazers on kelp. Comparisons of kelp forests with and without sea otters have shown that sea otter predation on sea urchins has a beneficial effect on the distribution and growth rates of kelp. Sea otters have been described as "keystone species" which play a

major role in determining community structure (Estes and Palmisano, 1974). However, because other factors also affect kelp distribution and abundance, this role of sea otters is not totally accepted (Foster and Schiel, 1985). Kelp does appear to be increasing in distribution in areas where sea otters live (Reidman, 1986).

7. Estuaries and Sloughs

Estuaries provide some of the most productive habitats in the world. These habitats are critical not only for the local ecosystems in which they appear but also ecosystems elsewhere through the species they support (NOAA and FWS, 1991). In the Monterey Bay area the adjacent estuaries, slough and wetlands not only provide critical habitat for some stage in the life-cycle of a number of plants, fish, shellfish and other wildlife but also provide flood damage protection, protection from storm and wave damage, water quality improvement through filtering and processing of agricultural and urban wastes, and recharge of aquifers (NOAA and FWS, 1991).

The dramatic loss of original coastal wetlands (75% in California) as well as Nationwide emphasizes the value of those remaining estuaries for the species that depend upon them for their survival. For example, the tidewater goby Eucyclogobius newberryi (more common in the southern portion of the study area), and the stickleback Gasterosteus aculeatus leiurus (more common in the northern portion of the study area) and both candidate species for Federal listing as species of special concern due to their limited

numbers and distribution, are distributed throughout the estuarine and slough habitats of the Monterey Bay area (Cailliet, pers. comm. 1991).

In the center of Monterey Bay and east of Moss Landing is Elkhorn Slough, the largest remaining coastal wetland area between Morro Bay and San Francisco Bay. The importance of Elkhorn Slough to the area's ecosystem and the public was recognized when it was designated a National Estuarine Research Reserve in 1981.

Numerous other smaller but also valuable estuaries, sloughs and wetlands exist throughout the study area, especially at the mouths of the major rivers that enter the Monterey Bay area, such as Pescadero and Soquel Creeks, and the San Lorenzo, Pajaro, Salinas, Carmel, Little Sur and Big Sur Rivers. Other smaller areas of freshwater input to the ocean include, but are not limited to; Pillar Point marsh, Miramonter Point wetlands, Parisima Creek, Tunitas Creek, San Gregorio Creek, Pompino Creek, Mill Creek, Pescadero Marsh, Big Creek, Limekiln Creek, Carpolare Creek, Salmon Creek, Elkhorn Slough, Laguna Salada Wetland, and San Pedro Creek.

In total these areas where rivers meet the sea provide a rare and critical series of unique habitats for a wide variety of species that contribute to the national significance of the Monterey Bay area.

D. Biological Resources

1. Introduction

The diversity and abundance of species in the Monterey Bay area can be attributed in part to the location of the bay within the broad transition zone between the Oregonian Province to the north and the warm water California Province to the south. Not only do many northern and southern species coexist in the transition zone but there are also endemic species which seem to survive only in the transition. The fossil record suggest that this transition zone has existed for many millions of years, and that it has been a likely site of evolution for species that later became established as characteristic species of either Oregonian or Californian Provinces.

Thus Monterey Bay supports a wide array of temperate cold-water species, with occasional influxes of warm-water species. This species diversity is directly related to the diversity of habitats described above and the location of Monterey Bay within a broad transition zone providing a complex gradient of changing environment in which the relative proportions of species changes from north to south. All the biological resources within the Sanctuary will be protected by Sanctuary designation including but not limited to, plankton, algae, invertebrates, fish, seabirds, turtles and marine mammals.

2. Plankton

Plankton species present in the Monterey Bay area are primarily characteristic of the cold-water California region, but

also include a few warm-water species (Holton et al., 1977; Riznyk, 1977; Garrison, 1979). Upwelling from the canyon carries some deep water species close to shore.

Diatoms are the primary component of the phytoplankton. The spring to late summer period of upwelling with its nutrient-rich waters causes a seasonal variation in the standing stock of phytoplankton. The highest primary productivity is associated with the upwelling period; the lowest during late fall through winter when the warmer Davidson Current predominates and upwelling ceases. Dinoflagellate blooms occur in the fall in the warmer waters. Satellite imagery indicates that phytoplankton concentrations are frequently higher in the northern regions of the bay, with low phytoplankton waters entering the bay from the south around Point Pinos (Hauschildt, 1985).

Unlike phytoplankton, which are limited to the euphotic zone (approximately the upper 100 m), zooplankton occur at all depths and are able to migrate vertically up to several hundred meters. The phytoplankton are fed upon by a variety of zooplankton such as ciliates, copepods, euphausiids, and pelagic tunicates.

Zooplankton are in turn an important food source for fish and other organisms. Dense concentrations of euphausiids occur in the surface waters and in deeper layers from 100 to 400 m from April to November (Barham, 1956; Schoenherr, 1988). These swarms serve as food for a variety of adult fishes, whales and sea birds (Harvey, 1979; Schoenherr, 1988), and for juvenile fishes which prey on euphausiid eggs and larvae (NOAA Rockfish Recruitment Cruise

Reports, 1986-1988). Dense swarms of gelatinous pelagic tunicates also occur periodically from early spring to mid-fall (Barham, 1956). In fall 1986, aggregations of euphausiids, dominated by the krill Euphausia pacifica, attracted a large number of endangered blue whales to feed in Monterey Bay (Schoenerr, 1988).

3. Algae

Large marine algae, or seaweeds, are diverse and abundant in the Monterey Bay area. The extent of this diversity is shown by the presence of over 450 of the 669 species of algae described for California (Abbott and Hollenberg, 1976). The area has the largest marine flora of the temperate northern hemisphere, with numerous endemic species and the only population of one large understory kelp (Eisenia arborea) between southern California and Canada. It has been suggested that Monterey Bay may represent a biogeographic boundary for the distribution of algae; this, however, may be because the bay area has been studied more intensively than others (reviewed in Foster et al., 1988).

The seaweeds of the Monterey Bay area are composed of three main phyla: red algae (Rhodophyta: 69 percent of all species), brown algae (Phaeophyta: 20 percent), and green algae (Chlorophyta: 10 percent). They occur primarily in areas of rocky substrate and only rarely in water deeper than 40 m (Abbott and Hollenberg, 1976). The most extensive algal communities are dominated by forests of giant kelp (Macrocystis pyrifera) and bull kelp (Nereocystis leutkeana). Bull kelp rejuvenates itself annually;

giant kelp is generally perennial, growing all year.

Kelp beds are continuous from San Simeon in the south of the study area to Monterey city. Within Monterey Bay from Monterey City to south of Santa Cruz there are no kelp beds due to the sandy substrate of the shore. Kelp beds are thick off of Santa Cruz city and intermittent up to Año Nuevo. Kelp is rare from Año Nuevo to Half Moon Bay, the northern limit of its distribution. The Santa Cruz County coast between Terrace Point and Point Año Nuevo has changed from almost total dominance of giant kelp in 1911 to an increase in the number of bull kelp stands (Yellin et al., 1977). Although sea otters may produce further changes, the primary factors affecting these kelp forests appear to be storms and substrate composition (reviewed in Foster and Schiel, 1985).

Table X shows a brief listing of some of the types of algae associated with the different habitats encompassed by the Sanctuary study area. In addition to the marine and coastal types of algae the estuary and slough habitats provide sheltered areas for an abundant growth of marine algae as well as specifically adapted vascular plants such as eelgrass and pickleweed that in turn provide rich micro-habitats for other organisms.

4. Invertebrates

The Monterey Bay area has one of the most diverse and species-rich invertebrate faunas of any marine area of similar size in the entire world (James Nybakken, pers. comm., 1989). This diversity can be illustrated by the following facts: 1) Of the 33 or so invertebrate phyla, the only ones that have not been collected in

Table 1. ²

Representative Algae Associated with the Diverse Habitats of the Monterey Bay Area.

<u>Habitat</u>	<u>Representative Algae</u>	<u>Classification</u>	<u>Common Name</u>
Submarine Canyon	phytoplankton	<u>Chaetoceros</u> spp.	diatoms
	phytoplankton	<u>Ceratium</u> spp.	dinoflagellates
Nearshore Sublittoral	No suitable substrate		
Sandy Intertidal	phytoplankton		diatoms
Kelp Beds	Kelp	<u>Macrocystis pyrifera</u>	giant kelp
	Kelp fucalean algae	<u>Nereocystis leutkeana</u> <u>Cystoseira</u>	bull kelp
Rocky Intertidal	red algae	<u>Endocladia</u> spp.	
	brown algae	<u>Fucus</u> spp.	rockweed
	green algae	<u>Ulva</u> spp.	sea lettuce
Estuary/ Slough	phytoplankton		diatoms
	green algae	<u>Enteromorpha intestinalis</u>	
	red algae	<u>Gracilaria lemaneiformis</u>	
	Flowering Plants	<u>Zostera marina</u> <u>Salicornia</u>	eelgrass pickleweed

Monterey Bay are Loricifera and Pogonophora; 2) For some groups (e.g., shallow water starfish), Monterey Bay may well be the richest area in the world; 3) There may be more species of molluscs in Monterey Bay than in any other locality outside of tropical or semi-tropical areas (Smith and Gordon, 1948, in J. Nybakken, pers. comm.). Those researchers listed 725 species of molluscs from the Monterey Bay alone. For limpets and chitons, the bay region is the richest and most diverse in the world (David Lindberg, pers. comm., 1989); 4) Monterey Bay is a faunal break on the Pacific Coast for molluscs (Valentine, 1966). The bay is the northern limit of the range for many southern species and the southern limit of the range for many northern species; 5) Monterey Bay has a relative abundance of some species which are uncommon or rare where they occur. This includes the strange animal named Poeobius, which has been considered a missing link between the annelids and the sipunculans. Also, the cnidarian Tetraplatia, which is rare in the world's oceans, has been taken in abundance in Monterey Bay.

The distribution, species composition, and abundance of the invertebrate fauna in Monterey Bay are determined by many factors. The submarine geology and the types of rocky substrate or unconsolidated sediments, the submarine canyon and associated upwelling, the offshore currents and circulation patterns, the kelp forests, and the presence of mammal predators all influence the niches occupied by the various species (Table X).

The rocky intertidal habitat support the widest array of invertebrate species (Ricketts et al., 1985; Smith and Carlson,

Table 1. Representative Invertebrates Associated with the Diverse Habitats of the Monterey Bay Area (J. Nybakken, pers. comm., 1989; Elkhorn Slough NERR, Management Plan).

<u>Habitat</u>	<u>Representative Invertebrates</u>	<u>Classification</u>	<u>Common Name</u>
Submarine Canyon	hexactinellid	Porifera	glass sponge
	gorgonians	Cnidaria	soft coral
	euphausiids	<u>Euphausia pacifica</u>	krill
	bivalve	Calyptogena	clam
	crinoids	Echinodermata	sea lily
Nearshore Sublittoral	polychaetes	<u>Aricidea</u> sp.	bristle-worms
	bivalves	<u>Macoma</u> sp.	burrowing clam
	snails	<u>Olivella biplicate</u>	olive snail
	crabs	<u>Blepharipoda occidentalis</u>	spiny sand crab
	mysids	<u>Acanthomysis davisii</u>	opossum shrimp
tunicates	<u>Doliolum tritonis</u>	salps	
Sandy Intertidal	bivalves	<u>Tivela stultorum</u>	pismo clam
	crabs	<u>Emerita analoga</u>	mole crab
	amphipods	<u>Orchestoidea</u> spp.	sand hoppers
	sea urchins	<u>Dendraster excentricus</u>	sand dollar
	snails	<u>Olivella columellaris</u>	olive snail
Kelp Beds	gastropods	Haliotidae	abalone
	bryozoans	Membranipora	encrusting bryozoan
	tunicates	Ascidiacea	sea squirt
	gastropods	<u>Acmaea</u> spp.	limpet
	sea urchins	<u>Strongylocentrotus purpuratus</u>	purple sea urchin
	gastropods	Tegula	turban snails
	sea snails	<u>Littorina</u> spp.	periwinkles
Rocky Intertidal	sea stars	<u>Asteroidea</u> spp.	starfish
	barnacles	<u>Balanus</u> spp.	acorn barnacles
	bivalves	<u>Mytilus</u> spp.	mussels
	sea anemones	<u>Anthopleura elegantissima</u>	aggregate sea anemone
	sea snails	<u>Tegula funebris</u>	Black Turban snail
	clams	<u>Tresus nutallii</u>	gaper clam
		<u>Macoma secta</u>	white sand clam
Estuary/Slough	clams	<u>Clinocardium nutallii</u>	basket cockle
	worms	<u>Urechis caupo</u>	fat inkeeper worm
		<u>Notomastus tenuis</u>	rubber-band worm
		<u>Neanthes brandti</u>	clam worm
	shrimp	<u>Callinassa californiensis</u>	ghost shrimp
snail		<u>Aplysia californica</u>	sea hare
	crabs	<u>Hemigrapsus oregonensis</u>	mud crab
		<u>Pachygrapsus crassipes</u>	shore crab

1975; Morris et al., 1980). Particularly rich and diverse areas within this class of habitat and encompassed by the Sanctuary study areas include the State designated Areas of Special Biological Significance, as well as Asilomar Beach, the Fitzgerald Marine Reserve and Point Sur. Characteristic species include periwinkles, isopods, barnacles, limpets, sea snails, crabs, chitons, mussels, sea stars, and anemones. Research into the recruitment patterns of crabs and crab bed locations in northern Monterey Bay gives an example of how the distribution of a species can be influenced by local circulation patterns. Temporal tracking of several species of crabs, including the commercially important Dungeness crab, indicates that they are not produced locally but are advected into local waters by the southerly flowing California Current (Monty Graham, pers. comm., 1989).

Invertebrates found in the sandy beach intertidal habitat are dominated by numerous species of polychaete worms, crustaceans, and molluscs. Nearshore benthic invertebrates include polychaetes and other worms; molluscs such as snails and bivalves; ostracods, amphipods, isopods, and other crustaceans; and starfish.

Squid, octopus, jellyfish, salps, heteropods, and euphausiids are some of the macro-invertebrates found in the pelagic environment. Numerous larval invertebrates are also found there during their planktonic stages of development.

Invertebrates found in deep water and the canyon include various species of hexactinellid sponges and gorgonians (soft corals). Nybakken (pers. comm., 1989) has collected specimens of

the clam Calyptogena, which is the same genus as the giant clams of the thermal vent areas of the Galapagos.

Estuarine and slough habitats can support widely diverse and abundant invertebrate species. Historical studies of the Elkhorn Slough area, showed approximately 371 species of benthic invertebrates (excluding oligochaetes) (Nybakken, 1977). The best known inhabitants include clams, such as the gaper, white sand and the basket cockle. In addition worms, shrimp, snails and crabs actively assist in the process of converting the sloughs rich organic matter into food and in the process providing larger organisms such as fish and birds with a plentiful food base.

Invertebrate species harvested by commercial and recreational fishermen include squid, spot prawn, Dungeness crab, abalone, and pismo clam.

5. Fishes

The diversity and abundance of the fish fauna in the Monterey Bay area is a significant resource. Generally, the area exhibits the very rich cold-temperate fish fauna of the Oregonian province (Briggs, 1979). The same environmental factors that determine the distribution, abundance, and species composition of the other living resources of the area also affect the fish communities. In addition to the presence of the submarine canyon and the upwelling of nutrients, kelp beds provide shelter and food for juvenile and adult fish, while offshore rocky reefs are prime feeding and spawning areas for many species of fish (Figure XX).

Approximately 345 species of fish are found within the study

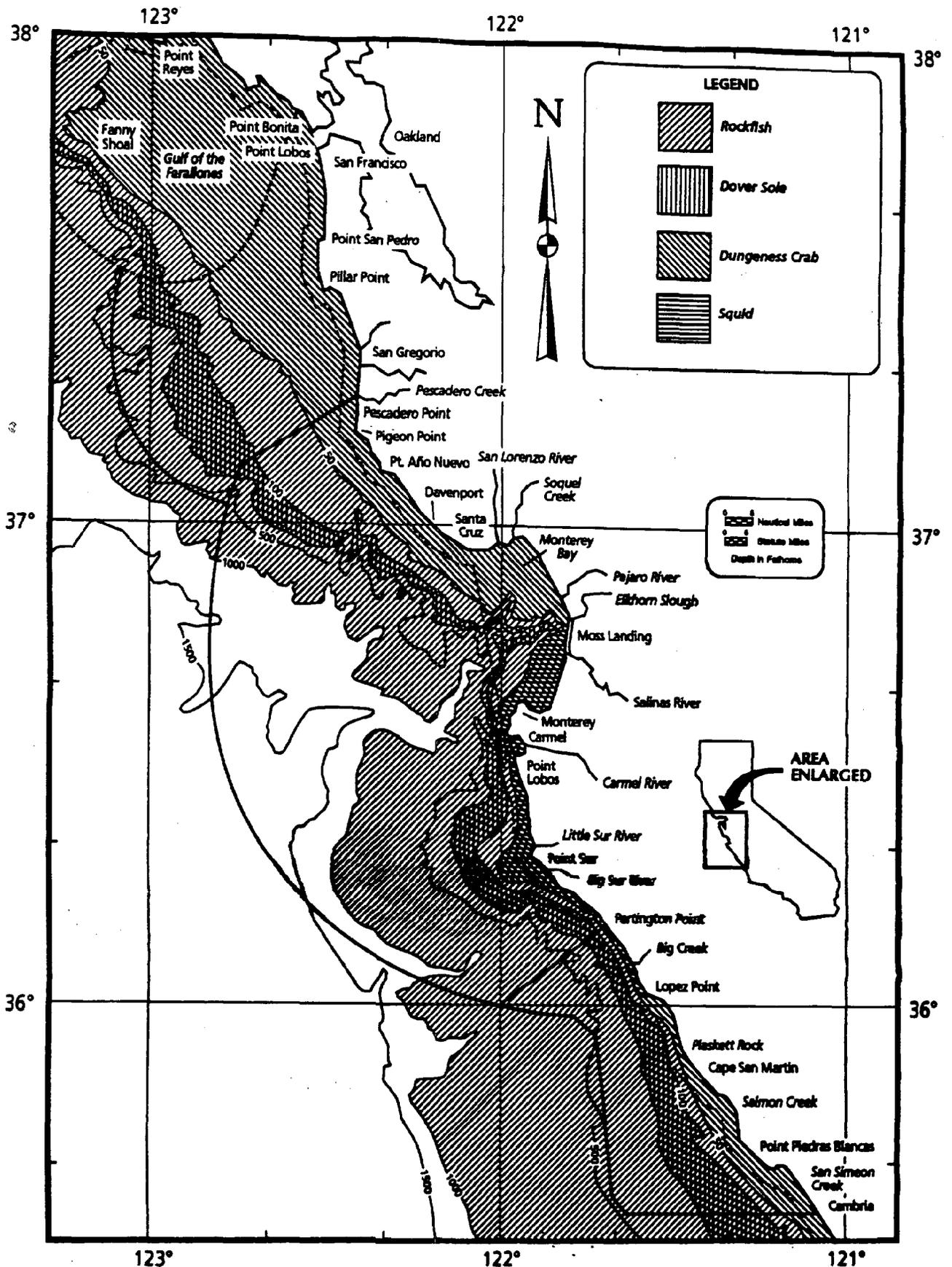


Figure 9. Major Fishery Spawning Areas. Adapted from *Atlas of Marine Resources for Central California* (Central Coast Regional Studies Aug. 1990) and *Ecology of Important Fisheries Species Offshore California* (OCS Study, NMS 86-0093, 1987).

area. The numbers of species most "common" to have been identified and associated with the various habitats include: (1) Canyon and deep bottom, - 93; (2) Rocky intertidal (tidepools), - 24; (4) Subtidal (kelp), - 34; (5) Estuaries, Sloughs and Sandy intertidal - 68; (6) Nearshore sublittoral (soft bottom) - 33; (7) Epipelagic - 25; and (8) Meso- and Bathypelagic - 69 (Greg Cailliet, pers. comm. June, 1991).

The diverse habitats of the area each have their own characteristic assemblage of fish (Table X). Although the fish fauna of Monterey Bay are relatively well known (Kukowski, 1972; Cailliet et al., 1977, in Anderson et al., 1979), fish in the submarine canyon are characterized by a variety of little known meso-and bathypelagic species. Because the canyon allows deep-living species to come close to shore, many uncommon deep-sea fishes have been taken in Monterey Bay. Anderson et al., (1979) reports fishes belonging to 41 families were captured in the bay by Moss Landing Marine Laboratories or by fishermen. Several of the species were previously unrecorded in the area, while others were extremely rare or far beyond their normal range. The persimmon eelpout (Maynea californica) was once thought to be an extremely rare species. It has recently been found to be abundant in the Monterey Canyon in association with its own unique bottom drifting seaweed habitat (Cailliet and Lea, 1977). A rare, deep-water North Pacific frostfish (Benthodesmus elongatus pacificus), a species unknown in California, was caught in Monterey Bay in 1968 (Anderson and Cailliet, 1975). A rare prowfish (Zaprora silenus) was caught

Table 7. Representative Fishes Associated with the Diverse Habitats of the Monterey Bay Area (G. Cailliet, pers. comm., 1989).

<u>Habitat</u>	<u>Common Name</u>	<u>Genus/Species</u>
Submarine Canyon	deep-sea sole	<u>Embassichthys bathybius</u>
	sablefish	<u>Anoplopoma fimbria</u>
	persimmon eelpout	<u>Maynea californica</u>
	Pacific hake	<u>Merluccius productus</u>
	spiny dogfish	<u>Squalus acanthias</u>
Nearshore Sublittoral	Pacific sardine	<u>Sardinops caeruleus</u>
	jack mackerel	<u>Trachurus symmetricus</u>
	California halibut	<u>Paralichthys californicus</u>
	Northern anchovy	<u>Engraulis mordax</u>
	bocaccio	<u>Sebastes paucispinis</u>
Sandy Intertidal	white surfperch	<u>Phanerodon furcatus</u>
	topsmelt	<u>Atherinops affinis</u>
	starry flounder	<u>Platichthys stellatus</u>
	speckled sanddab	<u>Citharichthys stigmaeus</u>
	Pacific sandlance	<u>Ammodytes hexapterus</u>
Kelp Beds	rockfishes	<u>Sebastes</u> spp.
	kelp greenling	<u>Hexagrammos decagrammus</u>
	painted greenling	<u>Oxylebius pictus</u>
	lingcod	<u>Ophiodon elongatus</u>
Rocky Intertidal	tidepool snailfish	<u>Liparis florum</u>
	tidepool sculpin	<u>Oligocottus maculosus</u>
	monkey-face eel	<u>Cebidichthys violaceus</u>
	rockweed gunnel	<u>Xerorpes fucorum</u>
	blackeye goby	<u>Coryphopterus nicholsii</u>
Estuary/Slough	tidewater goby	<u>Eucyclogobius newberryi</u>
	stickleback	<u>Gasterosteus aculeatus leiurus</u>
	Northern anchovy	<u>Engraulis mordax</u>
	Pacific herring	<u>Clupea pallis</u>
	topsmelt/jacksmelt	<u>Atherinopsis</u> spp.
	bat ray	<u>Myliobatis californica</u>
	leopard shark	<u>Trakis semifasciata</u>

on the north shelf of the submarine canyon in 1973 (Cailliet and Anderson, 1975). The commercially important sablefish spawns in the deep waters of the canyon but lives in relatively shallow waters as juveniles (Cailliet and Osada, 1988).

Fish of the nearshore subtidal habitats exhibit the greatest diversity. This habitat includes many commercially important fish such as the pelagic schooling species (northern anchovy, Pacific herring, jack mackerel, sardine), the large predators (king salmon, sablefish, sharks), and some demersal species (English and petrale sole). Many important species of rockfish are found over rocky reefs. Monterey Bay was the southern extent of spawning for the king (chinook) salmon, although they do not presently spawn in any of the Bay's streams.

Sandy intertidal areas are used by small pelagic species (grunion and smelt) that use the beaches of the inner bay for spawning. Other species that forage near sand flats include the surf perch, striped bass, jack smelt, sand sole, sanddab, and starry flounder.

Most of the finfish found in shallow rocky reefs are also common in kelp beds. The kelp canopy, stipes, and holdfasts increase the available habitat for pelagic and demersal species and offer protection to juvenile finfish. Greenling, lingcod, and numerous species of rockfish are the dominant fishes. The rocky intertidal habitat is characterized by a rather small and specialized group of fish adapted for life in tide pools and wash areas. The most representative species are the monkey-face eel,

rock eel, dwarf surfperch, juvenile cabezon, sculpins, and blennies (California Department of Fish and Game, 1979).

Few fishes live year-round in sloughs although some fish such as the tidewater goby Eucyclogobius newberryi and the stickleback Gasterosteus aculeatus leiurus depend upon the more brackish upper reaches of the estuarine habitats. Full time residents such as the staghorn sculpin and the bay pipefish depend upon the mud, eelgrass and other microhabitats to feed, reproduce and hide from predators (Silberstein and Campbell, 1989).

Mid-water swimmers such as the Northern anchovies (Engraulis mordax), Pacific herring (Clupea pallis) and topsmelt and jacksmelt (Atherinopsis spp.) also use the area for feeding while at the same time using the microhabitats for protection from predators (Silberstein and Campbell, 1989).

Large marine predators such as bat rays (Myliobatis californica) and leopard sharks (Trakis semifasciata) forage extensively on the benthic fauna of the more saline lower reaches of the estuaries (Silberstein and Campbell, 1989).

Sardines were the basis for an extensive fishery in the 1930's. Overfishing caused stocks of the Pacific sardine to decrease until the fishery collapsed.

6. Seabirds

The Monterey Bay area historically has been recognized as a uniquely important region of seabird occurrence (Loomis 1895, 1896; Beck 1910). Several environmental features are responsible for the diverse assemblage of birds in the area:

the bay is located on the Pacific Flyway, allowing the birds a place to stopover during both north and south migrations between southern wintering grounds and northern breeding sites.

- ° the upwelling of nutrient-rich waters adjacent to the submarine canyon support highly productive food webs which provide abundant seabird prey.
- ° plumes of upwelling in the outer shelf regions also act to concentrate prey near the surface in "fronts" at the plume edges (Briggs et al., 1983a, 1984, 1987a, b; Briggs and Chu, 1986, 1987).
- ° the availability of food in a bay protected on three sides allows birds that normally feed far offshore to seek shelter during storms.
- ° the diversity of habitat types along the shore increases the variety of bird species which utilize the bay area.

Ninety-four seabird species are known to occur in the Monterey Bay region, of which about thirty species predominate in their preferred seasons and habitats (Briggs and Chu, 1987). **Table X** lists some important seabirds and their seasonal status. Thirteen species are resident breeders or former breeders within the region. Common breeding species include Brandt's cormorants, western gulls, pigeon guillemots, and common murres (Dohl, 1983). The location of important seabird colonies are shown in **Figure X**.

The majority of seabirds occur here as non-breeding residents/visitors and spring/autumn migrants. The area is important habitat for visiting autumn and winter populations of ashy storm-petrels, California brown pelicans, sooty and short-tailed shearwaters, western grebes, common murres, marbled murrelets, Cassin's and rhinoceros auklets, surf scoters, and several species of gulls. Spring and fall migrant species include phalaropes, Pacific loons, common and arctic terns, and pomarine

Table 4. Representative Seabirds and their Seasonal Status in the Monterey Bay Area (from Briggs, et al., 1983).

Breeding Species

Double-crested cormorant
Brandt's cormorant
Pelagic cormorant
Western gull
Caspian tern
Tufted puffin
Snowy Plovers

Forster's tern
Common murre
Pigeon guillemot
Marbled murrelet (Threatened)
Rhinoceros auklet
Brown pelican (until 1959)

Winter resident/visitors

Common loon
Arctic loon
Western grebe
Red-necked grebe
Laysan albatross
Northern fulmar

Black scoter
Surf scoter
Harlequin duck
Herring gull
Glaucous gull
Black-legged kittiwake

Spring/autumn migrants

Flesh-footed shearwater
Mottled petrel
Brant
Red phalarope
Horned puffin
Pomarine jaeger

Long-tailed jaeger
South Polar skua
Laughing gull
Sabine's gull
Arctic tern
Common tern

Summer/autumn (nonbreeding) residents/visitors

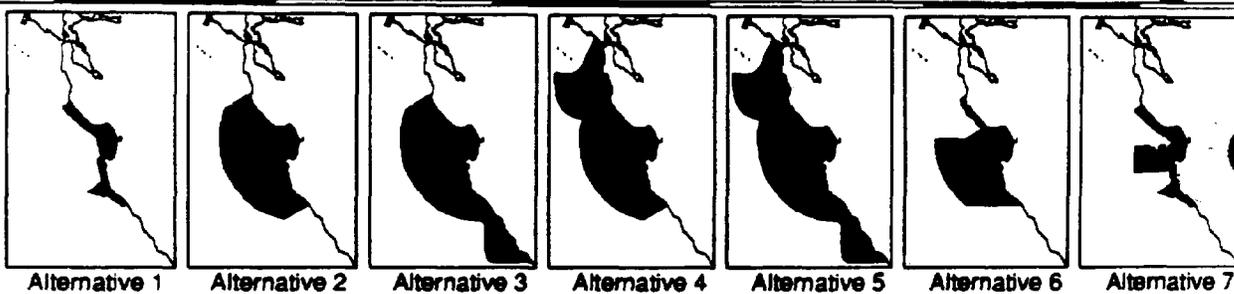
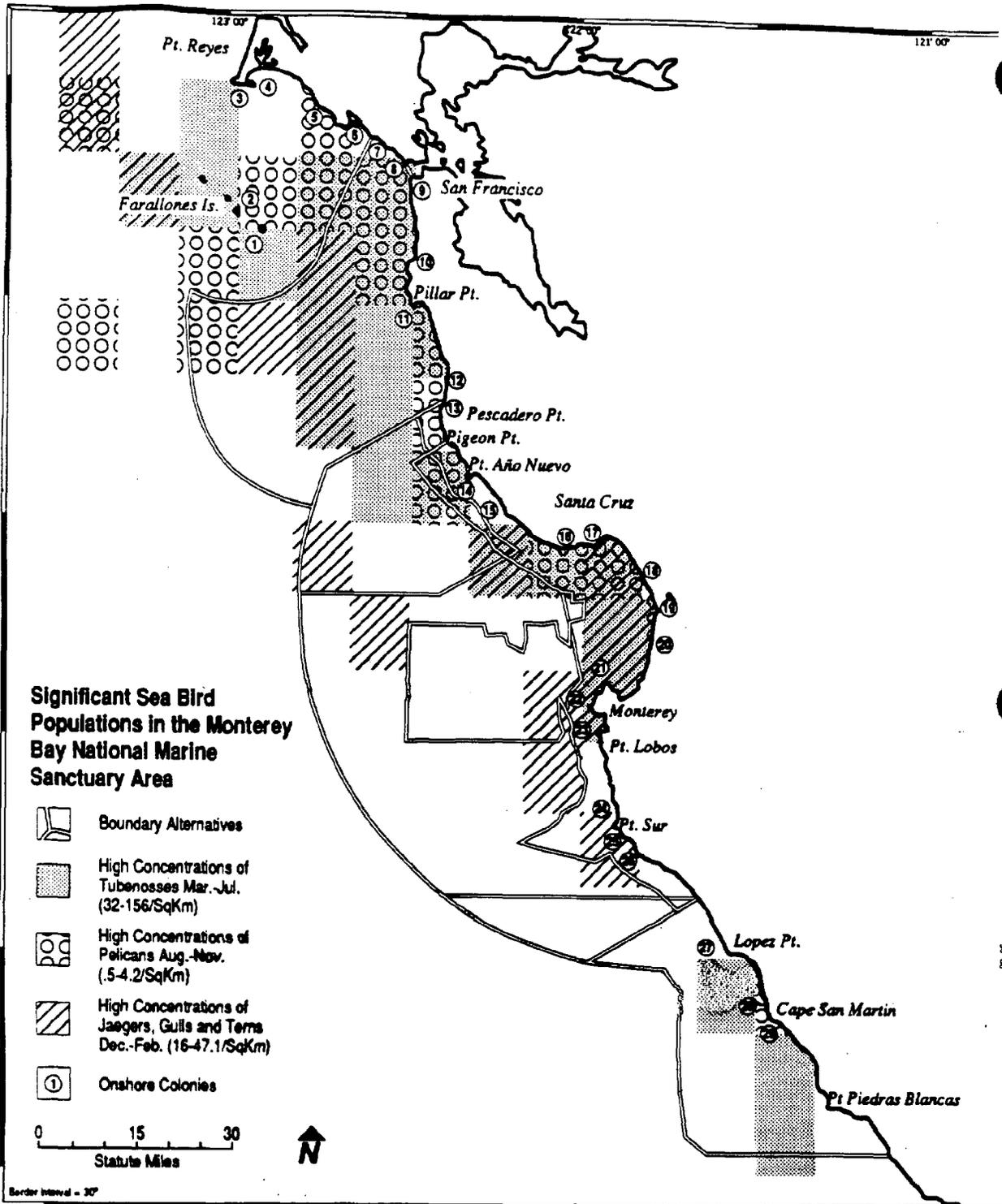
Buller's shearwater
Black-footed albatross
Pink-footed shearwater
Sooty shearwater
Black-vented shearwater

Black storm-petrel
Royal tern
Elegant tern
Xantus' murrelet
Ashy storm-petrel

Rarities

Yellow-billed loon
Short-tailed albatross
Cape petrel
Greater shearwater
Least storm-petrel
Red-billed tropicbird

Brown booby
King eider
Black tern
Thick-billed murre
Black skimmer
Little gull



and parasitic jaegers. Four species of endangered birds are found in the area: the short-tailed albatross, the California brown pelican, the American peregrine falcon, and the California least tern. One species, the western snowy plover, is a candidate species for being listed as endangered or threatened by the U.S. Department of the Interior. The California brown pelican nested at Point Lobos until 1959 (Baldrige, 1974). The brown pelican now breeds during the summer in southern waters and migrate into the area in large numbers in September and October. They currently roost on Año Nuevo Island, Elkhorn Slough, and Point Lobos. The California least tern nested at Moss Landing early in the century. In 1973, the coast south of San Francisco contained only 20 colonies with a total of fewer than 700 pairs (Udvardy, 1977). Peregrine falcons feed along the shores of the bay, especially around Point Lobos and Elkhorn Slough. Five nests have been identified in Big Sur (Roberson, 1985).

Offshore distributions and concentrations of seabirds show the importance of the Monterey Bay area marine ecosystem as a habitat for seabirds (Figure XX and XX).

There are a total of 94 species of seabirds which can be found in 23 main rookeries and colonies in the Monterey Bay area. Figure X, taken from Chabot and associates (1990), shows the areas of high concentration for significant populations of seabirds in the study area. It also shows a total of 23 rookeries and colonies within the study area. Significant populations include pelicans, tubenoses, jaegers, gulls and terns. The highest concentrations

are found in the northern portion of the study area.

Ashy storm-petrel populations currently number less than 10,000 birds. About 85% of them breed on the Farallon Islands. Almost all of them come to Monterey Bay to feed over the submarine canyon during the summer and fall (Roberson, 1985).

Additional facts about several species further indicate the importance of the Monterey Bay area to seabirds. The southernmost relic population of the severely threatened marbled murrelet occupies several isolated sites in the Santa Cruz Mountains. Año Nuevo Island was recently colonized by rhinoceros auklets (their southernmost confirmed nesting site) and contains the largest colony of western gulls in the region (Lewis and Tyler, 1987). The seacliffs of Santa Cruz and Monterey counties support more nesting pigeon guillemots than the Farallon Islands, which has the largest single colony in California.

During spring migration, large numbers of shorebirds gather on the beaches. Common migrant shorebirds include sandpipers, turnstones, plovers, sanderlings, willets, and godwits. Many of these species also winter in the area in large numbers. Elkhorn Slough seasonally harbors over 30,000 shorebirds during migrations (Stenzel et al., MS). Nearly a fifth of California's breeding population of snowy plovers nest on the beaches in the area and this species is especially common in the vicinity of Pescadero Marsh. In addition to being a candidate species for the endangered or threatened list, the plover is also a Species of Special Concern in California (Remsen, 1978).

Sea ducks and geese use the coves along the bay for staging during spring migration. Año Nuevo Bay is an important wintering site for Harlequin ducks (a species of Special Concern) and brant.

7. Turtles

Four species of sea turtles are found in the study area. The Leatherback (*Dermochelip coriacea*) is the most common followed by the Green (or Black) turtle (*Chelonia mydas agassizi*), the Loggerhead turtle (*Caretta caretta*) and an occasional Olive Ridley (*Lepidochelip olivaceas*). There are no sea turtle nesting areas in the study area. They are mostly seen during their foraging activities in the summer and early fall. Most appear during the warmest sea temperatures (above 16 degrees C and most common above 18 degrees C). Many of the turtles distributions seem to be regulated by the 16 degree C isotherm (Pers. comm., Scott Eckert, NOAA/NMFS, 1991).

8. Marine Mammals

Twenty-six species of marine mammals have been observed in the Monterey Bay area, including five species of the sub-order pinnipeds (seals and sea lions), one species from the sub-order fissipeds (the sea otter), and twenty species of the order cetaceans (whales and dolphins) (Table X). Representatives of the order and each sub-orders in the Monterey Bay area are described further below.

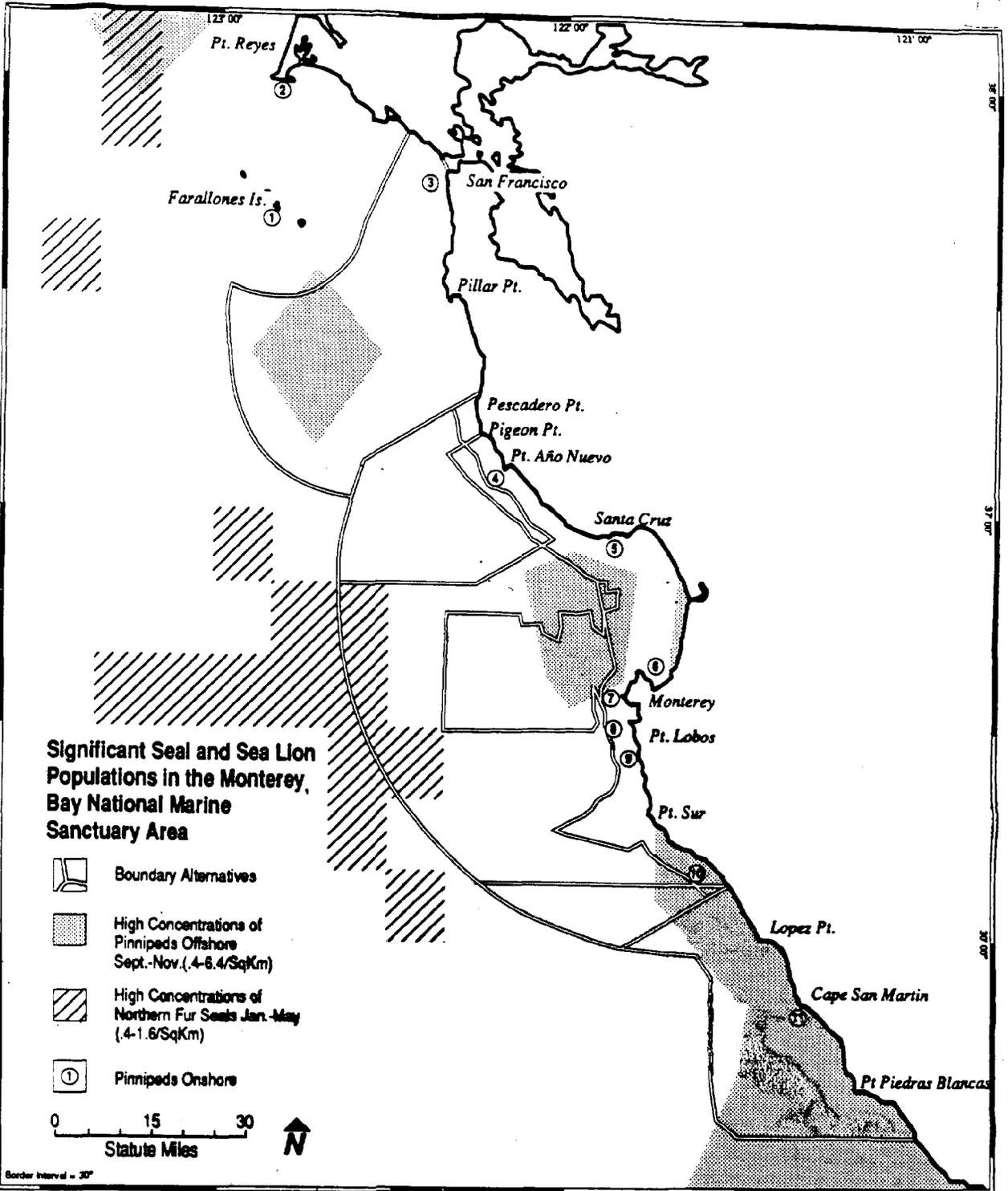
a. Pinnipeds

Figure XX shows the principal pinniped breeding and haulout areas and offshore concentrations. There are a total of 9

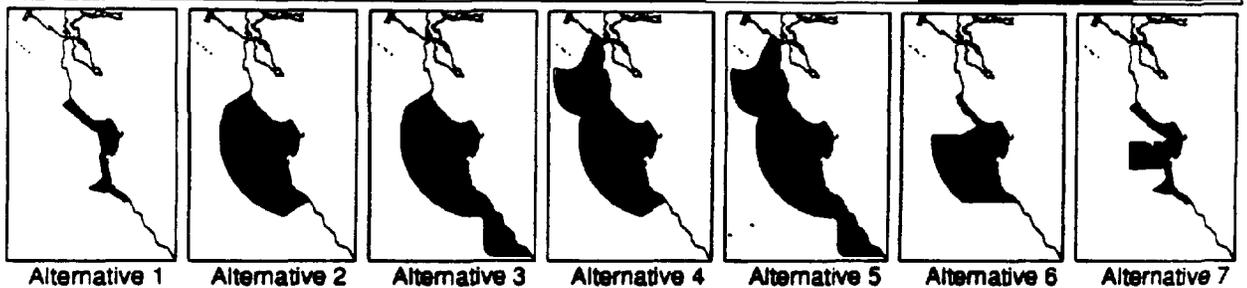
Table 5. Marine mammals found in the Monterey Bay area. Status abbreviations: SR - seasonal resident, YR - year-round resident, ST - seasonal transient (A. Baldrige, pers. comm., in Heimlich-Boran, 1988)

<u>Common Name</u>	<u>Genus/Species</u>	<u>Status</u>
PINNIPEDS:		
California sea lion	<u>Zalophus californianus</u>	SR
Steller sea lion*	<u>Eumatopias jubatus</u>	SR
Northern elephant seal	<u>Mirounga angustirostris</u>	SR
Northern fur seal	<u>Callorhinus ursinus</u>	ST
Guadelope fur seal **	<u>Arctocephalus townsendi</u>	ST
Harbor seal	<u>Phoca vitulina</u>	YR
FISSIPED:		
Southern sea otter *	<u>Enhydra lutris</u>	YR
CETACEANS:		
California gray whale **	<u>Eschrichtius robustus</u>	ST
Blue whale **	<u>Balaenoptera musculus</u>	ST
Fin whale **	<u>Balaenoptera physalus</u>	ST
Minke whale	<u>Balaenoptera acutorostrata</u>	SR
Humpback whale **	<u>Megaptera novaengliae</u>	ST
Pacific right whale **	<u>Eubalaena glacialis</u>	ST
Sperm whale **	<u>Physeter catadon</u>	ST
Pygmy sperm whale	<u>Kogia breviceps</u>	ST
Baird's beaked whale	<u>Berardius bairdi</u>	ST
Cuvier's beaked whale	<u>Ziphius cavirostris</u>	ST
Short-finned pilot whale	<u>Globicephala macrorhynchus</u>	ST
Killer whale	<u>Orcinus orca</u>	ST
False killer whale	<u>Pseudorca crassidens</u>	ST
Risso's dolphin	<u>Grampus griseus</u>	SR
Pacific white-sided dolphin	<u>Lagenorhynchus obliquidens</u>	SR
Northern right whale dolphin	<u>Lissodelphis borealis</u>	SR
Dall's porpoise	<u>Phocoenoides dalli</u>	SR
Harbor porpoise	<u>Phocoena phocoena</u>	SR
Bottlenose dolphin	<u>Tursiops truncatus</u>	ST
Common dolphin	<u>Delphinus delphis</u>	ST

** Endangered * Threatened



Graphics by Tyler Johnson, Central Coast Regional Studies Program



rookeries/ colonies in the study area. The areas of concentration and principal rookeries/ colonies here estimated from **Figure XX** provided by Chabot and Associates (1991). The highest areas of concentration are within the southern portion of the study area (encompassed by boundary alternative 3). Most of the rookeries/colonies are within the central portion of the study area (boundary #2).

The five species of pinnipeds considered common in the Monterey Bay area include California sea lions, Steller sea lions, Northern elephant seals, Northern fur seals, and Pacific harbor seals. An additional species, the Guadalupe fur seal, has been reported from records of sick animals stranded on the beach. One juvenile male was found along the shore near Fort Ord in April 1977 (Webber and Roletto, 1987). Año Nuevo is the most important pinniped breeding site in the area and is the most important pinniped rookery and resting area in central and northern California.

In any season, California sea lions are the most abundant pinniped in the area (Bonnell et al., 1983). They breed farther south along the coast in the summer, then migrate northward, reaching their greatest numbers in the Monterey Bay area in autumn. Sea lions haul out on offshore rocks and islands. The greatest numbers occur on Año Nuevo Island, with the fall population reaching more than 7,000 animals. Both the haul-out sites and the foraging grounds are essential to the health of the species. Other popular haul-out sites include the offshore rocks of the outer

coast between the Monterey Peninsula and Point Sur, and the long breakwater of Monterey Harbor.

Although Año Nuevo Island has the largest breeding population of Steller (northern) sea lions south of Alaska (Loughlin et al., 1984), the numbers of this species have been declining throughout their range over the last 30-year period. Due to this rapid decline in the species NOAA published on 5 April, 1990 an emergency rule listing the Stellar sea lion as threatened to be followed by a permanent ruling. These sea lions presently breed almost exclusively on offshore rocks to the northwest of Año Nuevo Island. The latest aerial survey (in the summer of 1985) showed the population to be 1,169 animals, including 328 pups (Bonnell and Le Boeuf, unpubl. data). The population declined to a low during the 1983 ocean temperature anomaly (El Niño), but recovered to pre-El Niño levels in 1984 and 1985. NOAA will be developing a "recovery plan" for this species with special attention to rookery areas such as Año Nuevo.

Northern elephant seals breed in the winter months and then disperse to feed in pelagic waters throughout the eastern North Pacific. A portion of the population returns to the colony later in the year to undergo an annual molt. Peak abundances occur on land in the spring when juvenile males and females haulout to molt. The largest populations are on Año Nuevo Island and the adjacent mainland point. The breeding population at these locations presently numbers about 3,500 animals (Le Boeuf, unpubl. data). The spring population on land exceeds 4,000 animals. Estimates

based on population structure indicate that elephant seals of the Año Nuevo colony account for about 4% of the entire world population of this species (M.L. Bonnell, pers. comm., 1989).

Pacific harbor seals are year-round residents in the area. They haul out at dozens of sites along the coast from Point Sur to Año Nuevo. Peak abundance on land is reached in late spring and early summer when they haul out to breed, give birth to pups, and molt. More than 1,800 animals were counted on land in this area during a survey in 1982. This represents more than 11% of the entire state population (Bonnell, et al., 1983). A summer of 1986 census counted 1,364 seals on only 38 of the 72 known haul out sites in the area (Hanon, et al., 1987). Favorite haul out sites are isolated sandy beaches and rocky reef areas exposed at low tide. Harbor seals also use the estuarine habitat of Elkhorn Slough. A recent census of harbor seals at Elkhorn Slough shows the mid-august population increasing from 40 in 1986 to 120 in 1990 (Elkhorn Slough NERR, monitoring data, 1990).

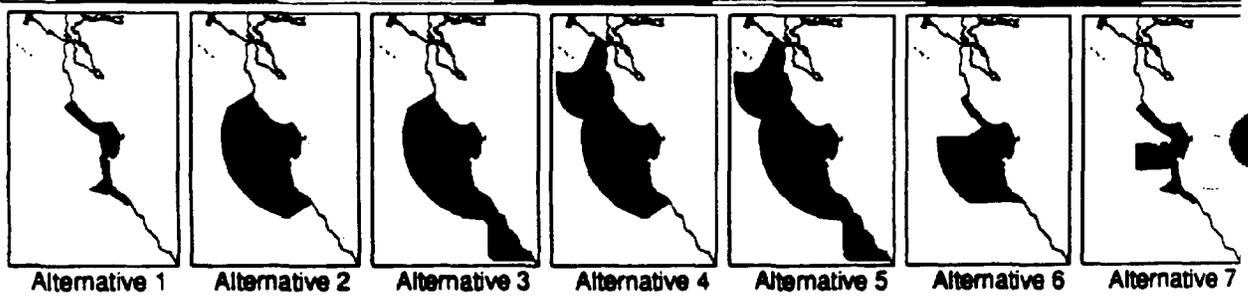
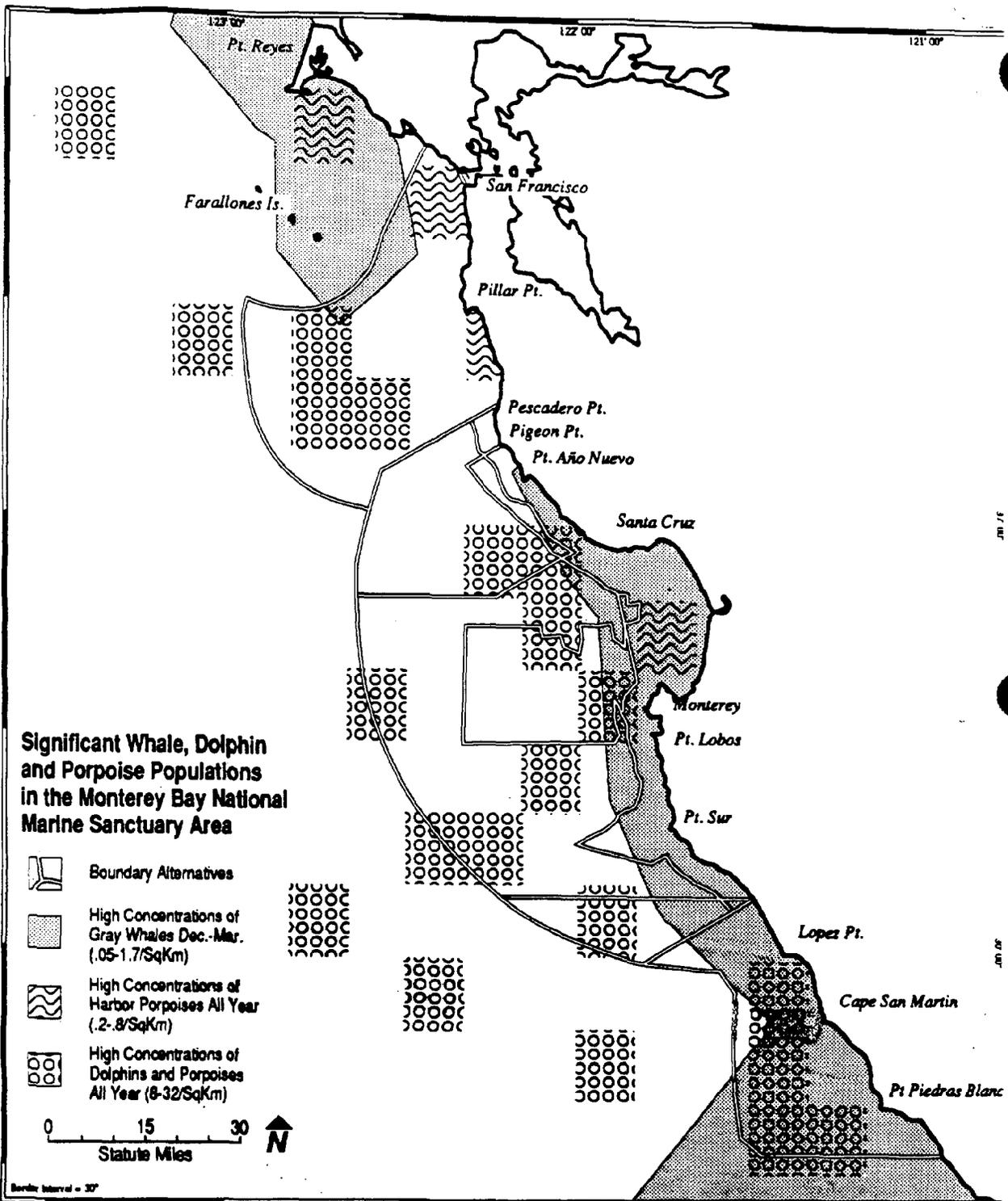
Northern fur seals occur in the open waters over the Monterey Canyon in winter and spring. They feed offshore after migrating from the Pribilof Islands. The greatest density of animals are found well offshore over the continental slope in waters from 100 to 1,000 fathoms (200 to 2,000 m) depth. Northern fur seals rarely haul out on land, although they are occasionally seen on Año Nuevo Island. They have a declining population presently estimated at 1.2 million animals. This species has been proposed for designation as a depleted species by the NOAA.

b. Cetaceans

Of the twenty species of cetaceans seen in the Monterey Bay area (Table X), about one-third occur with frequency. Six of the whales are listed as endangered species: the blue, fin, humpback, gray, right, and sperm. Figure XX taken from Chabot and Associates, (1991), shows the areas of high concentration for grey whales, porpoises and dolphins. Other cetaceans such as humpback whales, right whales, minke whales, fin whales, blue whales and killer whales also seasonally inhabit the waters within the study area. The highest concentration areas of cetaceans are within the southern and central portions of the study area.

Gray whales are seasonal migrants (Figure 13). They travel close to shore and are the object of most of the whale watching in the area. They pass through the area twice on their yearly migration from Alaska to Baja California where they breed and then return. Reilly (1984) estimated the 1980 population of gray whales to be 15,000 animals.

Blue whales have significantly increased in numbers within and adjacent to Monterey Bay. Once considered only a summer visitor of limited numbers, blue whales have become a major constituent of the cetacean fauna from late spring until late autumn or early winter. Over 40 animals were counted in one day in Monterey Bay in the summer of 1986 (T. Dohl, pers. comm., 1989). Less than 2,000 blue whales exist in the eastern north Pacific (Haley, 1987). They migrate from northern feeding areas to waters off Baja California and Central America in the fall.



Minke whales are one of the largest whales that feed close to shore within Monterey Bay. Up to 12 animals are regularly seen in the southern bight of the bay and south to Point Sur during summer (A. Baldrige, pers. comm., in Heimlich-Boran, 1988).

Fin whales have increased in numbers and length of stay in the area in recent years. This species utilizes the Monterey, Soquel, and Carmel canyons for feeding. They are found in greatest numbers at the heads of each of these canyons in depths of 200 m to 2000 m (T. Dohl, pers. comm. 1989).

Humpback whales are often seen in nearshore waters from 100 m to 200 m depth. Although still an endangered species, their numbers have increased dramatically throughout central California beginning in the early 1980's. At first limited to the general area of the Farallon basin, they are now found in coastal waters from Point Sur to Pillar Point from late-April to mid-December.

The Pacific Right whale is an extremely endangered species. Fewer than 200 individuals may inhabit the entire North Pacific (Braham and Rice, 1984). Little is known about this species; its breeding areas are unknown but presumed to be on their wintering grounds in warmer waters. No right whales have been seen in Monterey Bay, but they were seen in 1986 and 1987 in the waters off of Half Moon Bay, north of Año Nuevo (Scarff, 1987).

Sperm whales are occasionally seen offshore at the mouth of the Monterey Canyon. Pilot whales, false killer whales, and two species of rare beaked whales have also been sighted.

Killer whales have been seen throughout the bay, occasionally

attacking gray whales (Baldrige, 1972).

Two species of porpoise are commonly found in the bay: Dall's porpoise and the harbor porpoise. The harbor porpoise is usually found over sandy bottoms just off the surf in the north central part of the bay. Dall's porpoise is seen frequently along the edge of the canyon.

Pacific white-sided dolphins, northern right whale dolphins, and Risso's dolphins are the most numerous cetaceans in the area. All three species will often travel together in a school.

Bottlenose dolphins are found in small numbers (12-18) within the bay seemingly on a year-round basis. Common dolphins are found all year, sometimes in schools of 400-600 animals. This species is normally considered a warm water animal and was once thought to extend north only to Point Conception. Both dolphin species have increased in numbers in recent years (T. Dohl, pers. comm., 1989).

c. Fissipeds

There are approximately 1,241 individual sea otters within the study area (Chabot and Associates, 1990). The range of the sea otters within the study area is approximately 130 square nautical miles (Figure XX). Since the southern portion of the study area includes the California Sea Otter Game Refuge, Boundary Alternatives 3 and 5 contain the most number of individuals and the greatest range within the study area.

The California or southern sea otter is a threatened species that is found throughout the shallow waters of Monterey Bay from Pismo Beach to Año Nuevo Island. Sea otters inhabit a narrow zone

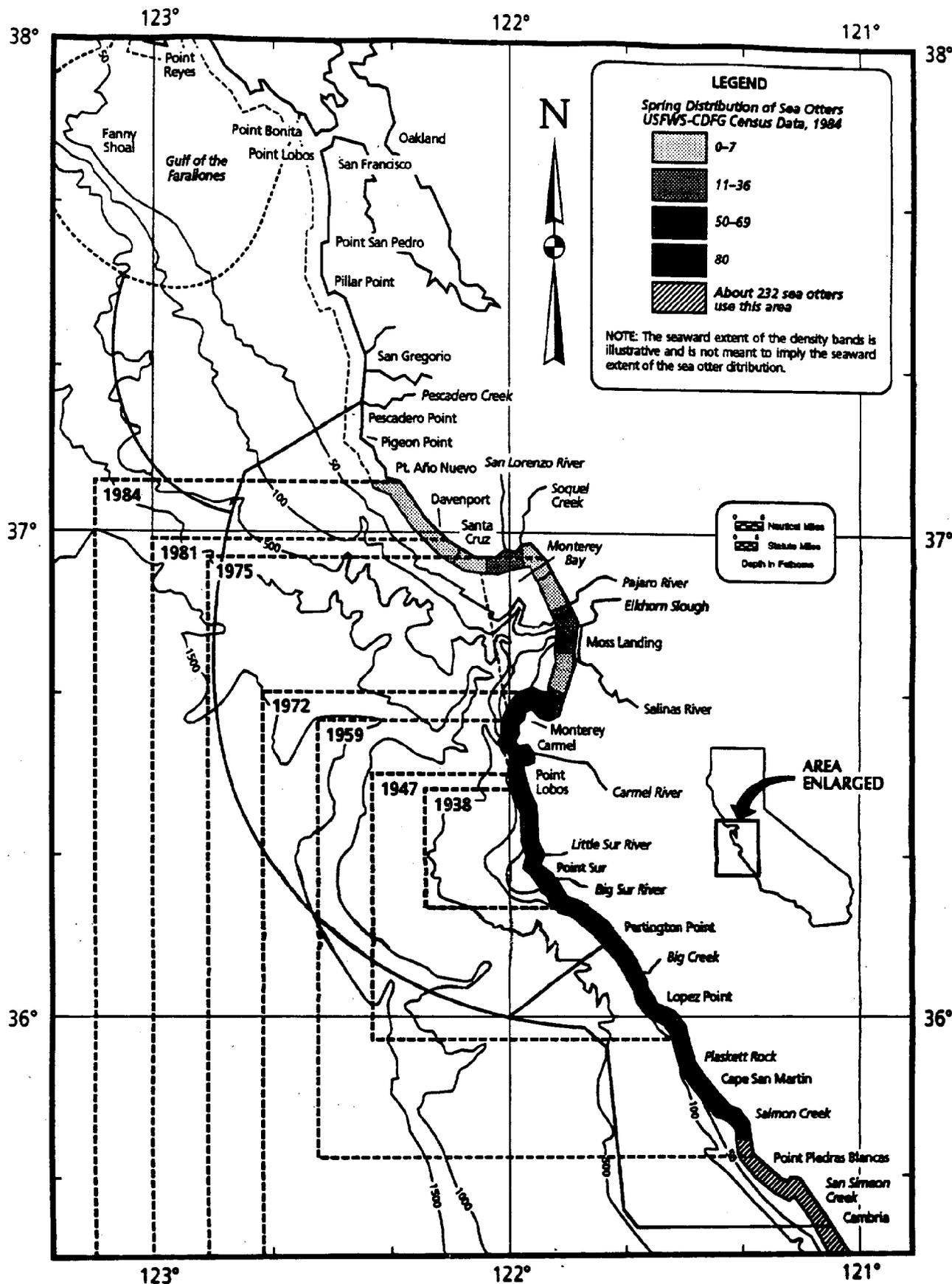


Figure 13. California Sea Otter Rate of Range Expansion and Distribution. Rate of Expansion (1914-1984) (Reidman, 1986) Spring Distribution of Sea Otters USFWS-CDFG Census Data, 1984, as provided by Chabot and Assoc.

of coastal waters, normally staying within about one mile from shore. They forage in both rocky and soft-sediment communities as well as in the kelp understory and canopy. They seldom are found in open waters deeper than 30 m, preferring instead the kelp beds which serve as vital resting, foraging, and nursery sites. Otters are an important part of the marine ecosystem. By foraging on kelp-eating macroinvertebrates (especially sea urchins) sea otters can, in many instances, influence the abundance and species composition of kelp assemblages and animals within nearshore communities (Riedman, 1987).

The California sea otter population is a remnant of the North Pacific population that was decimated by the commercial fur trade in the 18th and 19th centuries. In 1914, this population in California occupied a few miles of the rocky Point Sur coast and was estimated to contain about 50 otters. By 1938, when the public became aware of these remnant otters, the total California population was between 100-300 animals. Between 1938 and 1976 the population increased at about 5 percent per year. From 1976 until the early 1980's, the population did not grow at all, mainly because of the number of otters drowning from entanglement in fishing nets. Since state legislation restricted the use of entangling nets, spring population counts may be increasing at about 8 percent per year (in Saunders, 1989). However, this population growth rate is still much lower than the growth rates of sea otter populations in the Aleutian Islands. In addition to the entanglement in fishing nets, other possible factors for the low

population growth include illegal shooting, white shark attacks, pathological disorders, contamination from degraded water quality, starvation, and adverse weather conditions. The most recent census (1988) indicates a total population of fewer than 1800 animals (Saunders, 1989). Approximately 31 percent of this population is currently found in the area from Point Sur north to Año Nuevo/Pigeon Point. **Figure 14** shows the rate of sea otter range expansion from 1914 to 1984. An official state-designated Sea Otter Game Refuge extends from Carmel south to Santa Rosa Creek near Cambria, encompassing about half the otter's established range.

E. Cultural and Historical Resources

Cultural and historical resources are prehistoric and historic remains comprising a non-renewable resource base that provides anthropologists and historians with information for reconstruction of past cultural systems and behaviors (BLM, 1980). Historical and cultural resources are defined as those areas of the marine environment possessing historical, cultural, archeological or paleontological significance, including sites, structures, districts, and objects significantly associated with or representative of earlier people, cultures, and human activities and events. Historical and cultural resources in the marine environment may generally be categorized into (a) prehistoric remains, (b) inundated cities, harbors, and shore installations, and (c) shipwrecks.

1. Historic sites

The coastal lands of central California contain numerous archaeological sites, most of which represent Native American resources. There are approximately 718 reported and verified historic sites in the Sanctuary study area and adjacent coastal zone (MMS, 1990). Recent geologic history has produced a number of geomorphic changes in the Monterey Bay area as a result of sea level change, tectonics and changing erosion and sedimentation rates and as a result there may be many additional undiscovered inundated historic and aboriginal sites within the proposed Sanctuary.

The gap in our understanding of the full historical

significance of these resources presents an exciting and fertile area for additional research into the history of Monterey Bay.

Archaeological evidence suggests that the earliest human occupancy of coastal California began well over 10,000 years ago with immigrants who were primarily hunters. About 7,500 years ago the people became dependent on shoreline resources and seed gathering (Meighan, 1965, in Gordon, 1977). More recently, the Monterey Bay area is within the former territory of the Costanoan Indians. The Costanoan economy was a continuation of the dependence of previous cultures on the shoreline resources. Old habitation sites can be located today by kitchen midden deposits (also called shellmounds) which accumulated in the villages. Many of these deposits on the coast are found in sand dunes. More than a dozen shellmounds are located on the dunes at Año Nuevo Point and to the further south shellmounds are found above the rocky shoreline of the Monterey Peninsula.

According to BLM (1979) significant historic sites exist throughout the study area especially at urban centers such as San Francisco, Santa Cruz, Monterey and Carmel. National Register Historic Sites exist at San Simeon Estate, and at Half Moon Bay. Piedra Blancas, Fort Point and Point Montara Lights are classified as Historic Lighthouses; and Point Pinos and Pigeon Point Lights are classified as both National and California Historic Lighthouse Sites. Point Sur and Point Bonita Lights are classified as California Historic Sites.

2. Shipwrecks

Offshore cultural and historical resources include sunken ships and aircraft. An in-house study conducted by the BLM in 1979 to compile and organize available shipwrecks data identified 1,276 vessels of historic interest that were reported lost along the central and northern coast of California.

Recently on June 24, 1990, a research submersible SEACLIFF discovered the wreck of the airship MACON and two of its Grumman Sparrowhawk fighters in approximately 1,500 feet of water off Point Sur. Much attention and research has been focused on the MACON in attempts to learn more about the wreck and determine the feasibility of raising parts or all of the airship and its planes. Within the entire study area there have been identified but unconfirmed reports of approximately 311 additional shipwrecks (MMS, 1990).

The California State Lands Commission (SLC) has a computer inventory of all sites identified within the Sanctuary study area. The SLC has an agreement with the University of California at Berkeley to provide further research on these sites and vessels to determine their historic significance (Peter Pelkofer, pers. comm. 1990). The SLC in association with the State Historic Preservation Officer nominates appropriate sites and vessels for listing on the Register.

F. Existing Protected Areas

Within the entire study area there are approximately 36 existing protected areas of coastline and adjacent marine habitat

that are managed by the State of California Department of Fish and Game or Parks and Recreation (Table X). In addition to state areas, the National Park Service manages the Golden Gate National Recreation Area (at the northern end of the study area) and the National Forest Service manages the Los Padres Forest (at the southern end of the study area).

All of these state protected areas are designated by the State with the intent to protect significant local resources for either research, education or aesthetic purposes (Table XX) (Also see Recreation and Tourist, and Research and Education sections below). A brief discussion on the types of, and management regime for, the protected areas follows:

1. State Refuges and Reserves

Several refuges and reserves for the protection of marine life have been established in the proposed sanctuary area by the California Department of Fish and Game. These areas fall into five general categories and relate to the type of resource and its specific protection needs; a) ecological reserves, b) game refuges, c) marine life refuges, d) fish refuges, and e) marine reserves. The general authority exercised by the Department of Fish and Game within each category and within specific refuges or reserves in the study area is as follows:

a. Ecological Reserves (California Fish and Game Code § 1580 et. seq.)

Of the categories of refuges and reserves administered by the

98

Table 12. Restrictions on the recreational taking of invertebrates in tide pools or other areas between the high tide mark (California 14 Administrative Code §29.05).

abalones, chitons, clams cockles, crabs, lobsters, scallops, sea urchins, and worms	--must have written permit from DFG to take in State marine life refuges and other special closures
ghost shrimp	--must have written permit from DFG to take anywhere <u>other than in</u> State parks, underwater parks, and national monuments and seashores
limpets, mussels, sand dollars, octopi, shrimp, sea urchins, turban snails, and squid	--must have written permit from DFG to take in State marine life refuges, parks, beaches, recrea- tion areas, underwater parks, and national monument and seashores.

Department of Fish and Game, ecological reserves provide the most comprehensive protection. Within these ecological reserves, the California Department of Fish and Game has the authority to prohibit any activity which may harm the resources, including: fishing, collecting, swimming, boating, low-flying aircraft, and public entry (14 California Administrative Code § 630 (a)). General regulations provide that "no person shall disturb geological reserves, formations or archaeological artifacts or take or disturb any bird or nest, or eggs thereof, or any plant, mammal, fish, mollusk, crustacean...or any other form of plant or animal life in an ecological reserve" (14 California Administrative Code §630(a)(1)). These prohibited activities may, however, be permitted by the Department of Fish and Game in particular reserves or in certain areas of particular concern pursuant to specific regulations.

For example the Point Lobos Ecological Reserve includes Point Lobos and adjacent ocean waters. Both Point Lobos and Carmel Bay are protected due to the fragility of the prevalent rocky tidepools. The areas are also heavily used by marine mammals and birds. Point Lobos is a favored roosting area for the endangered Brown Pelican (Association of Monterey Bay Area Governments, 1978).

Efforts to protect the resources of Point Lobos reserves, including 750 acres (300 hectares) of underwater area, have been initiated by the California Department of Parks and Recreation (DPR). Because DPR lacks authority to prohibit fishing, however, the area was established as an ecological reserve rather than park.

The reserve is managed primarily by DPR, which maintains a large, on-site staff, with DFG contributing as needed to enforcement efforts. All fishing is prohibited within the reserve. Swimming, boating and other aquatic sports are permitted. Boats, however, may be launched and retrieved only in designated areas and may be anchored only during daylight hours.

For another example the Carmel Bay Ecological Reserve encompasses ocean waters of Carmel Bay extending approximately .75 sm (1.4 km) from the mean tide line to a line drawn across the bay from Granite Point to Pescadero Point. The reserve also includes the Pinnacles, a series of offshore rocks, and surrounding ocean waters less than 15 fathoms (28.3 meters) in depth. Carmel Bay marks the beginning of the California Sea Otter Refuge. The Bay is an important haulout and foraging area for otters and other marine mammals. The nearshore zone is typical kelp forest habitat, with the attendant abundance of marine life (Association of Monterey Bay Area Governments, 1978). While the DFG is primarily responsible for managing the reserve, DPR enforcement personnel from Point Lobos Ecological Reserve patrol the Bay.

Sport fishing with hook and line, spear gun, or hand-held implements is generally permitted within the reserve. No invertebrates may be taken, however. Swimming, boating, surfing, skin, and scuba diving are all permitted. Extensive restrictions apply to the harvesting of kelp. If, at any time, the DFG Director finds that the harvesting of kelp will tend to destroy or impair kelp beds, or tend to destroy or impair the supply of food for fish

or wildlife, a notice that a particular kelp bed, or part of a bed, will be closed to the harvesting of kelp for period not to exceed one year, must be issued. At least 48 hours notice of the intention to harvest kelp within the reserve must be given the CDFG's regional manager. An observer of the CDFG may accompany the harvester. Other regulations apply to the harvesting of kelp on particular areas of the reserve.

b. Game Refuges (California Fish and Game Code § 10500 et seq.)

It is unlawful in general to take or possess any bird or mammal or part thereof, in any game refuge [California Fish and Game Code § 10500]. In addition, the use or possession of any firearm, bow and arrow, or any trap or other contrivance designed to be or capable of being used to take birds or mammals is prohibited within a game refuge (California Fish and Game Code §10500). The Department of Fish and Game has complete authority to exercise control over all mammals other than marine mammals and birds in any game refuge, including the authority to issue permits for their taking (California Fish and Game Code §10502). In navigable water areas of game refuges, however, general regulations do not prohibit the taking of birds or mammals.

For example, the California Sea Otter Game Refuge covers portions of Monterey and San Luis Obispo Counties between the Carmel River on the north and the Santa Rosa Creek on the south, which lie west of California Highway No. 1 (California Fish and Game Code §10840). The refuge excludes coastal waters. It is the

largest refuge in the state covering 86 nm (160 km) of coastline in Monterey County and 30 nm (56 km) in San Luis Obispo County (Association of Monterey Bay Area Governments, 1978). Within its boundaries are several state parks and reserves, including Point Lobos Ecological Reserve and the Julia Pfeiffer Burns State Park, and the entire Big Sur coastline.

The refuge was primarily created to protect the threatened California Sea Otter, but it also protects important habitat for numerous marine birds and mammals (Association of Monterey Bay Area Governments, 1978). In addition to the general regulations described above, it is unlawful to fly any aircraft less than 1000 feet above the refuge. Lawful occupants of private lands located within the refuge may take otherwise unprotected birds and mammals on such lands without a permit.

c. Marine Life Refuges [California Fish and Game Code §10500(f)]

It is unlawful in a marine life refuge to take or possess any invertebrate or specimen of marine plant life. Such refuges are generally established to promote research activities.

For example, the Hopkins Marine Life Refuge includes ocean waters extending 1000 feet from the mean high tide line adjacent to the eastern part of the city of Pacific Grove at the southern end of Monterey Bay (California Fish and Game Code §10901). Both the Hopkins and the Pacific Grove Marine Gardens Fish Refuge (see below) are established principally to protect the richness and sensitivity of the rocky intertidal ecology. The most important

feature of both areas is the number of small rocky islands in the nearshore area, which provide resting and nesting places for marine birds and mammals, particularly the California Sea Otter. Associated with these rocky areas are dense beds of giant kelp (Association of Monterey Bay Area Governments, 1978). While the taking of invertebrates and marine plant life specimens is generally prohibited, officers, employees, students, and licensees of Stanford University and the University of California are permitted to do so for scientific purposes without a permit.

d. Fish Refuge [California Fish and Game Code §10500(c)]

The taking and possession of fish or amphibia and the use and possession of any contrivance designed to be used for catching fish are generally prohibited in a fish refuge.

For example, the Pacific Grove Marine Gardens Fish Refuge includes ocean waters of Monterey Bay to a depth of 60 ft. (18.1 m) measured from mean low tide adjacent to the City of Pacific Grove. Its western and eastern boundaries correspond to extensions of the western and eastern corporate limits of the city. The Hopkins Marine Life Refuge falls within the boundaries of the fish refuge (California Fish and Game Code § 10801).

For management purposes the refuge is divided into two areas applying different regulations for the taking of fish in each area. In the western half of the refuge, abalone and sea urchin may be taken commercially, except that the area may be closed if it is

determined that the depletion of these species will endanger the balance of marine life. Fish, other than mollusks and crustaceans, may be taken throughout the refuge pursuant to a sport fishing license. In addition, marine life may be taken for scientific purposes pursuant to an appropriate permit. Finally, sardines, mackerel, anchovies, squid, and herring may be taken by net or bait in both areas of the refuge.

e. Marine Reserves

Marine Reserves are established by the Department of Fish and Game for a wide variety of purposes and, thus, no general regulations exist. Rather specific regulations for each reserve are designed to protect the unique forms of marine life peculiar to it.

For example the Año Nuevo State Reserve consists of mainland areas on Año Nuevo Point, ocean waters stretching 100 ft. (30.4 m) from the low tide mark adjacent to those areas, and Año Nuevo Island. The reserve is managed by the State Department of Parks and Recreation, due to the large numbers of visitors it receives. The entire area of the reserve is owned by the state. The basic purpose for its establishment is to encourage the reintroduction of pinniped populations and to protect them from human disturbance.

Regulations prohibit the taking of invertebrates on the mainland shore between the high tide mark and 100 feet beyond the low tide mark [14 California Administrative Code § 29.05(b)(3)]. In addition, it is unlawful to fly aircraft less than 1,000 feet above the land and water area of the reserve (California Fish and

Game Code §10501.5).

Regional Water Quality Control Boards (RWQCBs) are responsible for integrating Areas of Special Biological Significance (ASBS) designations into their area wide basin plans, which outline waste discharge prohibitions and restrictions. A routine ASBS reconnaissance survey conducted by the State Water Resources Control Board (SWRCB) provides RWQCBs with detailed resource information as well as data on existing or future uses that are apt to threaten ASBS environmental quality. ASBS surveillance and monitoring by RWQCBs ensure's compliance with discharge regulations in the broader context of basin wide enforcement. Should either an actual discharge violation or a threat thereof become apparent, the regional board is empowered with specific administrative procedures and remedies to enforce compliance (see California Water Code, Section 13300).

The following ASBSs have been designated within the study area:

- (1) Año Nuevo Point and Island: This ASBS includes ocean waters extending 3 nm (5.6 km) from the mean high tide line on the mainland coast bounded on the north by a line extending southwest from the San Mateo-Santa Cruz County line. The ASBS thus covers a considerably larger area than the Año Nuevo State Reserve.
- (2) Pacific Grove Marine Gardens Fish Refuge and Hopkins Marine Life Refuge: This ASBS includes ocean waters contained within the Pacific Grove Marine Gardens Fish Refuge (see above).
- (3) Carmel Bay: This ASBS includes waters contained within the

Carmel Bay Ecological Reserve (see above).

(4) Point Lobos Ecological Reserve: This ASBS includes ocean waters contained within the Point Lobos Ecological Reserve (see above).

(5) Julia Pfeiffer Burns Underwater Park: This ASBS includes ocean waters contained within the Julia Pfeiffer Burns Underwater Park (see below).

(6) Ocean Area Surrounding the Mouth of the Salmon Creek: This ASBS includes ocean waters extending from the mean high tide line to the 100-foot isobath or 1000 feet offshore, whichever is greater between the Monterey-San Luis Obispo County line and a point approximately five miles north. This is the only ASBS in the study area that does not correspond to a state refuge, reserve, or underwater park. It was established primarily to protect fragile rocky intertidal and kelp forest habitat.

2. State Historic Parks (California Public Resources Code §5020.4)

Preservation of representative and unique archaeological, paleontological, and historical sites in the land and water areas of the state is the responsibility of the California Historical Resources Commission. The Commission evaluates and makes recommendations to the State Historic Preservation Officer on nominations to the National Register (see Section on Historic Resources above for nominated sites).

The Commission also recommends state registration of sites as

landmarks and points of interest to the Public Resources Department which is responsible for maintenance of registered sites (California Public Resources Code §5020.4). Registration as a point of interest is normally accompanied by the placement of informational signs. Landmarks, along with properties listed on the National Register and city or county registers or inventories, become eligible for qualified historic property status for which special protection may be afforded (California Public Resources Code §5031). At present, no sites within the study area have been registered as either landmarks or points of interest.

3. California State Park System and Beaches

The California Department of Parks and Recreation is responsible for managing State Parks and Beaches for their recreational and aesthetic value (Table X). However, in order to protect special marine resources and water-based recreational values in ocean waters within state jurisdiction and to expand coastal park units beyond the water's edge, the California Department of Parks and Recreation has established an Underwater Parks Program.

For example, Point Lobos Ecological Reserve, the first underwater park in the United States, was established in 1960. As described above, while the DPR manages the reserve, it is operated under the legal authority of the Fish and Game Code.

Julia Pfeiffer Burns State Park, on the other hand, is both owned and operated by the DPR. The underwater park contains 2.6 nm (4.9 km) of coastline and adjacent ocean waters and submerged lands

between Partington Point and McWay Rock Falls. It is managed in conjunction with the adjacent land-based park. There are no regulations on recreational activities. Instead, visitation is controlled by a permit system; and permits are usually only given to clubs with an experienced diving master. Several other locations are currently under consideration for designation as underwater parks. These include expansions of Point Lobos and Julia Pfeiffer Burns and new parks at Año Nuevo State Reserve, Wilder Ranch State Park and Cannery Row.

III. Section: Human Activities

A. Fishing

1. Commercial Fishing

The Monterey Bay area has a large and economically important commercial fishing industry. The major commercial fishing ports are Princeton, Santa Cruz, Moss Landing and Monterey. Table XX, derived from California Department of Fish and Game statistics, shows a summary of the poundage and ex-vessel value (greater than \$20,000) of landings of some of the commercial species at the four major ports in the study area. In 1987, a total of over 34 million pounds of fish with an ex-vessel value of almost \$15 million was landed at Moss Landing, Monterey, Santa Cruz and Princeton. Salinas processes fish landed primarily at Monterey. The retail value of the fish to the local economy is worth two to three times that of the ex-vessel value. The diversity of the commercial catch is shown by the number of different species or species groups landed at each port: 89 at Monterey, 69 at Moss Landing, 59 at Santa Cruz, and 71 at Princeton. These statistics also include shrimp, crab, octopus, squid, eels, lobster, abalone, and sea urchins.

There are five main types of commercial fisheries in the Monterey Bay area: 1) a troll (hook-and-line) fishery for salmon and albacore, 2) a trawl fishery for the various species of rockfish and flatfish, 3) a gill and trammel net fishery for California halibut, rockfish, and white croaker, 4) a roundhaul and lampara net fishery for squid, anchovy, and herring and 5) a trap

Table XX: Summary of Poundage and Value (over \$20,000 only) of Fisheries Data for the Ports of Santa Cruz, Moss Landing, and Monterey (including processing facilities at Salinas), CDF&G, 1987, and for the Port of Princeton, CDF&G, 1989.

Common Fish Name	Santa Cruz		Moss Landing		Monterey		Princeton	
	Pounds	Value	Pounds	Value	Pounds	Value	Pounds	Value
Salmon	193,085	565,070	276,218	793,564	236,520	658,754	878,624	2,007,603
Rockfish (ALL)	56,317	32,651	3,257,030	1,052,225	2,675,657	1,029,657	832,704	360,010
Swordfish	34,558	135,771	96,129	381,664	262,441	1,019,270		
Squid			4,056,560	381,905	8,312,730	843,392		
Sole (All)			1,717,164	541,364	261,855	105,296	963,278	430,096
Tuna	50,583	39,283	1,195,167	868,427	97,779	69,410		
Sablefish			613,360	182,953	258,867	57,979	350,902	169,345
Cal. Halibut	50,769	113,524			397,662	86,054	19,672	53,582
White Croaker			215,161	68,004	81,350	20,857	331,265	118,420
Lingcod			171,660	57,856	139,675	52,762	266,455	121,048
Mackerel					2,546,110	144,693		
Sandab			75,593	24,366			645,762	196,691
Shark	14,669	21,660			87,531	86,591		
Anchovy					1,153,530	75,077		
Rock Crab							17,083	19,087
Dungeness Crab							276,374	478,472
Abalone							127,249	511,189
Urchin							725,700	222,524
Other	101,040	101,299	508,927	80,047	290,767	134,010	223,702	83,863
Total	500,991	1,009,238	12,182,969	4,438,335	16,444,484	4,383,842	5,658,770	4,841,930

fishery for dungeness and rock crab. Figures XX and XX show the location of primary commercial fishing areas and types of gear utilized.

There are approximately 6 to 15 gill-net boats; 8 trawlers using a mixture of otter trawls and roller trawls; and one to three trap boats participating in the commercial fishery off Monterey Bay (Personal Communication, Marine Resources Division, Monterey Bay area, CDF&G, March 1990).

2. Mariculture

There are presently eleven mariculture operations within the area. Silverking Oceanic Farms in Davenport operates a silver and king salmon hatchery. Up to one million fish may be released to the ocean annually. These fish mature in the ocean with about two to three percent of them eventually returning to the farms to spawn where they are harvested for sale. This company is planning to raise Atlantic salmon in pens for eventual sale.

Pacific Mariculture is involved in research to determine the feasibility of culturing abalone for sale to restaurants and markets. It is now completing research and development at the Long Marine Laboratory and recently received approval from Santa Cruz County for production of abalone.

Pacific Mariculture is the only bivalve mollusc hatchery in California. It produces oyster and clam seed for grow-out to other growers.

There are two inactive oyster leases (Danny Burns Shellfish and Monterey Bay Marine Farm) which are limited in their operations

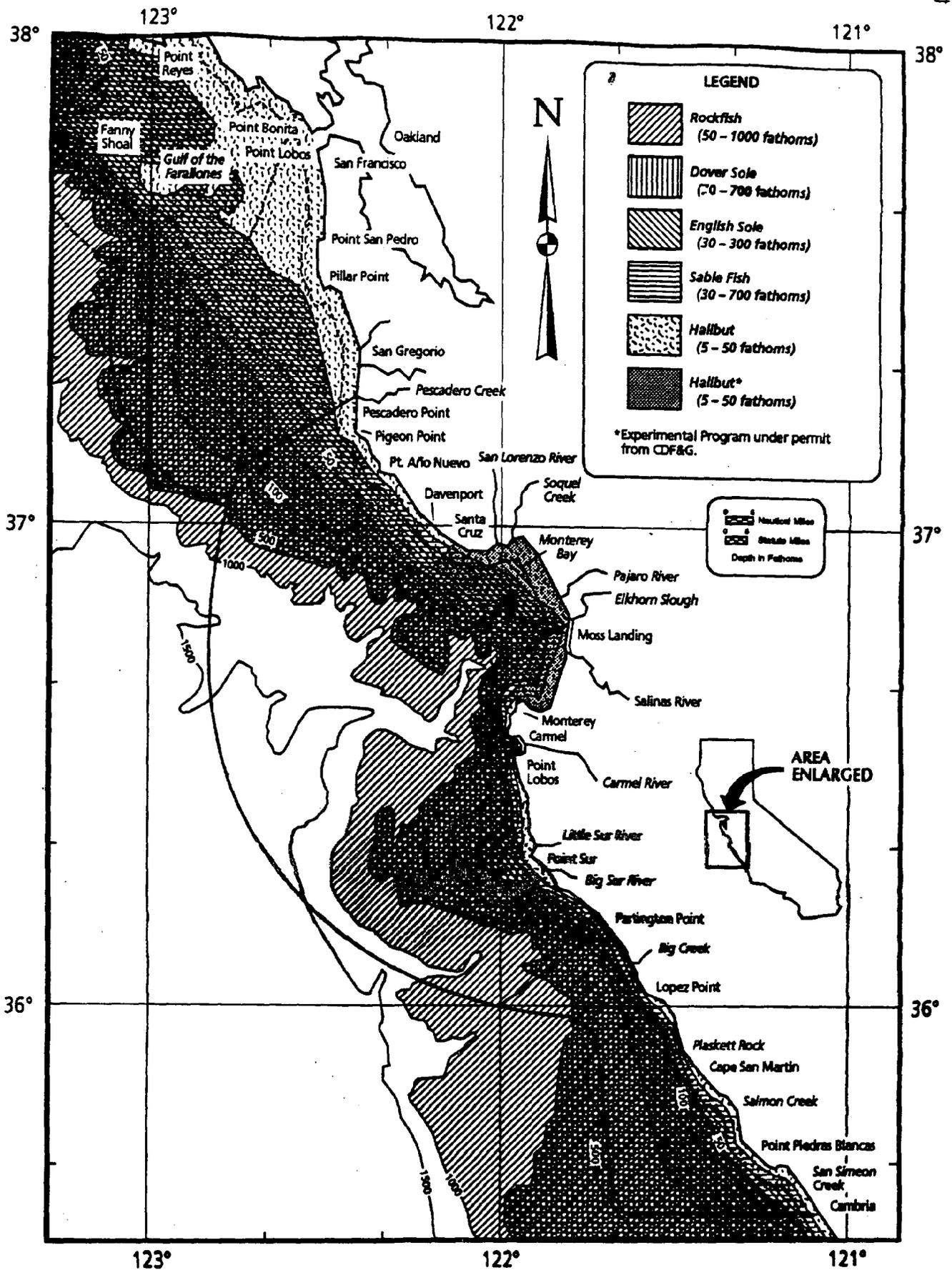
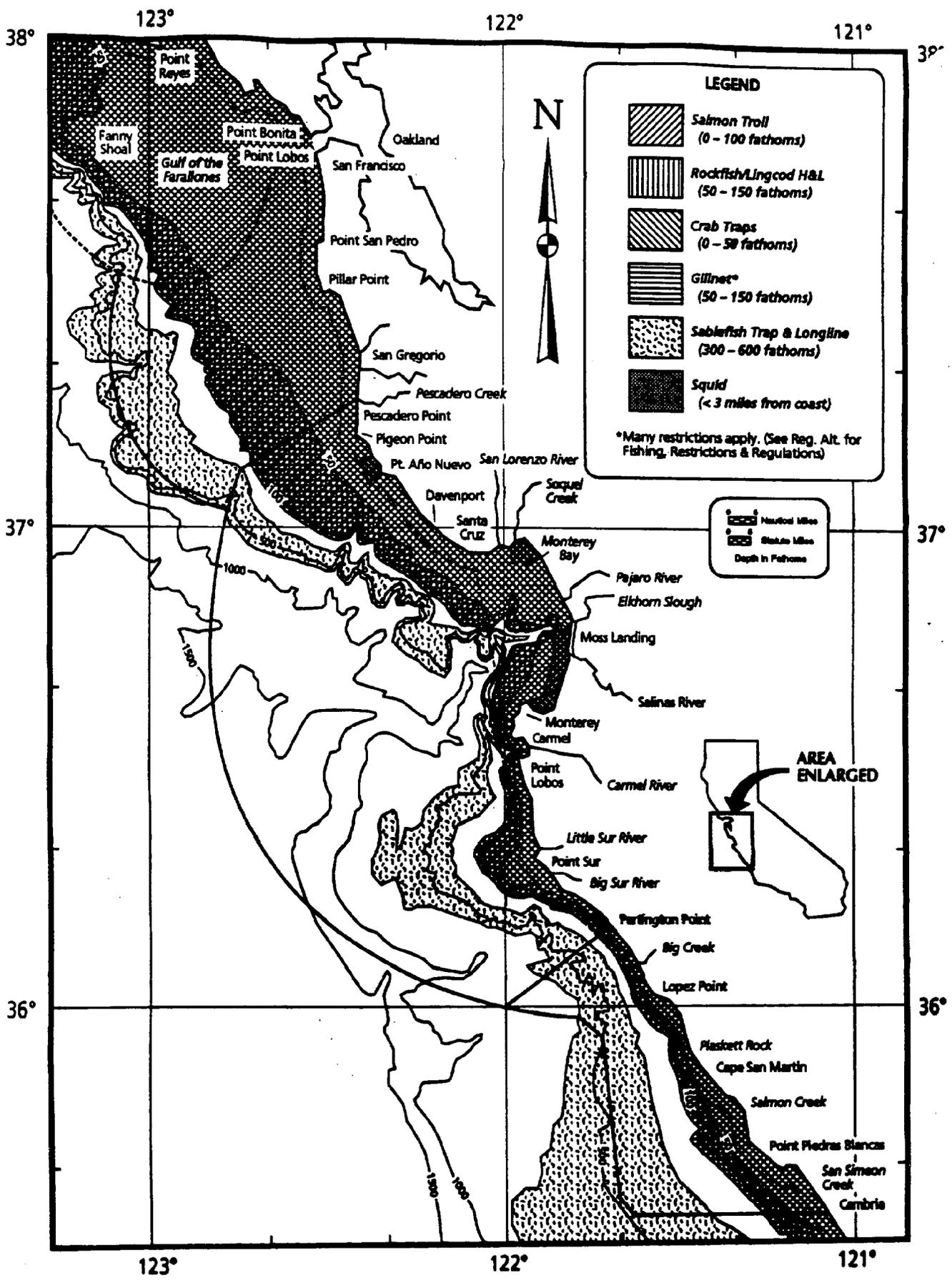


Figure 14. Trawl Fishery. Atlas of Marine Resources for Central California, Central Coast Regional Studies Program, August 1990.



LEGEND

-  **Salmon Trawl**
(0 - 100 fathoms)
-  **Rockfish/Lingcod H&L**
(50 - 150 fathoms)
-  **Crab Traps**
(0 - 50 fathoms)
-  **Gillnet***
(50 - 150 fathoms)
-  **Sablefish Trap & Longline**
(300 - 600 fathoms)
-  **Squid**
(< 3 miles from coast)

*Many restrictions apply. (See Reg. Alt. for Fishing, Restrictions & Regulations)

 Nautical Miles
 Statute Miles
 Depth in Fathoms

AREA ENLARGED



because of water quality problems in the Elkhorn Slough growing waters.

Sea Life Supply raises sea hares (a species of nudibranch or sea slug) in grow-out pens near the mouth of Elkhorn Slough. They are used for neurophysiological research.

Until recently, Ocean Genetics, Inc. operated an algae research farm where a variety of forms of algae were grown for chemical extracts, such as agar and medicinal materials. A new company, Quantify, Inc., was recently started and is presently raising algae using Long Marine Laboratory water to produce phycobiliproteins.

Granite Canyon Marine Laboratory of the California Department of Fish and Game is actively involved in aquaculture research. It is presently studying the feasibility of abalone aquaculture and planning some form of marine finfish aquaculture.

Until 1988, Aquaculture Enterprises, Inc. operated a lobster hatchery and grow-out. Most research involved hybrid development to maximize growth rates. Some lobsters were sold to market.

Abalone West and Pacific Abalone Farms are each involved in red abalone research and development.

3. Kelp Harvesting

Kelp is harvested commercially for alginate extraction. KELCO, a San Diego based company has harvested Macrosystis pyrifera (Giant kelp) since 1970. KELCO harvests once a year and sometimes twice depending upon seasonal growing conditions. Almost all of the harvesting is done with a 4 to 5 miles area between Point Sur

and Pfeiffer Point. Approximately 5,000 tons of kelp (wet weight) are harvested a year from the study area compared with approximately 151,000 tons of kelp (wet weight) harvested in 1990 from all of California, (primarily in southern California). KELCO uses 3 harvesting vessels, two of 400 wet ton capacity and one of 600 wet ton capacity.

Kelp is also harvested as food for abalone by four small aquaculture facilities (Foster, pers. comm., 1989). These companies use small vessels, less than 30 feet, and together harvest approximately 500 tons/yr.

B. Hydrocarbon and Mineral Activities

1. Oil and Gas

Activities in the Central California Planning area began in 1963 when the first Federal OCS oil and gas lease sale resulted in the acceptance of bids for 29 tracts in the area off San Francisco. Twelve exploratory wells were drilled but no development occurred and all leases were relinquished in mid-1968.

The Minerals Management Service, within the U.S. Department of Interior, is authorized to prepare and implement 5-year plans which identify the federal waters to be opened for offshore oil drilling. The Monterey Bay Sanctuary study area lies within the central California planning region (Figure XX). MMS estimates that the high case conditional mean estimate of the undiscovered, economically recoverable oil resource for the entire Central California Planning area is 530 million barrels and 920 billion

cubic feet of gas (Cooke and Dellagiardino, in press). Conditional mean values for oil resource within the proposed Sanctuary study area is 370 million barrels and 580 cubic feet of gas (MMS Pacific Regional Office, 1991). (Conditional mean estimates for all proposed boundary alternatives are provided in **Figure X**). The first lease sale scheduled for the Central California region was Lease Sale #119 which was subsequently canceled in 1990.

The latest draft proposal Comprehensive Program for OCS Natural Gas and Oil Resource Management considers only studies and no leasing in the Central California area through 1997. Approval of this proposal is due in Mid-1992. Future 5-Year Plans may consider leasing other geographical areas within the central California planning area that may contain additional hydrocarbon resources.

The current Federal Lease Sale process, which takes up to two years, includes public hearings, environmental studies, and recommendations from the Governor.

President Bush in July, 1990 declared that OCS activities within the proposed boundaries (Boundary Alternative #2, of approximately 2,539 square nautical miles) of the Monterey Bay National Marine Sanctuary would be permanently prohibited. All state waters off central California have been designated by the State as an oil and gas sanctuary (Sections 6871.1 and 6871.2 of the California Public Resources Code). No oil and gas leasing is permitted within this three-mile state limit.

The six central California coastal counties (Monterey, Santa

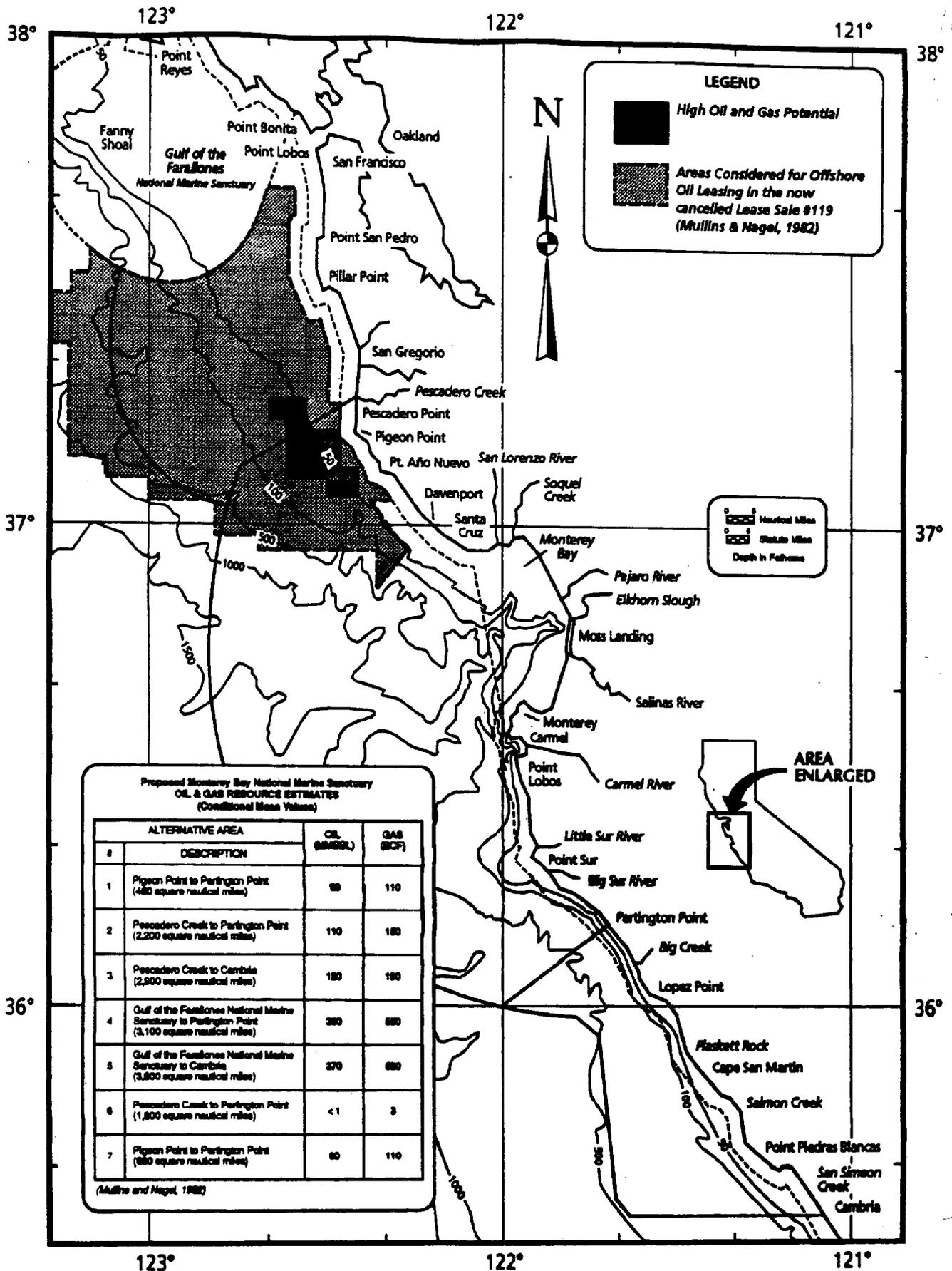


Figure 16. Potential Oil and Gas Development in the Vicinity of the Monterey Bay.

Cruz, San Mateo, San Francisco, Marin, and Sonoma) are cooperatively sponsoring a Central Coast Counties OCS Regional Studies Program to identify and assess the implications of potential offshore oil development in the Central Coast area.

2. Sand Mining

Sand for commercial use has been dredged in the bay area for the last 70 years (Clark and Osborne, 1982). Deposits in the southern part of the bay, below the high tide line, are presently being mined by the Monterey Sand Company. This company operates sand extraction plants in Marina and Sand City. About 150,000 cubic yards of sand have been extracted every year since 1978, from the surf zone and ocean. The Monterey Sand Company has applied to the Department of the Army, Army Corps of Engineers, for authorization to continue its sand extraction activities of 150,000 cubic yards annually for a ten year period.

Lone Star Industries, Inc. operates a facility at Marina which dredges approximately 200,000 cyds./yr. of sand from an inland pond at the rear of the beach which is presumably naturally resupplied with coarse beach sand during high tides. Prior to 1987, Lone Star mined between 50,000 and 100,000 cyds./yr. at an additional facility in Sand City.

C. Vessel Traffic, Harbors and Dredging

1. Vessel Traffic

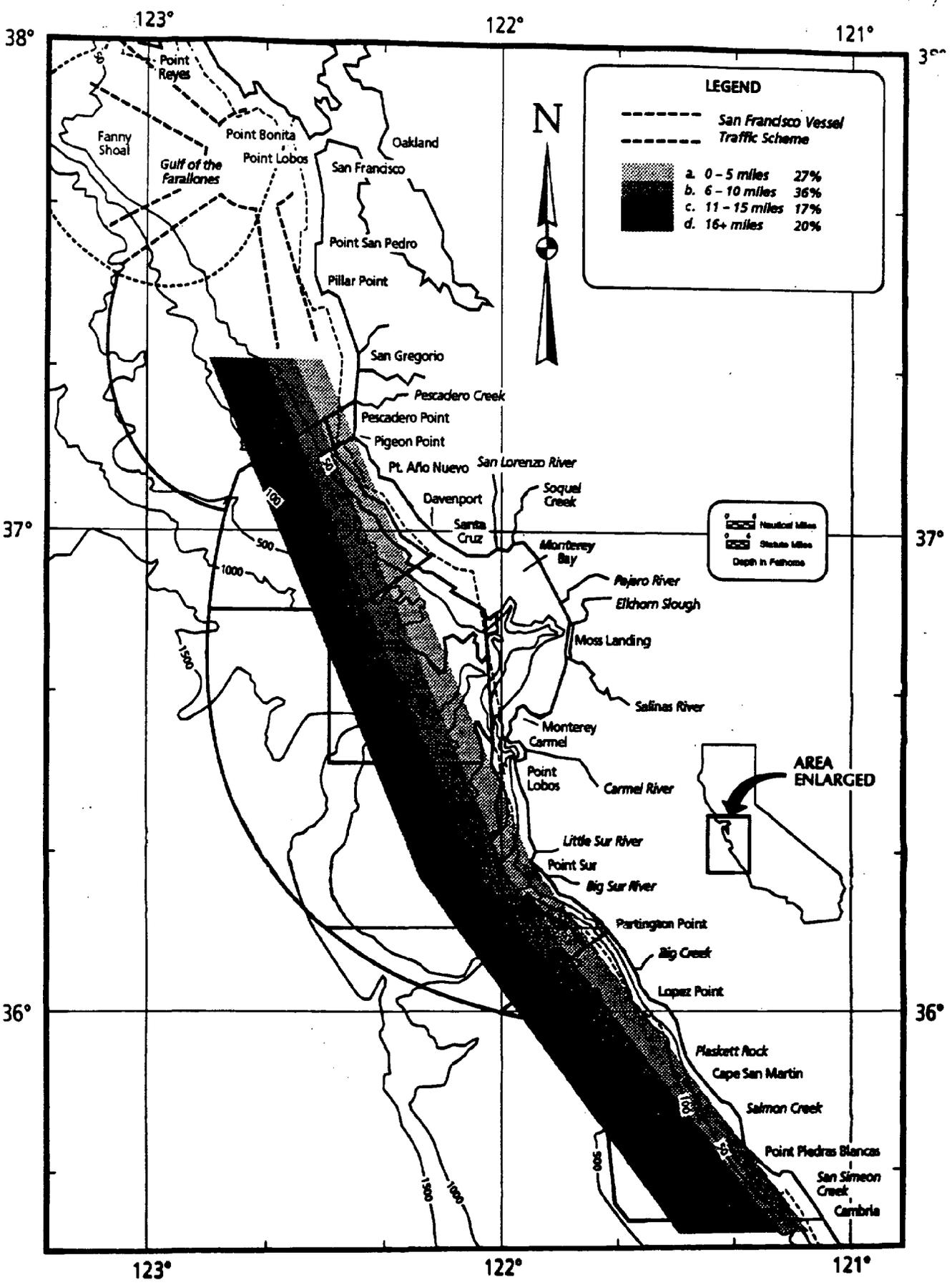
a. Commercial Shipping

Almost 9,000 commercial vessels (excluding domestic fishing craft) entered and exited the San Francisco Bay entrance in 1988

(Table X). Of these vessels approximately 4,500 vessels, including foreign flag vessels transit south through the study area to and from San Francisco. The majority of these southern vessels were passenger and dry cargo vessels. Just under 25% of the vessels moving to and from San Francisco to the south, and through the Sanctuary study area, were tankers of medium size (draft less than 50 feet). In contrast tankers approaching and exiting San Francisco to the north contain a large proportion (approx. 5%) of large tankers (draft greater than 50 feet).

Most of the commercial shipping along the coast follows customary north-south shipping lanes. Tankers loaded with oil from Alaska pass along the central coast of California approximately 85 nautical miles offshore from Point Sur and those bound for the Los Angeles area turn to the east at a point about 100 nautical miles southwest of Point Sur and then gradually approach the entrances to the Santa Barbara Channel (U.S. Coast Guard, 1983). Vessels travel in approximately a straight line between the end of the Santa Barbara Channel Traffic Separation Scheme (TSS) and the San Francisco Bay entrance TSS (Texaco, 1989, in CMC, 1991) (Figure XX). These vessels would therefore travel within 10 to 15 miles of Point Sur. Approximately 27% of vessel traffic are within 0-5 miles; 36% within 6-10 miles; 17% within 11-15 miles and; 20% over 16 miles off headlands (CMC, 1991).

The U.S. Coast Guard proposed to establish a routing system that amended the San Francisco Traffic Separation Scheme (TSS) and the Santa Barbara Channel TSS and linked them with a Shipping



Safety Fairway (SSF). The proposal is currently on hold as the U.S. Coast Guard responds to comments on the proposal.

Some commercial shipping vessels enter Monterey Bay. In 1986, a total of 5 vessels offloaded at either Monterey Harbor or Moss Landing Harbor (U.S. Army Corps of Engineers, 1986). Until 1982, tankers delivered oil products to Pacific Gas and Electric's (PG&E) power generating plant at Moss Landing. The plant burns natural gas as its primary source and has the capability of burning either gas or oil. From 1982 to 1989 the plant returned to burning gas and is now using oil for its fuel source.

PG&E uses a permitted marine terminal for offloading oil from 50,000 DWT tankers. PG&E was denied permission to construct an offshore marine terminal for off-loading oil from 90,000 DWT tankers.

Oil tanker traffic may increase in the future depending on whether any OCS lease sales occur in the area and whether it is determined preferable to transport oil by pipeline versus by tanker. However, maintenance and supply vessels for the offshore platforms would cause an increase in small vessel traffic in the area.

b. Commercial Fishing Vessels

Numerous commercial fishing vessels, including kelp harvesting boats, use the Monterey Bay area and many are based at one of the four harbors in the area. (For a discussion on numbers and types of fishing vessels see above under Fishing).

c. Research Vessels

The numerous marine research facilities in the area conduct frequent surveys and experiments from specially equipped research vessels. Research includes collecting biological samples to communication with submarines and guidance of Remotely Operated Vehicles (ROVs). Research vessels may also conduct seismic surveys of the ocean floor to determine sub-seafloor geologic features.

d. Recreational Boating

Recreational boating in California is popular in the more sheltered environments of San Francisco Bay and around the Channel Islands of southern California. However, recreational fishing is an important use of the central California area and whale-watching trips are growing in popularity.

Also, an annual speed-boat race for charity occurs across the mouth of Monterey Bay with boats reaching speeds of over 100 mph. Charter boats on the way to fishing grounds or nature-viewing areas can also reach speeds in excess of 25 knots.

2. Harbors

a. Princeton/Pillar Point Harbor

San Mateo County Harbor District operates the Pillar Point Harbor in Princeton. It is the base for a large commercial fishing fleet, particularly salmon fishing vessels from all of California, as well as numerous small recreational boats. The harbor facilities include: 369 berths, 60 percent for commercial and 40 percent for recreational vessels; a fuel dock; a 100 ton ice facility; and a new 6 lane sport-fishing boat launch. Three

commercial fish buyers are based in the port. A fishing pier and Johnson Pier provide recreational land-based fishing opportunities. Two outer breakwaters built in the 1960s and two more recent inner breakwaters built in 1984 provide excellent protection to the moored vessels.

b. Santa Cruz Harbor

The City of Santa Cruz established in 1950 a special zone within the City limits for the harbor district, governed by a board of commissioners. Berths exist for 215 commercial fishing vessels and 759 recreational boats. The recreational use of this harbor is very high and it is not unusual to have 30 percent use of the slips during the weekends.

c. Moss Landing Harbor

The Moss Landing Harbor was created by special legislation in 1947 designating the Moss Landing Harbor District a political subdivision of the State of California (California General Laws §5118). It consists of the harbor entrance, north and south harbors and Elkhorn Slough. The northern harbor is used primarily by recreational boats with 110 berths available. The southern harbor is used primarily by commercial vessels (approximately 2/3) with 488 berths available. The entrance is protected by two parallel jetties approximately 600 feet apart. Recently there is a proposal to extend the northern harbor by dredging tidal-mudflats to the north of existing berths.

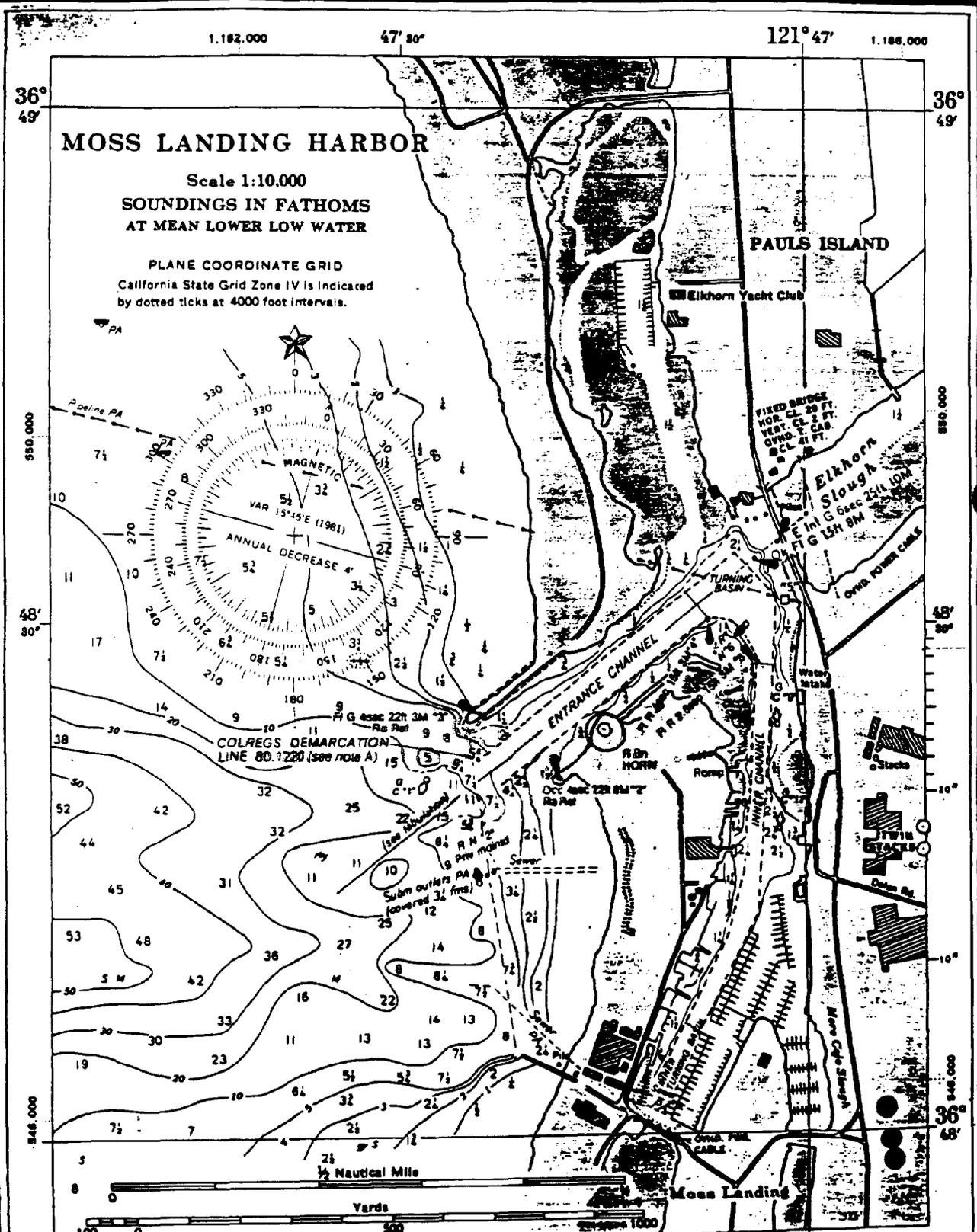
d. Monterey Harbor

Monterey Harbor has had a long history of development and

SOUNDINGS IN FATHOMS

Nautical Chart Catalog No. 2, Panels N, P

18685



activity since the late 1700s. It was used by English and Russian ships that stopped for supplies and trade while on pelt and whale oil expeditions. It is owned and operated by the City of Monterey and has two wharves and two boat launch ramps. Commercial fishermen use 175 of the 425 available berths at the marina. An additional 150 moorings are available in open water between the breakwater and the two wharves.

3. Dredging

Periodic dredging of sediments is required at Santa Cruz, Moss Landing and Monterey harbors to provide access to boaters as well as for safety concerns. The boat harbor of Santa Cruz is dredged annually removing 100,000 to 130,000 cubic yards of sand. Moss Landing harbor requires dredging every two to three years and about 50,000 cubic yards of material are removed a year. Monterey harbor only requires minor maintenance with removal of approximately 2,000 cubic yards of material (primarily sand) each year.

Princeton Harbor does not yet conduct any dredging operations but may need to do so in the future.

The entrance way to the Golden Gate within the northern portion of the study area also requires dredging to maintain the ship channel in and out of San Francisco Bay at a project depth of 55 feet.

4. Dredge Disposal

Most dredge material from Monterey and Santa Cruz dredging is composed of clean sand and is currently used for beach nourishment by being pumped directly to beaches east and south of the harbors.

Two offshore sites are presently being used for dredged material disposal from Moss Landing harbor (Figure xx). Disposal of dredged material has occurred intermittently off the end of Sandholdt Pier at Moss Landing about 400 feet from shore since 1947 (Disposal Site SF-12). When dredge spoils do not meet disposal criteria for beach nourishment, they must be taken by barge to a deep water disposal site near the head of the submarine canyon (Disposal Site SF-14) or to an appropriate land-based disposal site.

A Long-Term Management Study (LTMS) is underway by the EPA and Corps of Engineers to determine a location for the disposal of 400 million cubic yards of dredge material from San Francisco Bay and its entrance channel over a fifty year period. One of the five sites under consideration is currently used for the disposal of approximately one million cyds./yr. of sand that is dredged from the entrance channel and disposed of at a site approximately two nmi. due south (Figure XX).

D. Discharges, Deposits and Non-Dredge Material Dump Sites

1. Point Source Discharges

Appendix D provides a detailed breakdown of magnitude and effluent composition of point-source discharges by facility directly into the ocean and in adjacent watersheds.

There are eight municipal and two industrial sources of discharges which empty directly into the ocean of the Monterey Bay area study area (Figure XX): Within the preferred boundary

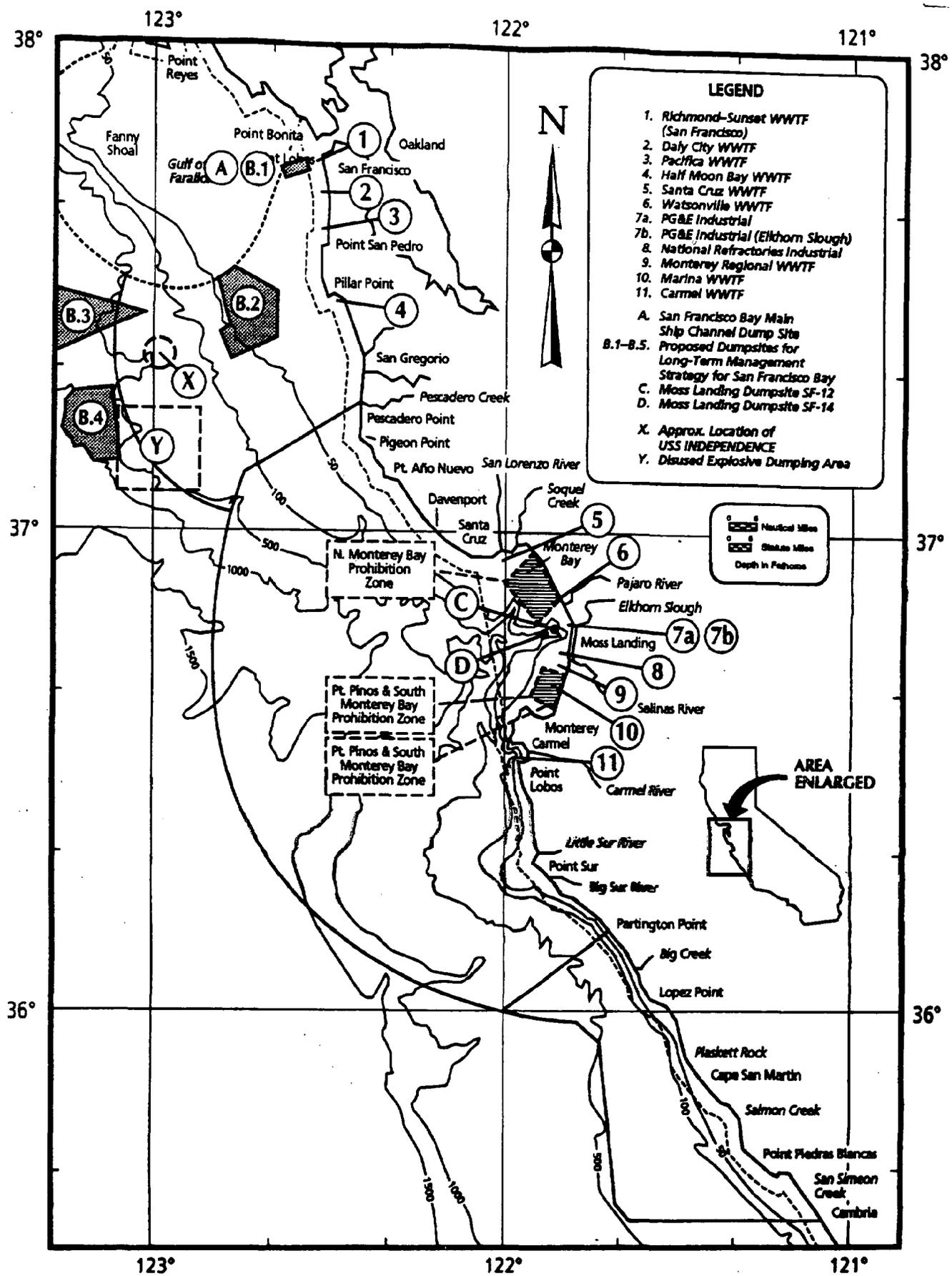


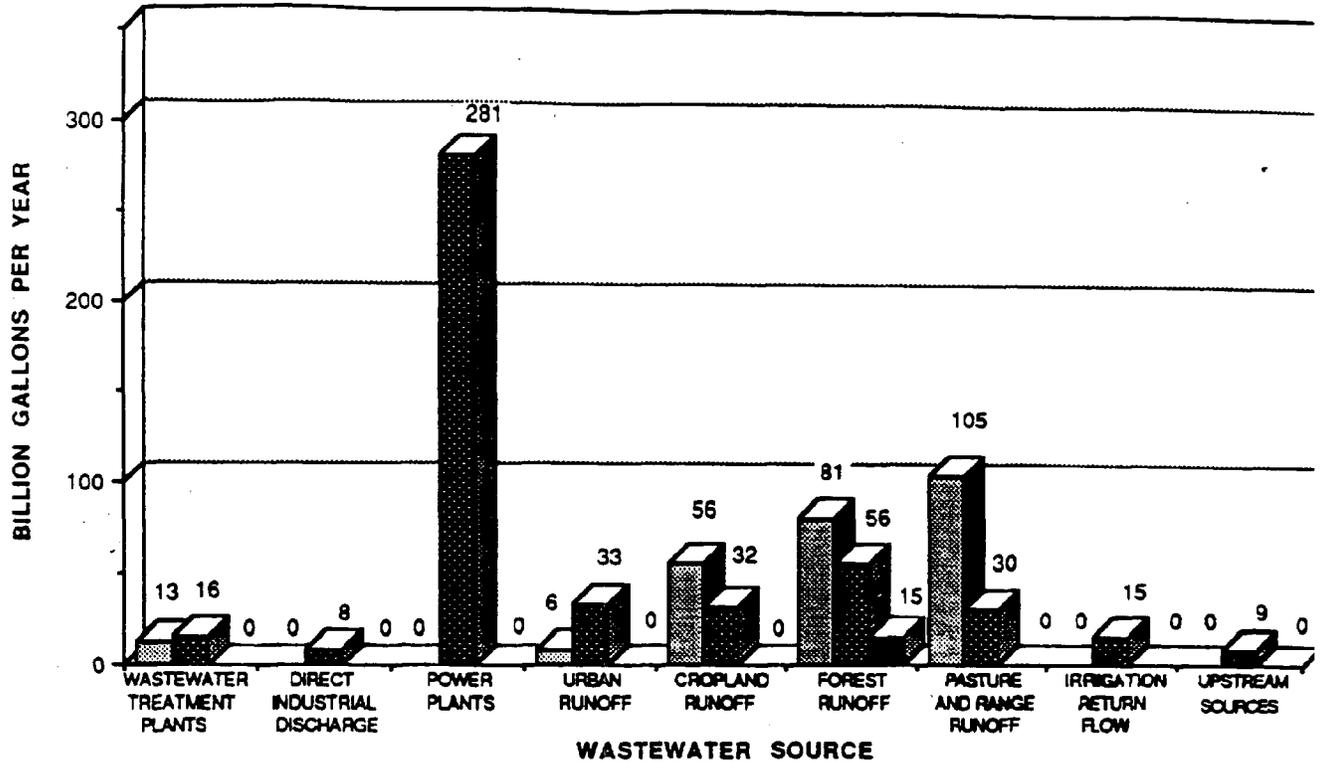
Figure 18. Ocean Discharge and Dump Sites (NOAA Chart 18680; EPA Region IX, 1991; NOAA, 1990).

alternative #2, there are four municipal dischargers: 1) Santa Cruz Wastewater Treatment Facility; 2) Watsonville Wastewater Treatment Facility; 3) the Monterey Regional Water Pollution Control Agency (MRWPCA) consisting of the cities of Castroville, Monterey, Salinas, Seaside and Fort Ord (and Marina by 1992) and the 4) Carmel Sanitary District at Pacific Grove. The two industrial dischargers within the preferred boundary are the 1) Pacific Gas and Electric power plant at Moss Landing, and 2) the National Refractories plant at Moss Landing.

Point source wastewater treatment plants and industrial discharges are major sources of pollutants in the northern and central areas (Figure XX). The PG&E plant discharges the vast majority of the total wastewater into the central area although the magnitude of pollutants associated with this discharge is small.

The Carmel Sanitary District, and the Monterey regional water sewage system treat wastes to a secondary level. The Monterey Bay regional water sewage system located to the north of Marina, and managed by the MRWPCA, has been operational since February, 1990. The treatment plant replaces small treatment plants at Monterey, Seaside, Fort Ord, Salinas, and Castroville (Marina will tie into this regional system at a later date, probably in 1992). The outfall associated with the new system receives the collective wastes from the five small treatment plants mentioned above. A 40% increase in capacity was planned into this regional system to handle the anticipated regional growth in population through at least 2005. The present population of 544,000 people in Monterey

Total Wastewater, by Hydrologic Unit and County, Discharged Into Areas Adjacent to the Monterey Bay National Marine Sanctuary Study Areas, by Source, circa 19



NORTHERN STUDY AREA
 CENTRAL STUDY AREA
 SOUTHERN STUDY AREA

Note: Power plants discharge large volumes of wastewater as a result of cooling water requirements. However, the mass of pollutants discharged from power plants is generally small.

Source: National Coastal Pollutant Discharge Inventory, Office of Ocean Resource Conservation and Assessment, National Ocean Service, Rockville, Maryland.

and Santa Cruz counties is projected to increase to 755,000 by the year 2005 (AMBAG, 1987).

The City of Santa Cruz is using two ocean outfall pipelines to dispose of treated sewage (Figure 11). The main outfall pipeline is 12,250 feet in length, in about 110 feet of water and one mile from shore. A secondary outfall pipe is used only during peak wet weather flows. This is the city's original ocean outfall pipe and it is only 2000 feet in length. The City WWTP is being improved and upgraded to treat sewage to a secondary level and by the Fall of 1990 was 75 percent complete.

The City of Watsonville also discharges primary sewage directly into Monterey Bay. Watsonville recently received a waiver postponing secondary treatment of their sewage. This permit will allow Watsonville to continue discharging primary treated sewage for another 5 years.

The PG&E plant discharges primarily cooling water at an elevated temperature and National Refractories discharges seawater with an altered ionic composition after removing magnesium.

In addition, numerous dischargers within the watersheds adjacent to the Monterey Bay study area, discharge into rivers and tributaries that eventually flow into the Sanctuary waters. For example, the cities of Gilroy and Morgan Hill, located outside the coastal counties, have adopted a Long Term Wastewater Management Plan to provide wastewater treatment and disposal capacity to accommodate the projected growth of the two cities. The Environmental Impact Report (EIR) for this project was challenged

and after revising the EIR to satisfy the issues raised a decision was reached in March 1991 to certify the EIR. The cities are now proceeding in three phases with the development of the discharge project. The first phase is the design for expansion of the existing plant to a secondary treatment level with nitrogen removal to 10 mg/l. The discharge of 7.1 million gallons per day will be disposed of entirely on land. Construction of the expansion is planned for 1992 and operation in 1994. Throughout these phases the Cities will continue studies and research to assist with plans for discharge to the Pajaro River during the winter months (Ross, pers. comm., April, 1990).

All major point-source municipal dischargers into the ocean and adjacent to the Monterey Bay study area are required to obtain a National Pollutant Discharge Elimination System (NPDES) permit that contains terms and conditions requiring monitoring of effluent to ensure water quality standards are maintained. For example, the City of Santa Cruz performs over \$150,000 ocean monitoring annually and analyzes 100 parameters with set limits on 28.

Two desalination projects are proposed for the Monterey Bay area to provide an alternative source of freshwater supply to the surrounding communities. Both projects are still in their planning phases and no locations or magnitudes of discharge have yet been determined.

2. Non-Point Source Discharges

Non-point source discharges includes runoff from urban, cropland, forest and pasture and range sources as well as

irrigation return flow and upstream sources. Non-point source discharges is the major source of pollution to the entire Monterey Bay area (Figure XX). Only natural forest runoff contributes non-point source pollution to the southern portion of the study area and this is negligible when compared to the magnitude of pollutants entering the entire study area. For a detailed breakdown and comparison of pollutant input from point and non-point sources into the different regions of the study area see Appendix D.

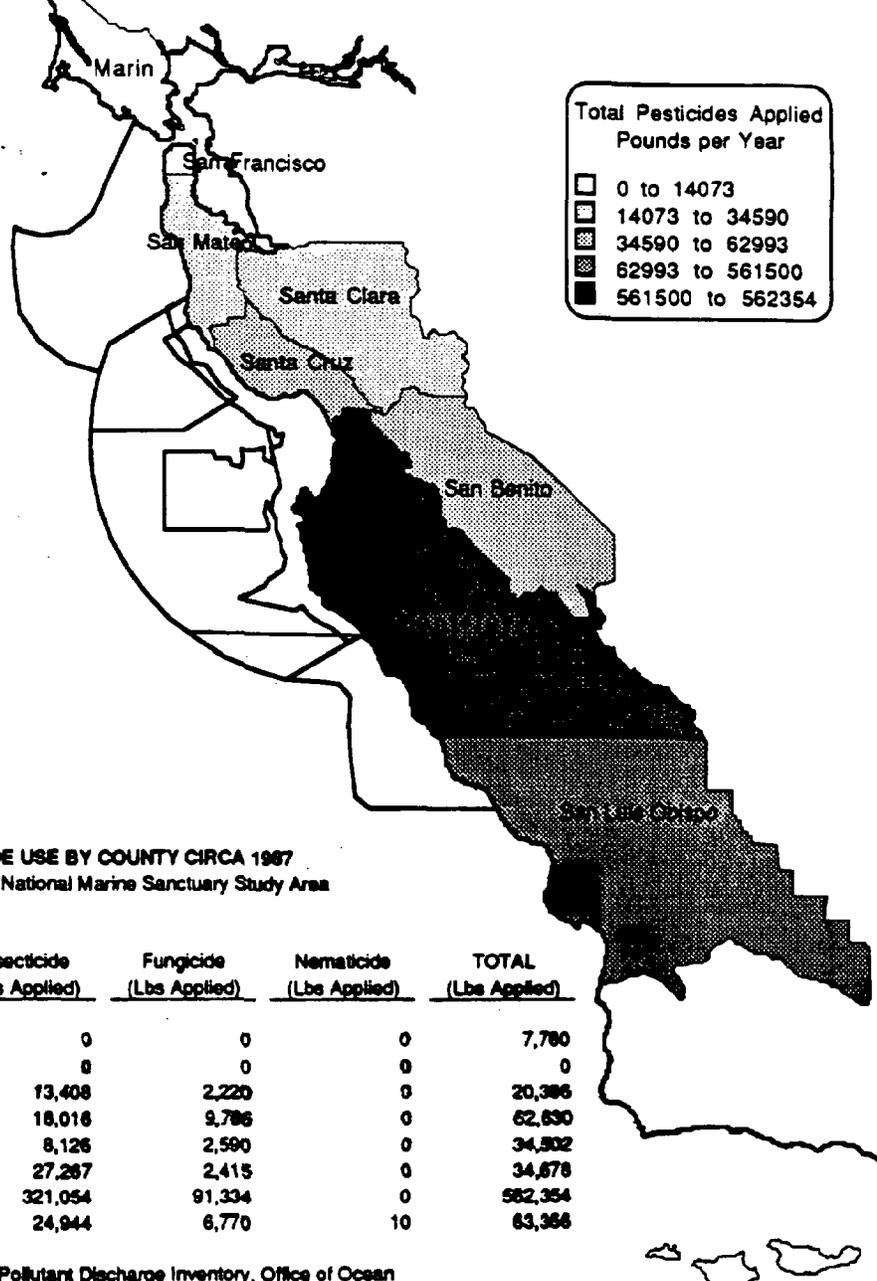
By far the greatest pesticide loading occurs in Monterey County reflecting the extensive, highly productive agricultural activities of Salinas Valley (Figure XX).

Another source of non-point source pollution is the garbage generated and disposed of by ships during their ocean voyages as well as by smaller boats in harbors and marinas. Because of past studies by the National Academy of Sciences and by the U.S. Coast Guard, ports are now required under Annex V of MARPOL, to provide reception facilities for vessel wastes garbage. Thus "ports of call" receive wastes that were traditionally disposed of in the ocean.

3. Desalination Plant Discharges

Desalination plants can be used to purify seawater, brackish ground water, or treated waste water. With the recent drought in California, coupled with escalating population growth and water delivery problems central coastal areas including Monterey Bay, are

AGRICULTURAL PESTICIDE USE IN COUNTIES ADJACENT TO THE PROPOSED MONTEREY BAY NATIONAL MARINE SANCTUARY



PESTICIDE USE BY COUNTY CIRCA 1987
Monterey Bay National Marine Sanctuary Study Area

COUNTY	Herbicide (Lbs Applied)	Insecticide (Lbs Applied)	Fungicide (Lbs Applied)	Nematicide (Lbs Applied)	TOTAL (Lbs Applied)
MARIN	7,760	0	0	0	7,760
SAN FRANCISCO	0	0	0	0	0
SAN MATEO	4,758	13,408	2,220	0	20,386
SAN BENITO	34,828	18,016	9,786	0	62,630
SANTA CLARA	23,786	8,126	2,590	0	34,502
SANTA CRUZ	4,996	27,267	2,415	0	34,678
MONTEREY	149,966	321,054	91,334	0	562,354
SAN LUIS OBISPO	31,632	24,944	6,770	10	63,356

Source: National Coastal Pollutant Discharge Inventory, Office of Ocean Resources Conservation and Assessment, National Ocean Service, Rockville, Maryland.

Map data prepared by Strategic Environmental Assessment Division, Office of Ocean Resources Conservation and Assessment, National Ocean Service, Rockville, Maryland.

considering the construction of desalination facilities.

While it is a proven and effective technology that has been widely used in the Middle East and in the Caribbean, the desalination of seawater has not been attempted until now in the continental United States. This has been primarily due to the high costs associated with seawater desalination compared to other sources of drinking water. The United States has over 1000 small plants that desalinate brackish groundwater. Although used principally for industrial uses, many plants provide drinking water, especially in Florida, where ground water must be treated before use.

The first sea water desalination plant in the United States was opened by the U.S. Navy on San Nicholas Island in late 1990. A second facility, to be operated by the Southern California Edison, is scheduled to open on Santa Catalina Island this year. The Navy unit will produce fresh water at a cost of \$1,625 per acre-foot (AF=325,851 gals.), which is substantially cheaper than the cost of barging water to the island.

A number of technologies have been developed for desalination, including vapor compression, ion exchange, electrodialysis, distillation, and reverse osmosis. Two of these technologies, distillation and reverse osmosis (R/O) are being considered for seawater desalination in California. Plants can be built as separate units or in combination with electricity generating plants, where the waste heat is used for the desalination process. In distillation, water is heated until it is turned into steam and

the salt and other contaminants are left behind. When the steam is condensed it becomes very pure water, In reverse osmosis, the seawater is passed through a thin plastic membrane with pores so small they only allow water molecules to penetrate.

While approximately 65 percent of all desalinated water worldwide is produced by distillation, virtually all of the U.S. plants are based on reverse osmosis, including those on San Nicholas Island and Santa Catalina Island. An emergency plant proposed to be built at Santa Barbara, California in late 1991, will be a reverse osmosis facility. The high costs of reverse osmosis facilities are for the production and maintenance of the sophisticated plastic membranes and for powering the pumps that provide the high pressures necessary to force water through the filters.

An advantage of reverse osmosis is that the operation requires about 50 percent less energy than distillation, and the feed water does not have to be heated. Another advantage of the R/O plants is that they take up less area than distillation plants and can be rapidly assembled in small modular units. The fouling of R/O membranes is the most serious disadvantage, as the plants must be shut down when they are cleaned or replaced.

In the Monterey Bay area, there is one existing industrial desalination operation and several proposals for producing drinking water from desalinated seawater. Exhaust steam from the Pacific Gas and Electric Company power plant at Moss Landing is used in the Mechanical Vapor Compressor Evaporator desalination unit. The

plant, which was licensed before 1950, produces 480 AF/year (475,000 gals/day) of 1 ppm product water, which is used in the power plant turbines.

The Sterling Hotel/ Conference Center in Sand City was approved by Sand City in 1985 but was denied by the California Coastal Commission that same year, in part, because of a discrepancy between the proposed water use and the Land Use Plan's allocation of water. A revised proposal was submitted that included a much lower level of water use, which would still exceed that allowed by LUP, but the excess water would be provided by a desalination plant. The plant would utilize reverse osmosis and would produce 20 AF/year (18,000 gpd). The intake water would be taken from a ground well. The project is still under review by the Coastal Commission.

In February 1991, the Monterey Peninsula Water Management Board contracted for a study to investigate seven different sites for the feasibility and costs of a desalination plant. In April 1991, Boyle engineering reported to the board that the most promising location for a desalination plant to serve the Peninsula was the Marina site of the Monterey Regional Water Pollution Control Agency. The second ranked site was the most landing PG&E power plant and the third most promising site was the abandoned Monterey waste water treatment plant across from the Naval Postgraduate School on a beach owned by the Marina Water District.

Although the Marina site appears to be the best location, it would need a new intake pipe from Monterey Bay for feed water.

Another drawback for the two top-ranked sites is that eight or fifteen miles of connecting line would have to be constructed, respectively, to tie a plant into Cal-Am Water Co's northern most water mains.

The site that is ultimately selected for the 3 million gallon/day plant will dictate to a certain extent the technology that is used. The favored Marina Regional plant could probably use reverse osmosis or distillation. The Moss Landing site might be best suited for a hybrid plant combining R/O and distillation. PG&E is doing an independent assessment of the Moss Landing location and is expected to complete a report in late spring. Regardless of the site selected, the District would have to get permits from up to seven different federal agencies, seven state agencies, three county agencies and two city departments.

In addition to the Monterey Peninsula Water Management District's proposal, the Marina Water District has contracted for a feasibility study of desalination plants, either inland or along the coast. They propose to build a plant that would produce 1,000 AF/year (0.9 million gpd), which would supply approximately 1/3 of the water needs of the City of Marina. The plant would most likely use reverse osmosis technology. If the plant is built on the coast, the preferred site would be at Marina's waste water treatment plant, located just to the south of the regional Water Pollution Control plant.

The Monterey Bay Aquarium is planning to build a reverse osmosis desalination unit on site to provide water for their

toilets. The unit would produce a maximum of 48 AF/year (43,000 gpd), but the average production is estimated to be about 24 AF/year (21,500 gpd). The quality of the water produced would be about 400 ppm and would cost \$1,800/AF. The brine would be mixed with the seawater used in the aquarium before it is discharged. Proponents of Monterra Ranch, a housing subdivision planned alongside the Monterey-Salinas Highway, have also applied to Monterey County for permits to build their own desalination plant.

4. Non-Dredge Material Dump Sites

There are three military areas used, (either currently or in the past), for the disposal of explosives and wastes (Figure XX).

First, part of an inactive explosive dumping ground occurs in the northern portion of the study area. Second, also in the northern portion of the study area, lie the remains of the USS INDEPENDENCE. This was a small aircraft carrier used as a target ship during the Bikini Atoll atomic bomb tests in 1947. It was sunk as a target during testing of aerial and undersea weapons off of Central California in 1951. Third, the dunes and adjacent ocean waters off of Fort Ord contain many spent rounds of ammunition fired by the army during practice drills at target ranges on the dunes. Many rounds missed the targets and ended up in the dunes or in the ocean where the steel-jackets of the bullets erode leaving behind a lead core. Finally, limited studies at the Fort Ord site itself, show both soil and groundwater are contaminated from the storage of hazardous wastes on-site.

Groundwater movement, surface water runoff and erosion of the

dunes provide pathways for the discharges and deposits on-site to enter the central portion of the Sanctuary study area.

E. Military Activity

Throughout the study area there are numerous areas of military activity representing all branches of the armed forces (Figure XX).

There are two military activity areas within Monterey Bay itself. The U.S. Army administers a restricted firing range impact area extending 8,000 yards offshore from its Fort Ord military installation (with more strict limits extending 5,000 yds offshore). Its purpose is to provide a safety buffer for the public against stray rounds from the small arms firing ranges. Activities are prohibited in the restricted area on days when the ranges are being used. This danger zone is also utilized for Navy mine warfare operations from February 16 through July 31 each year.

The U.S. Navy has an operating area in the northeast section of the Bay that can be used for mine sweeping practice maneuvers. Minehunting training is conducted by Navy minesweeping ships in this section of Monterey Bay eight times a year and each exercise lasts about one week. Inert metal shapes are placed (or moored) on the bay floor and are located only by sonar; nothing is dragged through the water during these training exercises and all objects are recovered after completion (Capt. Larson, Pers. Comm., August, 1989).

On occasion the U.S. Marines practice amphibious landings on the beaches adjacent to these two areas.

The northern portion of the study area overlaps with portions, or entire areas, of submerged submarine operating areas. During torpedo practice firing, all vessels are cautioned to keep clear of Naval Target Vessels flying a large red flag from the highest masthead.

A Warning Area (W-285) exists to the west of the proposed Sanctuary and overlaps the western boundary of the study area (approximately 992 square nautical miles). It is in frequent use for both air and surface training -- 700 scheduled uses occur per month (Capt. Larson, Pers. Comm., August, 1989). Among specific activities in the area is the expenditure of smoke markers, sonobuoys and ordnance.

A military air training route (IR-207) exists across the proposed Sanctuary starting from between Carmel and Monterey and proceeding northwest. It is used exclusively for air navigation at an altitude of 3000 feet above mean sea level with approximately 30 flights per month (Capt. Larson, Pers. Comm., August, 1989).

Finally, the southern portion of the study area overlaps with a small corner of the Pacific Missile Range.

F. Research and Education

The highly diverse biota and the physical features of Monterey Bay combine to provide outstanding opportunities for scientific research. The wide variety of habitats are all readily accessible to researchers. There are thirteen research and/or education programs in the entire study area (Figure xx).

The Hopkins Marine Station of Stanford University is located

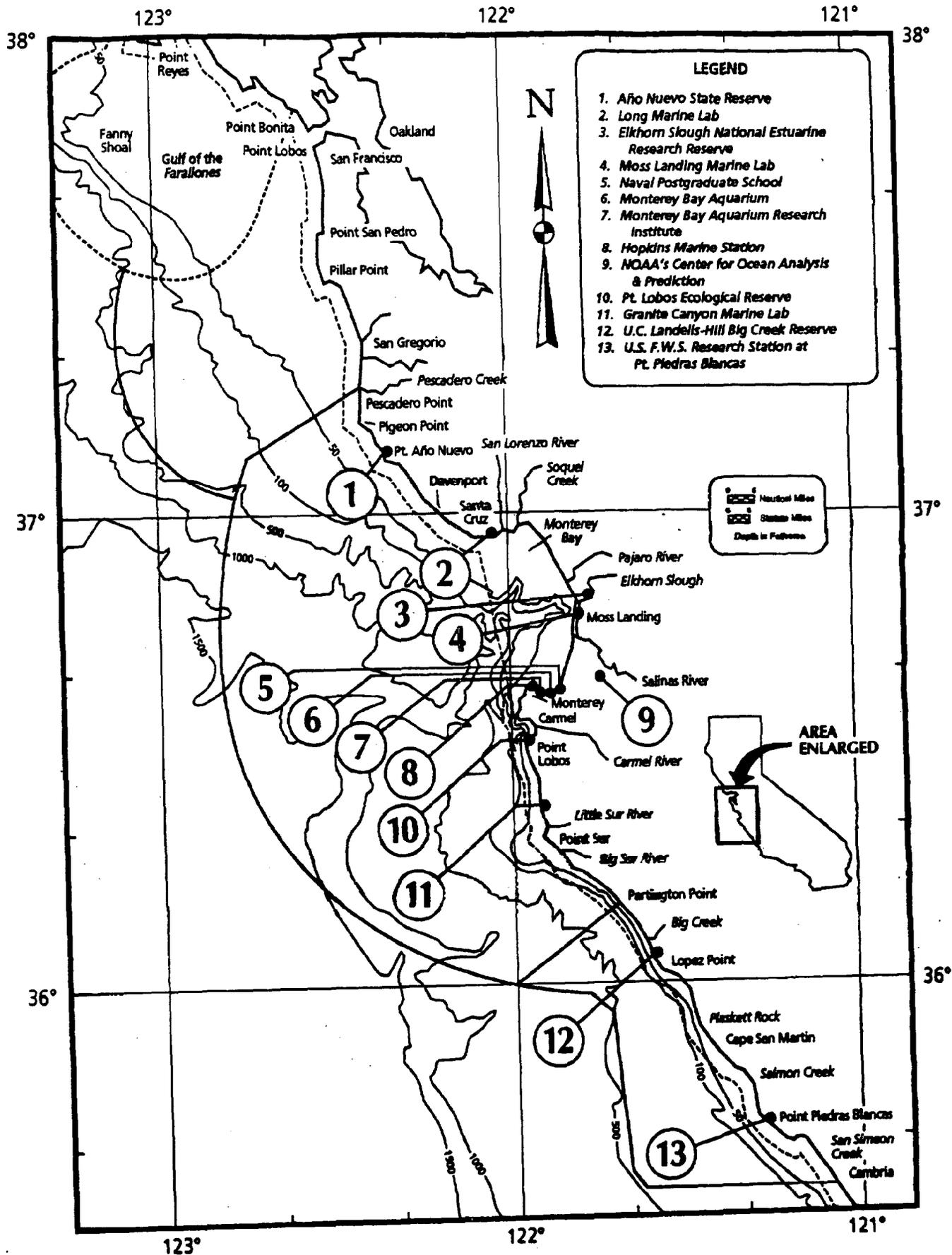


Figure 21. Research and Education Facilities in the Monterey Bay Area.

in Pacific Grove. The main research effort is in using intertidal organisms to study cellular and developmental biology, immunology, and neurobiology. Research is also conducted on the ecology of the rocky intertidal zone of the Hopkins Marine Life Refuge located offshore of the laboratory.

The Naval Postgraduate School is operated by the U.S. Navy in Monterey. Research is conducted exclusively on physical oceanography. The school shares access to the research vessel maintained by Moss Landing Laboratories.

NOAA's Center for Ocean Analysis and Prediction, located in Monterey, adjacent to numerous State facilities, assists in the distribution of NOAA's ocean and atmospheric data to local users at universities as well as other State and Federal agencies.

Moss Landing Marine Laboratories of San Jose State University conducts research in many fields, e.g., oceanography, geology, invertebrates, ichthyology, marine algae, and marine mammal and seabird behavior. The Laboratory facilities, located at Moss Landing, were destroyed in the recent Loma Prieta earthquake. Their activities are being continued at a temporary location in Salinas. The Laboratories operate the R/V Point Sur for research cruises.

The Elkhorn Slough National Estuarine Research Reserve (NERR), managed in partnership between the Federal Government (NOAA's Sanctuaries and Reserves Division) and California's Department of Fish and Game, is one of eighteen such sites in the Nationwide NERR system. Elkhorn Slough NERR is managed to provide a natural

outdoor laboratory setting that attracts researchers from all fields of oceanography and limnology. Information gained from the research is provided to local, state and Federal decision-makers to assist in the management of the Nation's coastal zone.

In addition, trained volunteers as well as CDF&G staff lead interpretive walks through Elkhorn Slough NERR trails on the Reserve showing the diverse habitats and organisms of a productive salt-marsh ecosystem.

The Long Marine Laboratories and the Institute of Marine Sciences of the University of California at Santa Cruz conducts research on cetaceans, pinnipeds (especially at Año Nuevo), sea otters, invertebrates, and plankton.

Granite Canyon Marine Laboratory of the California Department of Fish and Game is located on the Big Sur coast. In addition to its involvement in mariculture research, it is presently conducting two large studies in marine toxicology. The Marine Bioassay Project is developing sensitive tests using marine species for evaluating the toxicity of municipal/industrial effluents. The Oil Spill Cleanup Agent or Dispersant Toxicity Project is evaluating the toxicity and toxicological properties of oil spill dispersant, utilizing sensitive marine life forms (Michael Martin, pers. comm., 1989).

The Monterey Bay Aquarium is operated by a non-profit foundation, and not only displays some of the best marine aquarium facilities in the world but also conducts a variety of research through their Research Division. Research is primarily focused on

the natural nearshore habitats of the Bay, especially the kelp forest communities and sea otters.

The Monterey Bay Aquarium Research Institute was incorporated in May 1987. It is planning an extensive research project to study the Monterey Submarine Canyon. It will use the R/V Point Lobos to launch a remote-operated unmanned submarine to explore the deep waters of the canyon (S. Webster, personal communication, 1989).

The University of California Landels-Hill Big Creek Reserve in Big Sur, south of Julia Pfeiffer Burns State Park is part of a UNESCO international Biosphere Reserve, and protects and manages the lower portion of the 25 square mile Big Creek watershed. Limited research and educational programs are provided at the facility. The staff is now considering establishment of a permanent ecological refuge analogous to that at Point Lobos or the Bodega Marine Laboratory.

Finally, the U.S. Fish and Wildlife Service maintains a small research station at Point Peidras Blancas and conducts frequent surveys of sea otters and seabirds that concentrate at Point Piedras Blancas.

Extensive marine and coastal education and interpretive efforts complement Monterey Bay's many research activities. For example, over 7 million visitors, assisted by 500 volunteer guides trained in interpreting the marine environment, have experienced the interpretive exhibits of the Monterey Bay Aquarium since it opened in fall of 1984. Over 70,000 school children participate in aquarium education programs each year (J. Packard, personal

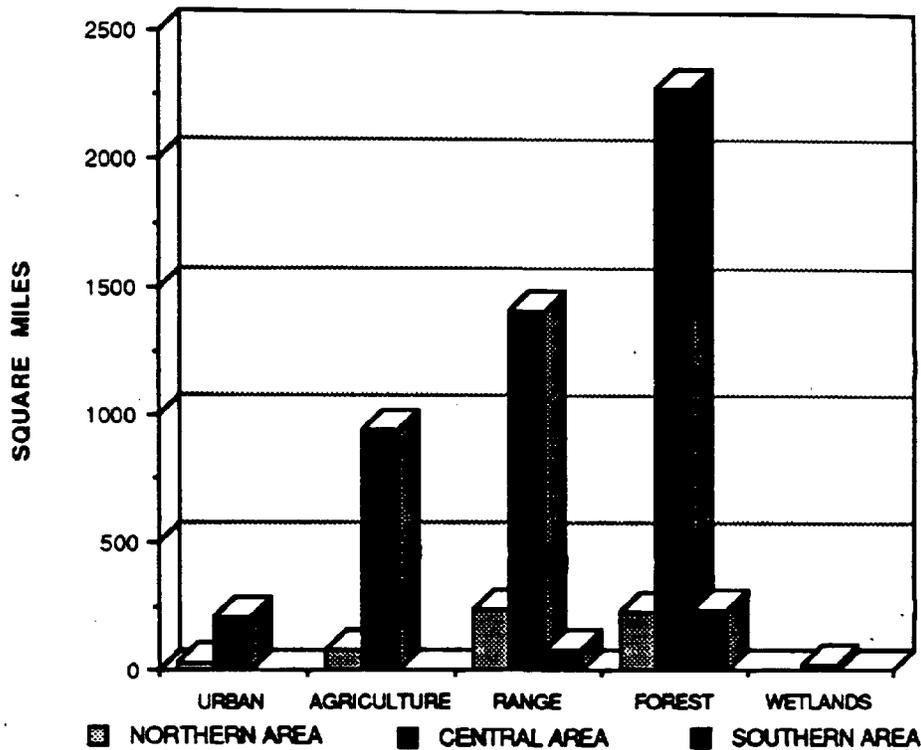
communication, 1989). A number of other institutions have highly successful interpretive programs as well. For example: Pt. Lobos Ecological Reserve, Elkhorn Slough National Estuarine Research Reserve, Long Marine Laboratory and Año Nuevo State Reserve all have excellent docent programs serving the public, and marine related programs for school groups and teachers (J. Packard, personal communication, 1989). In addition, marine related post-secondary and/or postgraduate education is available through three local colleges: the University of California Santa Cruz; Moss Landing Marine Laboratories and the Naval Postgraduate School.

The soon to be completed Stanton Center will provide a new major Maritime and History Center in Monterey. The Stanton Center will house priceless historical artifacts, interesting and informative exhibits, history film and heritage education programs for both children and adults and in general increase the public's awareness of the importance of this Nation's maritime heritage.

G. Land Use

The majority of land adjacent to the Sanctuary study area is undeveloped forest and range land although large areas are used for agriculture in the central portion of the study area (Figure XX). The southern portion of the study area is composed entirely of undeveloped range and forest land including the Los Padres National Forest. Major urban centers are found in the central portion of the study area at Monterey, Moss Landing and Santa Cruz. To the north, Princeton, Pacifica and portions of San Francisco lie adjacent to the coast.

**LAND USE FOR COASTAL WATERSHEDS, BY
COUNTY, ADJACENT TO WATERS CONSIDERED
FOR THE MONTEREY BAY NATIONAL MARINE SANCTUARY**



Source: Based on U.S. Geological Survey Land Use/Land Cover Data Base, circa 1975 - 1980. West Coast Land Use Data for National Coastal Pollutant Discharge Inventory Counties data base, 1988. Strategic Environmental Assessment Division, Office of Ocean Resources Conservation and Assessment, National Ocean Service, Rockville, Maryland.

LAND USE BY COUNTY AND U.S. GEOLOGICAL SURVEY CATALOGUE UNIT ADJACENT TO WATERS
CONSIDERED FOR THE MONTEREY BAY NATIONAL MARINE SANCTUARY

AREA	CATALOGUE UNIT	COUNTY	URBAN	AGRICULTURE	RANGE	FOREST	WETLANDS	TOTALS	
(LAND USE IS IN SQUARE MILES)									
NORTH	18050005	MARIN (1)	6.1	56.7	117.1	117.1	2.9	299.9	
		TOTAL	6.1	56.7	117.1	117.1	2.9		
		18050006	SAN MATEO	16.2	10.1	110.1	101		0.5
			SAN FRANCISCO	11.1	0	0.3	0		0
CENTRAL	18060001	SANTA CRUZ	57.5	6.5	19.2	263.4	0.4	378	
		TOTAL	57.5	6.5	19.2	263.4	0.4		
		18060002	SAN BENITO (2)	1	96	119	230		0
			SANTA CLARA	12.6	63.1	92.3	198.6		0
SOUTH	18060006	MONTEREY	2	10.8	1.8	2.2	0	904.5	
		TOTAL	29.2	202.6	225.2	447.2	0.3		
		18060011	MONTEREY	35.7	86.1	44.6	46.2		3.1
			SAN BENITO (2)	0.8	1.5	6.5	6		0
SOUTH	18060012	TOTAL	36.2	87.6	51.1	52.2	3.1	230.2	
		TOTAL	38	4.9	59.1	206.9	0.7		
		18060005	MONTEREY	27.3	422.3	906.2	894.2		18.2
			SAN LUIS OBISPO	24.5	200.6	147.2	455.5		0
SOUTH	18060006	SAN BENITO (2)	0	12	0	12	0	3062	
		TOTAL	51.8	634.9	1055.4	1301.7	18.2		
		SUB-TOTAL	212.7	945.2	1419.8	2283.7	22.9		
		GRAND TOTAL	248.5	1013.2	1730.2	2745.5	26.4		5763.8
SOUTH	18060006	MONTEREY (3)	2.3	1.2	62.9	236.5	0.1	325	
		TOTAL	2.3	1.2	62.9	236.5	0.1		
		SUB-TOTAL	2.3	1.2	62.9	236.5	0.1		
		GRAND TOTAL	248.5	1013.2	1730.2	2745.5	26.4		5763.8

(1) THE MAJORITY OF LAND USE IS ADJACENT TO THE GULF OF THE FARALLONES NATIONAL MARINE SANCTUARY.
 (2) ESTIMATED VALUES.
 (3) INCLUDES A SMALL PORTION OF SAN LUIS OBISPO COUNTY/NOTE ALSO A SMALL PORTION IS WITHIN THE CENTRAL AREA.
 ALL VALUES IN SQUARE MILES
 DATA OBTAINED FROM NATIONAL OCEAN SERVICE, OFFICE OF OCEAN RESOURCES, CONSERVATION AND
 ASSESSMENT, STRATEGIC ENVIRONMENTAL ASSESSMENT DIVISION

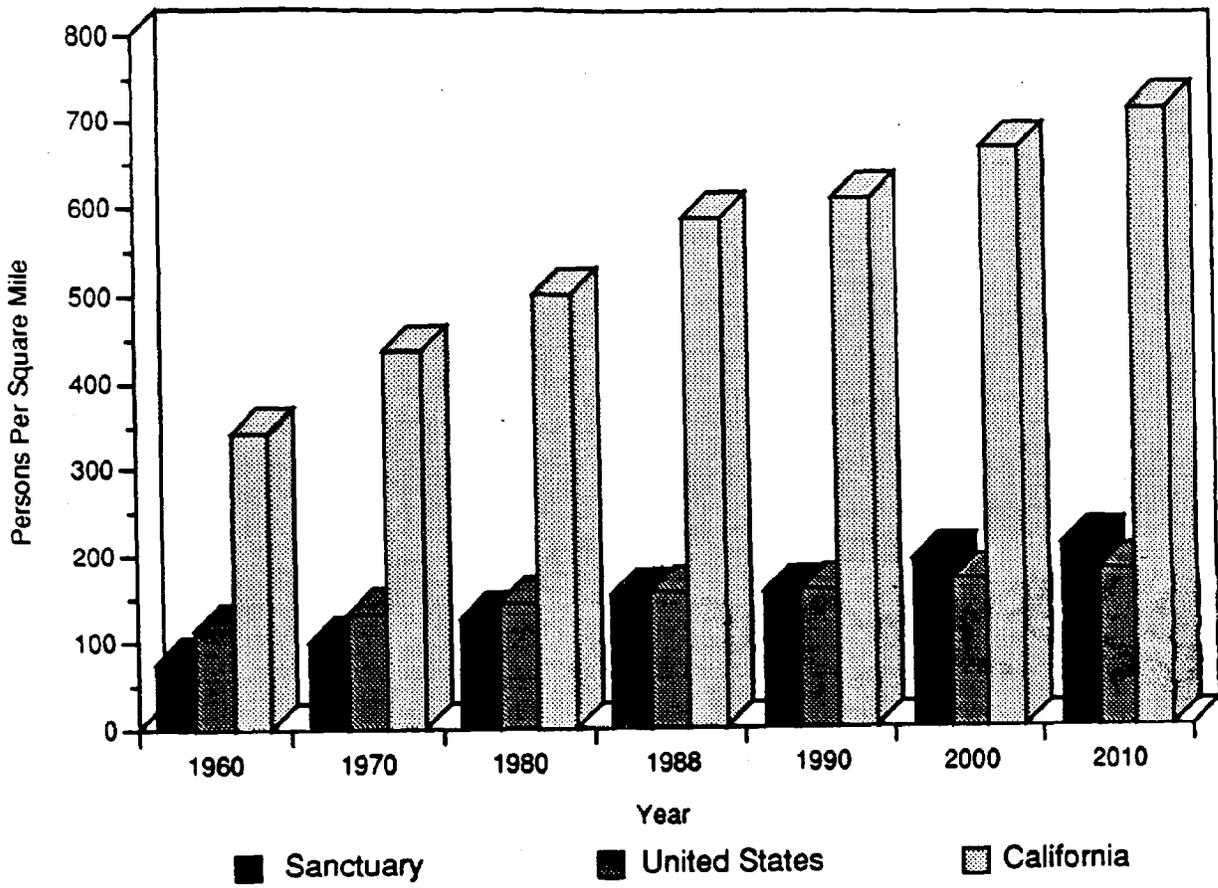
Commercial agriculture is an important activity in the land surrounding the bay primarily within the watersheds draining into the central portion of the study area. Agriculture includes both irrigated and non-irrigated agriculture as well as semi-agricultural land uses (e.g. dairies, and feedlots). Monterey County was once known as "The Salad Bowl of the World" because of the wide variety of vegetables grown there.

Monterey county alone produces 90 percent of U.S. artichokes, 60 percent of its broccoli, 50 percent of its cauliflower and mushrooms, 25 percent of its celery, and up to 80 percent of its lettuce (Monterey County Agriculture, Food for Thought, 1988). Santa Cruz County agricultural production includes berries, fruits, nuts, vegetables, field crops (hay and pasture), nursery crops, and products from the apiary, poultry, and cattle industry. Strawberries were the most valuable crop in 1988 with a total value of 58 million dollars. Lettuce was the second most valuable at 18 million dollars, followed by roses (16 million), apples (14 million), and raspberries (almost 14 million). Total agricultural production for 1988 was 166 million dollars.

H. Coastal Development

The major population centers within the adjacent coastal counties to the study areas are growing steadily (Figure xx). Both commercial and residential unit development is concentrated in the central portion of the study area. Large growth has occurred in places such as Monterey, Marin, Salinas, Santa Cruz, and

Figure X. Population Density in Coastal Counties, 1960 - 2010



Watsonville located along or adjacent to Monterey Bay. Almost 3,800 new homes were constructed every year in Monterey and Santa Cruz Counties between 1970 and 1989. Development was greatest in the early 1970s, late 1970s and mid 1980s.

Associated with this development are increases in the need for seawalls to protect coastal property and facilities to gain access to the ocean such as docks, piers and jetties. In addition to direct physical changes to the coastline there are the indirect effects of this increased growth in terms of additional discharges and deposits via non-point source surface runoff or via groundwater and additional demands on point source discharges from sewage treatment plants.

I. Recreational Activities and Tourism

The moderate climate, rich diversity of marine flora and fauna, and variety of coastal types present many recreational opportunities for residents and tourists alike. The area is internationally renowned for its aesthetic beauty and recreational opportunities. The recreation industry is worth approximately \$641 million/year to San Mateo, Monterey and Santa Cruz Counties (Central Coast Regional Studies Program, Economic Values of the Central Coast, 1989).

1. Tourism

Monterey Bay has been a tourist attraction since the late 1800's. About 18 million tourists visit the area annually (AMBAG, 1978). The total number of tourists to Santa Cruz annually is 2.5

million (Santa Cruz County Conference and Visitors Council, pers., comm, 1989). There were about 1.7 million overnight visitors to Monterey Peninsula in 1988 (Monterey Peninsula Chamber of Commerce, pers. comm., 1989). The primary recreational activities are sportfishing, boating, hiking, skindiving, sightseeing, nature observation, and surfing.

Many existing attractions are open to the public. The Monterey Bay Aquarium opened in 1984 and currently attracts about 1.6 million visitors annually (S. Webster, per. comm., in Heimlich - Boran, 1988).

2. Coastal Recreation Areas

Shoreline and nearshore recreation occurs throughout the bay area, with concentrations from Point Lobos to Santa Cruz ~~Woods~~. Almost all of these sites are managed by the state or local governments. Most of these sites are recreational beach areas and/or marinas providing access to Monterey Bay. The numerous public beaches account for 45 miles of coastline bordering the preferred boundary alternative.

The numerous protected areas of special environmental significance allow varying levels of public use. These include the Point Lobos Ecological Reserve, the Carmel Bay Ecological Reserve, the Año Nuevo State Reserve, the Pacific Grove Marine Garden Fish Refuge, the Hopkins Marine Life Refuge, and the California Sea Otter Game Refuge. The Año Nuevo State Reserve attracts over 140,000 visitors annually (Coastal Concern, 1989).

3. Recreational Boating

Recreational boating activities originate primarily in the harbors of Santa Cruz, Monterey, and Moss Landing. Each harbor has a marina servicing recreational boaters, commercial fisherman, and partyboat charters. Approximately 2,100 boat slips are available in these harbors. All the marinas are full and have long waiting lists. Five boat ramps, one at Santa Cruz, and two each at Moss Landing and Monterey, are available for launching small boats from trailers. The boat ramp at Santa Cruz was used to launch approximately 8,000 boats in 1987 (Santa Cruz Port District, 1987). Overnight berths are available in the marinas for transient boaters. Recently a para-sailing company has begun to operate out of Santa Cruz. Once a year large speed boats participate in a charity race exceeding speed of 100 mph.

4. "Personal water craft"

The use of smaller speed vessels, termed "personal water craft", such as jet-skis or mini-motorboats has begun to become a highly popular sport.

Personal water craft are a relatively new form of water sport and while their popularity is increasing, they are currently operated in small numbers in the Monterey Bay area. In the northern part of the Bay, primarily around Santa Cruz, it is estimated that 12-16 vessels per day are operated on weekends during the summer months (6-month period, with 6-8 vessels operating on weekdays. During the winter only 6 vessels operate on weekends and 1-2 during the weekdays. The vessels are launched and recovered at a launch ramp in the Santa Cruz harbor area.

In the central portion of the Bay, primarily Moss Landing/Elkhorn Slough area, it is estimated that "dozens per month" operate during the summer. The vessels are launched and recovered at a launch ramp near the Yacht Club in the harbor area and have been seen to travel the length of Elkhorn Slough.

In the southern portion of the Bay, there are no estimates of vessel use but they are known to be on the increase. Vessels which are launched and recovered at the Coast Guard Pier launch ramp, are prohibited from the Monterey Marine area. There has been an increase in concern over the use of these vessels in the vicinity of local beaches, where the operators desire to ride the surf and jump waves. An ordinance is being considered to prohibit use of the so-called "thrill craft" in the "Window of the Bay" area of Monterey.

5. Recreational Fishing

Recreational fishing is a very popular activity both in Monterey Bay and the exposed coastal areas throughout the entire study area. Five major types of recreational fishing are pursued: private boat or skiff fishing, partyboat fishing, spearfishing, pier and shore (surf) fishing, and shellfishing. Skiff fishing is limited almost entirely to sheltered Monterey and Carmel Bays. Most of the skiff catch is made up of white croaker, several species of rockfishes, Pacific sanddab, lingcod, and mackerel (Table x). The rugged nature of some sections of the coast make shorefishing impossible. Where the shoreline can be reached there is excellent rocky-shore fishing for lingcod, kelp greenling,

cabezon, surfperch, and rockfishes. Most sandy beaches offer good surf fishing for surfperches and flatfishes (Table x). Pier fishing is available on the public piers in Monterey, Seacliff State Beach, Capitola, and Santa Cruz. Jetties at Moss Landing harbor and Santa Cruz Small-Craft harbor provide good fishing for surfperch, starry flounder, and rockfishes. Table x also shows the main fish species caught from piers and jetties. Surf smelt and night smelt are netted in the surf off sandy beaches during certain months of the year.

Partyboats operate primarily out of Monterey, Moss Landing, and Santa Cruz harbor; a total of 25 were operating in 1987. The Big Sur coast is a very popular partyboat fishing area (Table x). Salmon, lingcod, mackerel, and many varieties of rockfish are the main species caught.

6. Intertidal Collecting

Clam digging in ocean waters has been all but eliminated because of sea otter foraging, while other shellfish such as limpets and mussels are harvested from rocky tidepools. Abalone were once collected on rocky shore areas but their numbers have dwindled from overharvesting and sea otter predation.

7. Diving

The Monterey Bay area is well known for recreational diving. The area from Cannery Row on the Monterey Peninsula to Point Lobos State Underwater Reserve is the most popular diving area in all of central and northern California. More than 70 percent of all diving between Point Conception and Oregon occurs in this area

Table 8. ²

Major Species of Fish Caught from Private or Rental Boats, Beaches, Piers and Jetties (Marine Recreational Fisheries Statistics Survey, 1987).

Private or Rental Boats

Blue rockfish
 Pacific sanddab
 Rockfishes (general)
 Longfin sanddab
 Lingcod
 Gopher rockfish
 Albacore tuna
 Yellowtail rockfish
 Chilipepper
 Brown rockfish

Piers

Staghorn sculpin
 Jacksmelt
 White croaker
 Pile perch
 White seaperch
 Surfperches
 Lingcod
 Chinook salmon
 Rainbow trout
 Kelp rockfish

Beaches

Barred surfperch
 Staghorn sculpin
 Flatfishes
 Surfperches
 Calico surfperch
 Senorita
 Silver surfperch
 Walleye surfperch
 Black perch
 Rockfishes (general)

Jetties

Surfperches
 Rockfishes (general)
 Staghorn sculpin
 Northern sculpin
 Pile perch
 Rainbow seaperch
 Senorita
 Starry flounder
 Cabezon
 White croaker

Table 2. ¹³ Fish Caught by Commercial Partyboat Fleet For the Ports of Monterey, Moss Landing, and Santa Cruz (California Department of Fish and Game, 1987)

<u>Species</u>	<u>Number of Fish Caught</u>
Rockfish (unspecified)	373,849
Salmon (all species)	12,755
Lingcod	11,133
Pacific mackerel	4,162
Sablefish	3,208
Jack mackerel	1,773
Flatfish (unspecified)	1,024
Cabazon	390
Albacore tuna	318
Sanddab	236
Whitefish, ocean	100
White croaker	64
Pacific bonito	27
California halibut	17
Petrale sole	4
White seabass	1
Sturgeon	1
All Others	<u>9,253</u>
Total	418,978

Note: Total based on 45,461 anglers fishing from 25 boats in 1987.

(U.S. Department of the Interior, 1987). Other underwater parks popular with divers include Carmel Bay State Underwater Park and Julia Pfeiffer Burns State Underwater Park (McMillon, 1982). Rosenberg (1987) presents an excellent guide to diving in the Northern California and Monterey Peninsula area.

8. Nature Observation

Opportunities for nature observation include whale watching, viewing seabird nesting and roosting sites, and observing marine mammal pupping and haul-out areas. Partyboats are used for nature observation tours, including watching blue whale and migrating California gray whales. One company (Shearwater Journeys), which offers natural history boat trips, takes over 3,000 people each year out on Monterey Bay to view seabird and marine mammals (Sheila Baldrige, pers. comm., 1989). Rocky shorelines provide the hiker with the opportunity to view the fascinating flora and fauna associated with the rocky intertidal habitats.

A seaplane operation at the Santa Cruz Municipal wharf provides nature observers opportunities to watch whale migrations from the air as well as provide emergency rescue service when necessary.

9. Surfing

Surfing is a popular activity throughout the bay area, especially at Pacific Grove, Moss Landing, Asilomar Beach, the mouth of the Big Sur river, and Santa Cruz. Throughout the entire study area there are 4 major sites in South Mateo County (south of Half Moon Bay), 32 in Santa Cruz County, 10 around the Monterey

peninsula and 6 in Big Sur. Surfing accounts for a major source of revenue to the area (approximately \$150 million per year to Santa Cruz alone) and special events such as the six day O'Neil Cold Water Classic ProSurf contributes \$ 2.0 million alone. The main surfing season runs from late summer through early spring, although surfing continues year round (J. Young, pers. comm., 1989). Santa Cruz has been a major surfing area since the turn of the century. Its long history is traced in the Santa Cruz Surfing Museum. Wind surfing has also increased in popularity in the last few years with major competition located in the small bay south of Año Nuevo.

IV. Section: Existing Resource Protection Regime

A. Introduction

The Federal agencies with existing primary responsibilities in the Monterey Bay study area are: the National Marine Fisheries Service (NMFS) of the Department of Commerce; the Environmental Protection Agency (EPA); U.S. Fish and Wildlife Service (FWS) and the Minerals Management Service (MMS) of the Department of the Interior; the Corps of Engineers (COE), the Department of the Army and the Department of the Navy of the Department of Defense; and the U.S. Coast Guard (USCG) of the Department of Transportation.

The California state agencies with existing primary jurisdiction in the Monterey Bay study area are: the Coastal Commission, the State Water Resources Control Board, the Central and San Francisco Regional Water Quality Control Boards, the State Lands Commission, the Department of Fish and Game, the Department of Parks and Recreation, the Air Resources Board and the Historical Resources Commission.

This section will review briefly the responsibilities of these agencies in the Monterey Bay area. Additional information is provided in Appendix C.

B. Federal Authorities

The NMFS works with the CDF&G, under the Magnuson Fishery Conservation and Management Act, on approving and enforcing Fishery Management Plans (FMPs) prepared by regional fishery management councils. Through a cooperative enforcement agreement, the CDF&G is also deputized to enforce FMPs beyond three miles from the

State's coastal baseline.

NMFS shares responsibility with the FWS for implementation of the Marine Mammal Protection Act and the Endangered Species Act. The protection of cetaceans and pinnipeds is the responsibility of NMFS. The FWS is responsible for protecting endangered bird species and some marine mammals (such as the southern sea otter and walrus). Three of these bird species: the California brown pelican, the American peregrine falcon, and the California least tern, are found in the vicinity of Monterey Bay as well as the majority of the entire population of southern sea otter. The short-tailed albatross is extremely rare in this area but was recently sighted off central California in the vicinity of the Cordell Bank National Marine Sanctuary.

The USCG, in addition to its enforcement of fishing regulations, is responsible for enforcing regulations under the Clean Water Act (CWA) and the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) to prevent pollution caused by discharges from vessels of oil, hazardous substances, or other pollutants. The USCG is also responsible for regulating vessel traffic, maintaining boater safety, and coordinating search and rescue operations.

The EPA has regulatory responsibilities with regard to sewage outfalls, and ocean dumping. Sewage outfall regulation is governed under the Clean Water Act (CWA) via the National Pollutant Discharge Elimination System (NPDES), administered by the EPA. Under the NPDES program, a permit is required for the discharge of

any pollutant from a point source into the navigable waters of the United States, the waters of the contiguous zone, or ocean waters. Within California state waters, EPA has delegated NPDES permitting authority to the State government. Title I of the Marine Protection, Research, and Sanctuaries Act prohibits the transportation of any materials from the United States for the purpose of dumping them into the territorial sea, the contiguous zone, and the ocean beyond without a permit from EPA.

The COE grant permits that are based on EPA guidelines for the discharge of dredged materials into State waters. The COE has sole jurisdiction over marine construction, excavation or fill in any navigable waters of the United States.

Pursuant to the Rivers and Harbors Act, a permit must be obtained from the COE prior to any marine construction, excavation or fill activities in any navigable waters of the United States (33 U.S.C. § 403). The COE may refuse to issue permits on the basis of a threat to navigation or potential adverse effects on living marine resources.

The MMS is responsible for the overall management of offshore oil and gas exploration and development operations in accordance with the provisions of the Outer Continental Shelf Lands Act (OCSLA). These include enforcement of regulations pursuant to the OCSLA (30 C.F.R. Part 250) and the stipulations applicable to particular leases discussed above. This responsibility was formerly divided between the Bureau of Land Management and the U.S. Geological Survey.

The United States Department of Defense maintains numerous training areas in the area and routine training missions are frequently conducted by all branches of the armed services.

C. State Authorities

The California Coastal Act of 1976 (the CCA) is the foundation of the California Coastal Management Program. The CCA establishes the State Coastal Commission to implement the Act, granting it permit authority until such time as local governments adopt local plans approved by the Commission. It establishes a comprehensive set of specific policies for the protection of coastal resources and the management of orderly economic development throughout the coastal zone. The CCA defines the coastal zone as the land and water area of the State, extending seaward to the outer limit of the State's jurisdiction, including all offshore islands, and extending inland generally 1,000 yards from the mean tide line. In significant coastal, estuarine, habitat, and recreational areas, it extends inland to the first major ridge line or 5.0 nm (8.0 km) from the mean high tide, whichever is less.

The State Lands Commission has jurisdiction over all state owned lands and submerged lands extending 3.0 nm (5.6 km) from the mean high tide line. Administration of State lands includes leasing of these lands for various legislatively authorized purposes; in particular, oil and gas exploration and development. In addition, as the State agency with sole responsibility for administering the trust, the SLC has adopted regulations for the

protection and use of public trust lands in the coastal zone.

The CDF&G is responsible for enforcing California as well as Federal fishing laws in the 200-mile wide exclusive economic zone as well as in State waters of the territorial sea. The CDF&G also works with other Federal and State agencies with water quality projects and environmental reviews.

In order to protect special marine resources and water-based recreational values in ocean waters within state jurisdiction and to expand coastal park units beyond the water's edge, the California Department of Parks and Recreation (CDP&R) has established an Underwater Parks Program which is managed in conjunction with CDF&G. CDP&R also shares responsibility with the National Forest Service for management of the Los Padres National Forest.

The Porter-Cologne Water Quality Control Act is designed to enhance and maintain water quality in State waters, including ocean waters, under the jurisdiction of the State. The State Water Resource Control Board (SWRCB) and the nine regional water quality control boards (RWQCB) have primary authority for regulating water quality in California. The authority to administer the NPDES permits has been delegated by EPA to the SWRCB and by the State to the Regional boards.

The California Air Resources Board (ARB) is charged with the maintenance and enhancement of the ambient air quality of the State. The ARB has set air quality standards designed to meet National Ambient Air Quality Standards and delegated their

implementation to local Air Pollution Control Districts (APCDs).

State preservation of representative and unique archaeological, paleontological, and historical sites in the land and water areas of the state is the responsibility of the California Historical Resources Commission. The Commission evaluates and makes recommendations to the State Historic Preservation Officer on nominations to the National Register. The Commission also recommends state registration of sites as landmarks and points of interest to the Resources Agency which is responsible for maintenance of registered sites.

ALTERNATIVES

Alternatives Including the Preferred Alternative

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PART III: ALTERNATIVES, INCLUDING THE PREFERRED ALTERNATIVE

In evaluating the proposal to designate a Monterey Bay National Marine Sanctuary (MBNMS), the National Oceanic and Atmospheric Administration (NOAA) has analyzed institutional, boundary, regulatory and management alternatives in terms of achieving optimum protection of the ecosystem, improving scientific knowledge of the area, and promoting public understanding of the value of Monterey Bay area resources and qualities. This Part describes the alternatives considered in the evaluation process. Part IV describes the environmental consequences of the alternatives described below.

The fundamental choice of alternatives is between the two institutional alternatives: (1) no action or continuing the status quo, and (2) the preferred alternative, Sanctuary designation as a complementary measure to existing programs. Boundary, regulatory, and management alternatives are considered in the context of the preferred institutional alternative.

I. Section: Boundary Alternatives

A. Introduction

This section describes the seven proposed boundary alternatives for the Monterey Bay National Marine Sanctuary. The study area for the proposed sanctuary (also included as Boundary Alternative 5) encompasses an area of 4,095 square nautical miles. The northern range of the alternatives extends to the Golden Gate National Recreation area in Marin County. The southern range extends to Cambria in San Luis Obispo County. Five of the boundaries extend approximately 46 nautical miles seaward from Moss Landing and approximately 18 nautical miles from the California coast. Depths of over 1,500 fathoms are included in all but one of the alternatives. All of the boundaries include Monterey Bay and its adjacent coastline to the north and the south. They also include state waters between Pigeon Point to the north, and Partington Point to the south. Comprehensive tables follow each boundary description and map, graphically illustrating the resources and human uses contained in each boundary alternative.

All boundary alternatives were derived based on: (1) the distribution of living resources and human uses, (2) geological and physical oceanographic parameters, and (3) management logistics which provide for effective resource protection and enforcement, improve research on the Monterey Bay environment, and enhance public awareness and understanding of the resources and uses of the Sanctuary area.

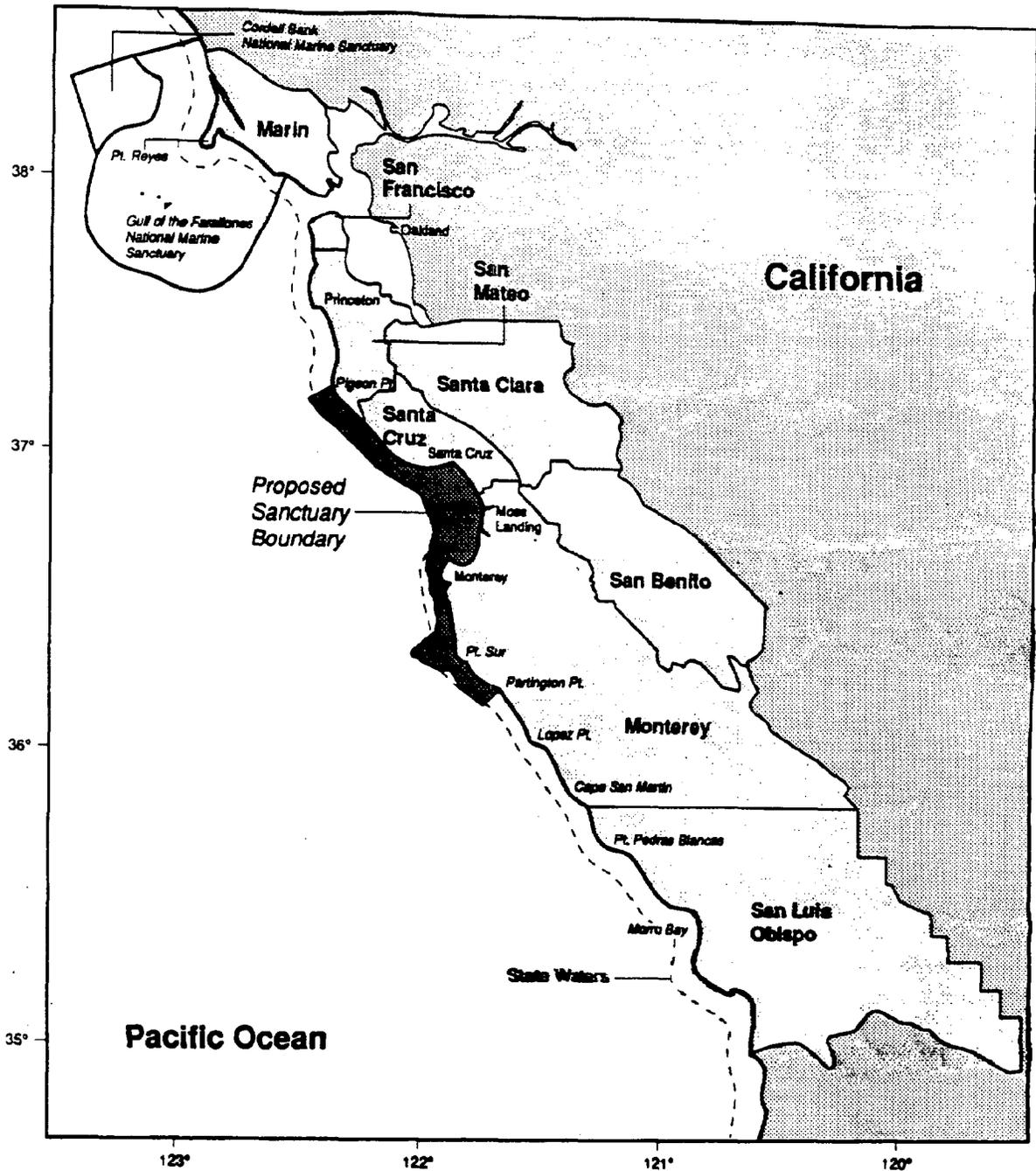
B. Boundary Alternative 1

1. Geography

The boundary extends from the mean high tide level at Pigeon Point on a southwest heading of 240° to the 50 fathom isobath (Figure XX). Following this isobath south to a point where it intersects the 3 mile geographic limit drawn from the baseline across Monterey Bay, the boundary then turns south along this limit. Upon reaching the 100 fathom isobath on the Sur platform, the boundary then runs generally to the southeast along the 100 fathom isobath. The boundary then proceeds to the head of Partington Canyon until it rejoins the 3 mile limit. Following the three mile limit until it reaches a point three miles off Partington Point on a heading of 240°, the boundary then proceeds shoreward to the mean high tide level. The land-side boundary follows along the mean high tide level, but Santa Cruz, Moss Landing (except for Elkhorn Slough), and Monterey Harbors are all excluded from this alternative's boundaries.

2. Distinguishing Characteristics

This boundary focuses on nearshore coastal resources and uses. Consequently high percentages of kelp, intertidal invertebrates, and sea otters are located here (Table X). The area contains a high concentration of fissipeds (otters), particularly in the southern portion, a major concentration of pinniped (seal) colonies/rookeries (equal to Alternatives 2, 6, and 7), and several cetacean sighting areas. However, feeding areas associated with the offshore canyon are excluded. Deep water fish associated with the offshore canyon are also excluded from this proposed alternative. This alternative encompasses only 11 percent of the canyons (excluding deep sea portions) in the study area. Water quality stations, protected areas, freshwater input, and kelp beds are the same as in Alternatives 2, 6, and 7. Due to the limited amount of Federal OCS lands encompassed, this boundary alternative contains only 80 billion barrels of oil and 110 billion cubic feet of natural gas (Table X). Lands adjacent to the sanctuary are home to three major ports. Commercial ship traffic is often outside of the proposed boundary alternative due to its limited seaward extent. Only two military training areas, adjacent to the coast of Monterey Bay itself, are included.



- Boundary Alternative 1 establishes a Sanctuary of 502 square nautical miles
- It borders 171 nautical miles of shoreline
- Federal and state waters account for 22 percent and 78 percent, respectively, of the proposed Sanctuary

**Boundary Alternative 1
Summary of Resources**

Category/ Subcategory	Units	Amount	Percent of Total within Boundary Alternative										Comments
			10	20	30	40	50	60	70	80	90	100	
Existing Protected Areas													
Parks	number of sites	8											Includes state historic parks.
Refuges	-	3											
Reserves	-	4											
TOTAL	-	15											Data are for Monterey and Santa Cruz counties.
ASBS	-	5											ASBS sites are also classified as state parks, refuges, or reserves.
Biological													
Invertebrates	number of phyla	31											Includes ASBS areas plus Asilomar and Pt. Sur.
	no. comm. imp. species	19											
	no. high concn. areas*	7											
Fish	number of species	240											Only boundary without deep water fish. Area has lowest percentage of rockfish habitat.
	% rockfish habitat	10											
	% squid spawn. habitat	36											
Turtles	number of species	4											Listed species are not normally residents of zone.
Seabirds	number of species	94											
	no. of rookeries/colonies	13											
	% high concn. areas	18											
Flapping	number of individuals	746											Inhabits narrow zone of coastal waters.
	range (nautical miles)	87											
Pinnipeds	number of species	5											Excludes occasionally stranded Guadalupe Seals.
	no. of rookeries/colonies	7											
	% high concn. areas	15											
Cetaceans	number of species	20											Concentration only includes gray whales, dolphins, and porpoises.
	% high concn. areas	22											
Physical/Chemical													
Upwelling Zones	number	2											Offshore of Pt. Sur and Ano Nuevo.
Freshwater Input	cubic feet per second	1,046											
Water Quality													
Monitoring Stations	number	75											Criteria measured includes cadmium, which is often measured in high concentration due to natural sources.
Exceeding Criteria	number stations	38											
Habitats													
Canyon	square nautical miles	72											Alternative with smallest area of canyon.
Kelp	nautical miles	105											
Wetlands	square miles	23											
Historical													
Shipwrecks	number of sites	109											Sites reported, not all verified. Only 1 offshore. Sites were recorded and verified.
Prehistoric	-	475											

Bars are rounded to the nearest 10 percent

*within intertidal zone

Abbreviations: altern.-alternative; ASBS-areas of special biological significance; comm.-commercially; concn.-concentration; imp.-important; no.-number; spawn.-spawning; w/i-within.

**Boundary Alternative 1
Summary of Human Uses**

Category/ Subcategory	Units	Amount	Percent of Total within Boundary Alternative										Comments
			10	20	30	40	50	60	70	80	90	100	
Commercial Fishing													
Fishing Vessels	number	755											Includes parts of Monterey, Moss Landing, and Santa Cruz.
Rockfish	thousand dollars	2,115											
Salmon	"	2,017											
Total Value of all Fish	"	9,831											
Vessel Traffic/Dredging													
Commercial Shipping	vessels/year	2,500											Does not encompass any traffic 10 mi. or more from shore. Excludes fishing vessels and 1 mil. cu. yds. per year of dredged and disposed sand off of Golden Gate or vessels heading north from San Francisco Bay area.
Dredge Disposal	cubic yards/year	50,000											
Dredging	cubic yards/year	182,000											
Development													
Residential	units/year	3,794											The average rate of development between 1970 and 1988. Population and development are greatest in communities along the coast. Includes Monterey and Santa Cruz counties.
Commercial	buildings/year	202											
Population	thousand persons	585											
Energy/Mining													
Oil	million barrels	80											Includes the same amount of oil and gas resources as in Boundary Alternative 7.
Natural Gas	billion cubic feet	110											
Sand Mining	cubic yards/year	150,000											
Adjacent Land Use													
Urban	square miles	213											Urban lands are concentrated in population centers clustered around Monterey Bay. Rangelands, forest lands, and agricultural lands are greatest in the southern portion of the boundary alternative.
Range	"	1,420											
Forest	"	2,284											
Agriculture	"	945											
Public Recreation													
Ocean-Adjacent Areas	number	38											Boundary Alternatives 1 and 7 have the lowest number of ocean-adjacent areas and amount of beach mileage.
Boat Slips	"	1,511											
Beaches	linear miles	48											
Discharges													
Point Sources													Excludes the PG&E power plant and refractory.
Direct	bgp of wastewater	15											
Indirect	"	9											
Non-Point Sources	bgp of wastewater	175											
Research/Education													
Facilities	number	11											Excludes the U.S. Fish and Wildlife research station and the U.C. Landels-Hill research facility.
Military													
Training Areas	square nautical miles	58											Only includes two military operations areas in Monterey Bay itself.

Bars are rounded to the nearest 10 percent.
Abbreviations: bgp-billion gallons per year; mil. cu. yds.-million cubic yards; ml.-miles.

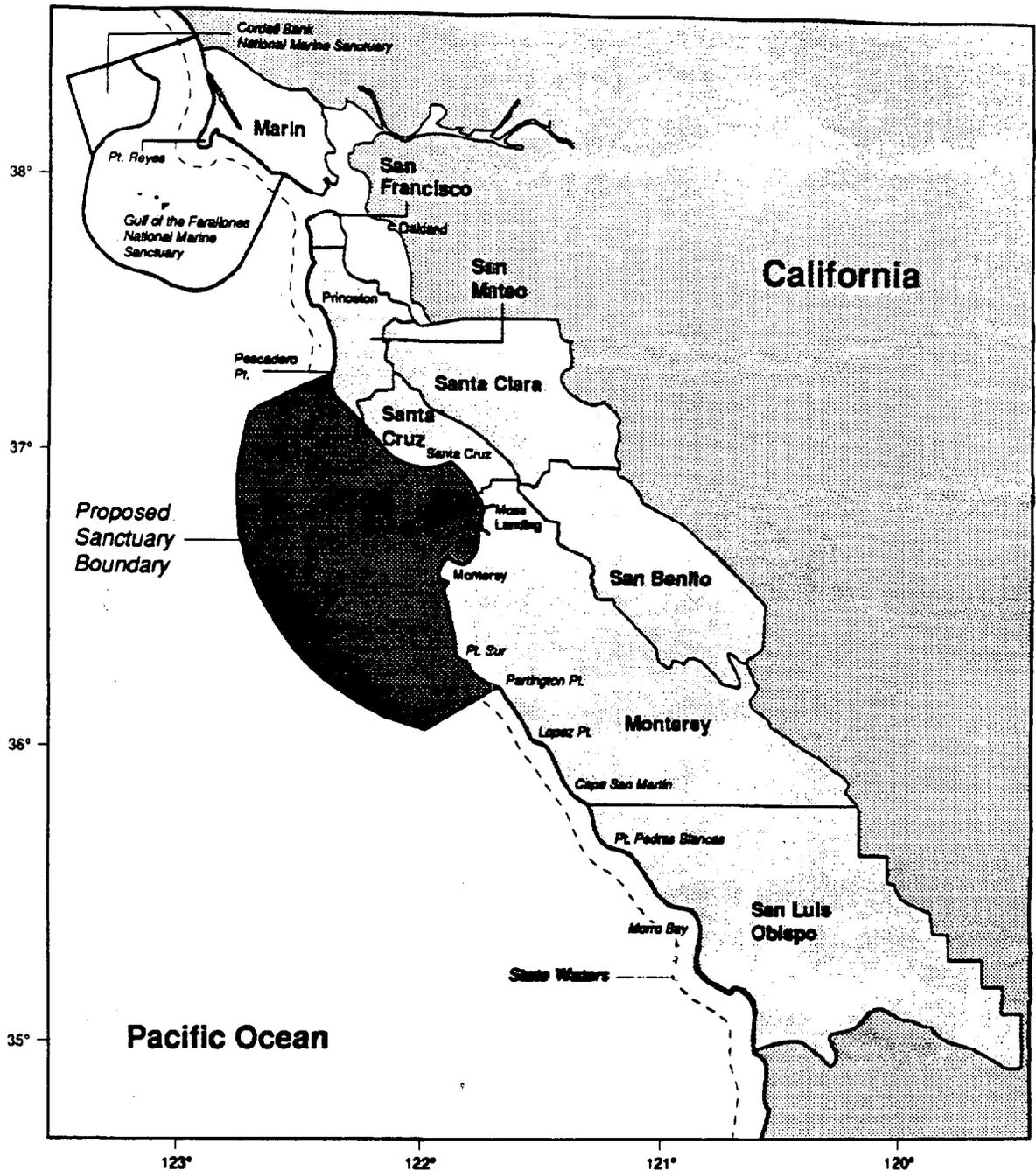
C. Boundary Alternative 2

1. Geography

This proposed boundary, the preferred alternative, includes the entire Monterey Canyon between the northern boundary of Pescadero Marsh, 2.0 nmi north of Pescadero Point, and the southern boundary of Julia Pfeiffer Burns Underwater Park and Area of Special Biological Significance (ASBS), 2.5 nmi southeast from Partington Point (Figure XX). The boundary extends from the mean high tide line from these sites seaward approximately 18 nmi on a southwesterly heading of 240°. These southern and northern boundaries are joined by an arc drawn from Moss Landing, with a radius of 46 nmi, over the entire Monterey Canyon complex out to the abyssal plain at 1500 fathoms (approx 3,000 m). Santa Cruz, Moss Landing (except for Elkhorn Slough), and Monterey Harbors are all excluded from the Sanctuary Boundaries.

2. Distinguishing Characteristics

Most resource values (i.e., kelp, historical sites, protected areas) are similar to those in Alternatives 1, 6, and 7 (Table X). However, this alternative contains higher concentrations of species and greater canyon area than those alternatives. It also contains over half of all seabird and pinniped rookeries/colonies and cetacean high concentration areas. This boundary alternative encompasses approximately 84% of the canyons within the study area. The submerged lands of Boundary Alternative 2 contain an estimated 110 billion barrels of oil and 150 billion cubic feet of natural gas (Table X). This boundary extends seaward to a depth of 1,500 fathoms and includes the productive fishing grounds around the Monterey Canyon. Onshore development is concentrated along the coast of Monterey Bay.



- Boundary Alternative 2 establishes a Sanctuary of 2,539 square nautical miles
- It borders 182 nautical miles of shoreline
- Federal and state waters account for 84 percent and 16 percent, respectively, of the proposed Sanctuary

**Boundary Alternative 2
Summary of Resources**

Category/ Subcategory	Units	Amount	Percent of Total within Boundary Alternative										Comments
			10	20	30	40	50	60	70	80	90	100	
Existing Protected Areas													
Parks	number of sites	8	[Bar chart showing 100% distribution]										Includes state historic parks.
Refuges	"	3	[Bar chart showing 100% distribution]										
Reserves	"	4	[Bar chart showing 100% distribution]										Data are for Monterey and Santa Cruz counties. ASBS sites are also classified as state parks, refuges, or reserves.
TOTAL	"	15	[Bar chart showing 100% distribution]										
ASBS	"	5	[Bar chart showing 100% distribution]										
Biological													
Invertebrates	number of phyla	31	[Bar chart showing 100% distribution]										Includes ASBS plus Asilomar and Pt. Sur.
	no. comm. imp. species	19	[Bar chart showing 100% distribution]										
	no. high concen. areas*	7	[Bar chart showing 100% distribution]										
Fish	number of species	333	[Bar chart showing 100% distribution]										
	% rockfish habitat	45	[Bar chart showing ~45% distribution]										
	% squid spawn. habitat	39	[Bar chart showing ~39% distribution]										
Turtles	number of species	4	[Bar chart showing 100% distribution]										Listed species are not normally year-round residents.
Seabirds	number of species	94	[Bar chart showing 100% distribution]										
	no. of rookeries/colonies	14	[Bar chart showing 100% distribution]										
	% high concen. areas	44	[Bar chart showing ~44% distribution]										
Fissipeds	number of individuals	746	[Bar chart showing 100% distribution]										
	range (nautical miles)	87	[Bar chart showing ~70% distribution]										
Pinnipeds	number of species	5	[Bar chart showing 100% distribution]										Excludes occasionally stranded Guadalupe Seals.
	no. of rookeries/colonies	7	[Bar chart showing 100% distribution]										
	% high concen. areas	44	[Bar chart showing ~44% distribution]										
Cetaceans	number of species	20	[Bar chart showing 100% distribution]										Concentration only includes gray whales, dolphins, and porpoises.
	% high concen. areas	57	[Bar chart showing ~57% distribution]										
Physical/Chemical													
Upwelling Zones	number	2	[Bar chart showing 100% distribution]										Offshore of Pt. Sur and Ano Nuevo.
Freshwater Input	cubic feet per second	1,113	[Bar chart showing 100% distribution]										
Water Quality	Monitoring Stations	75	[Bar chart showing 100% distribution]										Criteria measured includes cadmium, which is often measured in high concentration due to natural sources.
	Exceeding Criteria	number stations	38	[Bar chart showing 100% distribution]									
Habitats													
Canyon	square nautical miles	565	[Bar chart showing 100% distribution]										
Kelp	nautical miles	105	[Bar chart showing 100% distribution]										
Wetlands	square miles	23	[Bar chart showing 100% distribution]										
Historical													
Shipwrecks	number of sites	109	[Bar chart showing 100% distribution]										Sites reported, not all verified. Only one offshore. Sites reported and verified.
Prehistoric	"	475	[Bar chart showing 100% distribution]										

Bars are rounded to the nearest 10 percent

*within intertidal zone

Abbreviations: altm.-alternative; ASBS-area of special biological significance; comm.-commercially; concen.-concentration; imp.-important; no.-number; spawn.-spawning.

**Boundary Alternative 2
Summary of Human Uses**

Category/ Subcategory	Units	Amount	Percent of Total within Boundary Alternative										Comments
			10	20	30	40	50	60	70	80	90	100	
Commercial Fishing													Represents landings at the ports of Monterey, Moss Landing, and Santa Cruz.
Fishing Vessels	number	755											
Rockfish	thousand dollars	2,115											
Salmon		2,017											
Total Value of all Fish		9,831											
Vessel Traffic/Dredging													Excludes fishing vessels and vessels heading north from San Francisco Bay area. Excludes 1 mil. cu. yds. per year of dredged and disposed sand off of Golden Gate.
Commercial Shipping	vessels/year	3,900											
Dredge Disposal	cubic yards/year	50,000											
Dredging	cubic yards/year	182,000											
Development													The average rate of development between 1970 and 1988. Population and development are greatest in communities along the coast. Includes Monterey and Santa Cruz counties.
Residential	units/year	3,794											
Commercial	buildings/year	202											
Population	thousand persons	585											
Energy/Mining													
Oil	million barrels	110											
Natural Gas	billion cubic feet	150											
Sand Mining	cubic yards/year	150,000											
Adjacent Land Use													Urban lands are concentrated in population centers clustered around Monterey Bay. Rangelands, forest lands, and agricultural lands are greatest in the southern portion of the Boundary Alternative.
Urban	square miles	213											
Range	"	1,420											
Forest	"	2,284											
Agriculture	"	949											
Public Recreation													
Ocean-Adjacent Areas	number	39											
Boat Slips	"	1,511											
Beaches	linear miles	45											
Discharges													Excludes the PG&E power plant and refractory.
Point Sources													
Direct	bgy of wastewater	15											
Indirect	"	9											
Non-Point Sources	bgy of wastewater	175											
Research/Education													Excludes the U.S. Fish and Wildlife research station and the U.C. Landels-Hill research facility.
Facilities	number	11											
Military													
Training Areas	square nautical miles	1,015											

Bars are rounded to the nearest 10 percent.
Abbreviations: bgy-billion gallons per year; mil. cu. yds.-million cubic yards.

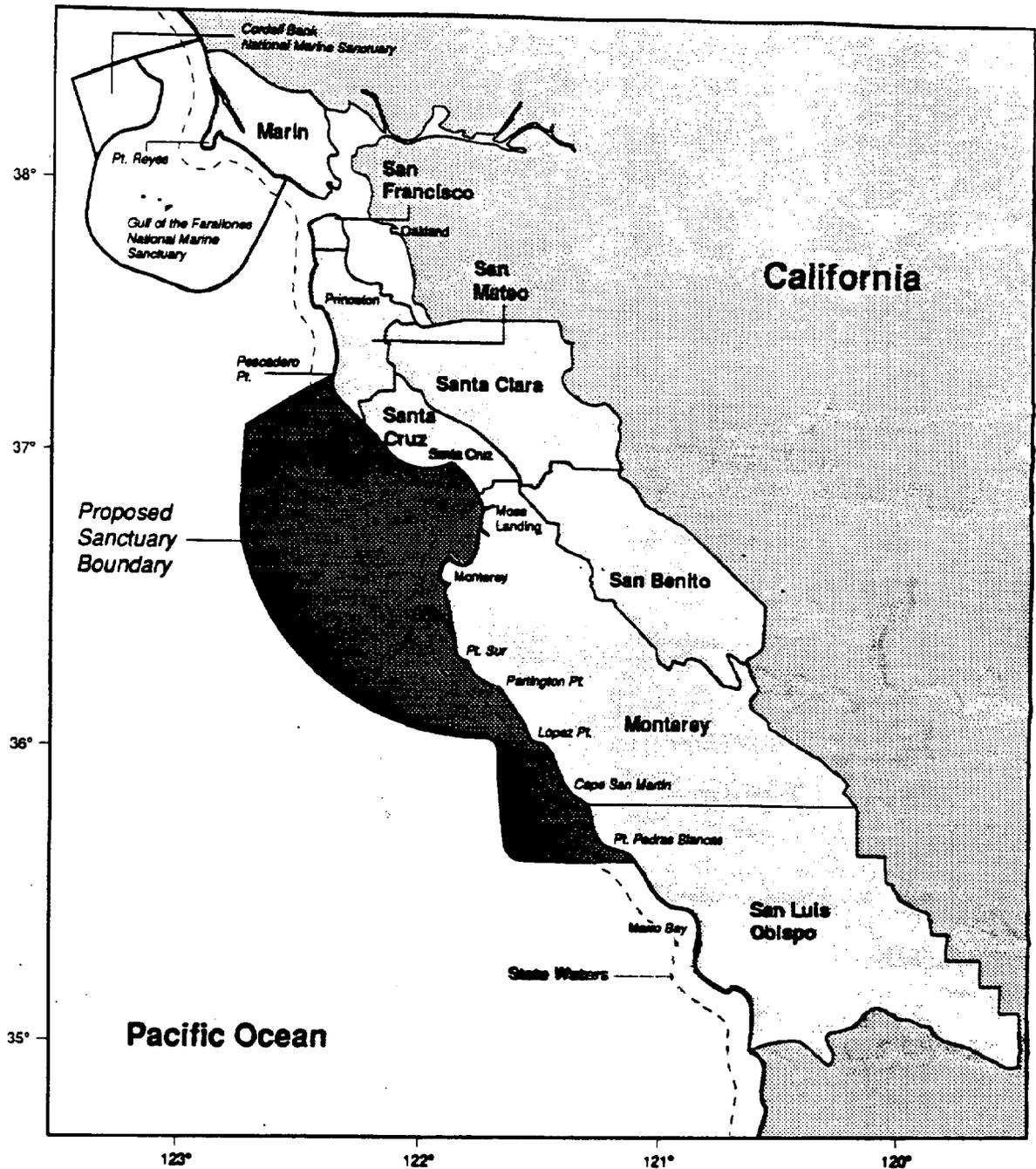
D. Boundary Alternative 3

1. Geography

This alternative is a variation of Alternative 2 with a boundary extension to the south (Figure XX). Specifically, the boundary extends south from the southern boundary of the preferred alternative, along the 500 fathom isobath (1,000 m) to a point due east of Cambria and then shoreward to the mean high tide level at Cambria.

2. Distinguishing Characteristics

Boundary Alternative 3 includes the central and southern regions of the study area. Excluding Alternative 5, it includes the highest concentrations of cetaceans, pinnipeds, fissipeds, and the largest fissiped range (Table X). The southern extension of the proposed boundary encompasses the California Sea Otter Refuge and contains major areas of kelp beds (equal to Alternative 5). It also has the second highest percentage of rockfish habitat, number of fish species (both equal to Alternative 4), and on-shore prehistoric sites. This boundary encompasses approximately 89 percent of the canyons. Because of the proposed alternative's southern extent, adjacent lands contain more forest lands and rangelands than the proposed Alternatives 1, 2, 6, and 7 (Table X). It also receives more non-point runoff than those alternatives. The major commercial fishing grounds around Monterey Canyon are included within this proposal. About 120 billion barrels of oil and 190 billion cubic feet of natural gas are estimated to occur in submerged lands in this alternative.



- Boundary Alternative 3 establishes a Sanctuary of 3,125 square nautical miles
- It borders 279 nautical miles of shoreline
- Federal and state waters account for 82 percent and 18 percent, respectively, of the proposed Sanctuary

**Boundary Alternative 3
Summary of Resources**

Category/ Subcategory	Units	Amount	Percent of Total within Boundary Alternative										Comments
			10	20	30	40	50	60	70	80	90	100	
Existing Protected Areas													
Parks	number of sites	8	[Bar chart showing 80% coverage]										Includes state historic parks.
Refuges	"	3	[Bar chart showing 100% coverage]										Includes California Sea Otter Game Refuge.
Reserves	"	5	[Bar chart showing 100% coverage]										Data are for Monterey, San Luis Obispo and Santa Cruz counties.
TOTAL	"	16	[Bar chart showing 80% coverage]										
ASBS	"	6	[Bar chart showing 80% coverage]										ASBS sites are also classified as state parks, refuges, or reserves.
Biological													
Invertebrates	number of phyla	31	[Bar chart showing 100% coverage]										Includes ASBS areas plus Asilomar and Pt. Sur.
	no. comm. imp. species	19	[Bar chart showing 100% coverage]										
	no. high concn. areas*	8	[Bar chart showing 80% coverage]										
Fish	number of species	340	[Bar chart showing 100% coverage]										
	% rockfish habitat	72	[Bar chart showing 70% coverage]										
	% squid spawn. habitat	51	[Bar chart showing 40% coverage]										
Turtles	number of species	4	[Bar chart showing 100% coverage]										Listed species are not normally residents of the zone.
Seabirds	number of species	94	[Bar chart showing 100% coverage]										
	no. of rookeries/colonies	17	[Bar chart showing 70% coverage]										
	% high concn. areas	57	[Bar chart showing 60% coverage]										
Fissipeds	number of individuals	1,241	[Bar chart showing 100% coverage]										Includes highest concentration of sea otters near Pt. Piedras Blancas (California Sea Otter Refuge).
	range (nautical miles)	130	[Bar chart showing 100% coverage]										
Pinnipeds	number of species	5	[Bar chart showing 100% coverage]										Excludes occasionally stranded Guadalupe Seals.
	no. of rookeries/colonies	8	[Bar chart showing 80% coverage]										
	% high concn. areas	79	[Bar chart showing 70% coverage]										
Cetaceans	number of species	20	[Bar chart showing 100% coverage]										Concentration only includes gray whales, dolphins, and porpoises.
	% high concn. areas	82	[Bar chart showing 80% coverage]										
Physical/Chemical													
Upwelling Zones	number	2	[Bar chart showing 70% coverage]										Offshore of Pt. Sur and Ano Nuevo.
Freshwater Input	cubic feet per second	1,167	[Bar chart showing 100% coverage]										
Water Quality			[Bar chart showing 100% coverage]										Criteria measured includes cadmium, which is often measured in high concentration due to natural sources.
Monitoring Stations	number	77	[Bar chart showing 100% coverage]										
Exceeding Criteria	number stations	37	[Bar chart showing 80% coverage]										
Habitats													
Canyon	square nautical miles	604	[Bar chart showing 80% coverage]										Includes all major kelp habitats.
Kelp	nautical miles	201	[Bar chart showing 100% coverage]										
Wetlands	square miles	23	[Bar chart showing 100% coverage]										
Historical													
Shipwrecks	number of sites	114	[Bar chart showing 40% coverage]										Sites reported, not all verified. 6 offshore. Sites reported and verified.
Prehistoric	"	662	[Bar chart showing 80% coverage]										

Bars are rounded to the nearest 10 percent.

*within intertidal zone

Abbreviations: altm.-alternative; ASBS-area of special biological significance; comm.-commercially; concn.-concentration; imp.-important; no.-number; spawn.-spawning.

**Boundary Alternative 3
Summary of Human Uses**

Category/ Subcategory	Units	Amount	Percent of Total within Boundary Alternative										Comments
			10	20	30	40	50	60	70	80	90	100	
Commercial Fishing													
Fishing Vessels	number	755											Represents landings at the ports of Monterey, Moss Landing, and Santa Cruz. Landings are the same for boundary alternatives 1, 2, 3, 6, and 7.
Rockfish	thousand dollars	2,115											
Salmon	.	2,017											
Total Value of all Fish	.	9,831											
Vessel Traffic/Dredging													
Commercial Shipping	vessels/year	3,900											Excludes fishing vessels. Excludes vessels heading north from San Francisco Bay area. Excludes 1 mil. cu. yds. per year of dredged and disposed sand off of Golden Gate.
Dredge Disposal	cubic yards/year	50,000											
Dredging	cubic yards/year	182,000											
Development													
Residential	units/year	3,794											The average rate of development between 1970 and 1988. Population and development are greatest in communities along the coast. Includes Monterey and Santa Cruz counties.
Commercial	buildings/year	202											
Population	thousand persons	585											
Energy/Mining													
Oil	million barrels	120											
Natural Gas	billion cubic feet	190											
Sand Mining	cubic yards/year	150,000											
Adjacent Land Use													
Urban	square miles	215											Urban lands are concentrated in population centers clustered around Monterey Bay. Rangelands, forest lands, and agricultural lands are greatest in the southern portion of this alternative.
Range	.	1,503											
Forest	.	2,523											
Agriculture	.	948											
Public Recreation													
Ocean-Adjacent Areas	number	43											
Boat Slips	.	1,511											
Beaches	linear miles	51											
Discharges													
Point Sources													The southern extension adds only a minor amount of point source discharges (excludes PG&E plant and refinery). Runoff from forest lands account for 40% of non-point total.
Direct	bg of wastewater	15											
Indirect	.	9											
Non-Point Sources	bg of wastewater	190											
Research/Education													
Facilities	number	13											Includes all research facilities in study area.
Military													
Training Areas	square nautical miles	1,030											

Bars are rounded to the nearest 10 percent.
Abbreviations: bgy-billion gallons per year; mil. cu. yds.-million cubic yards.

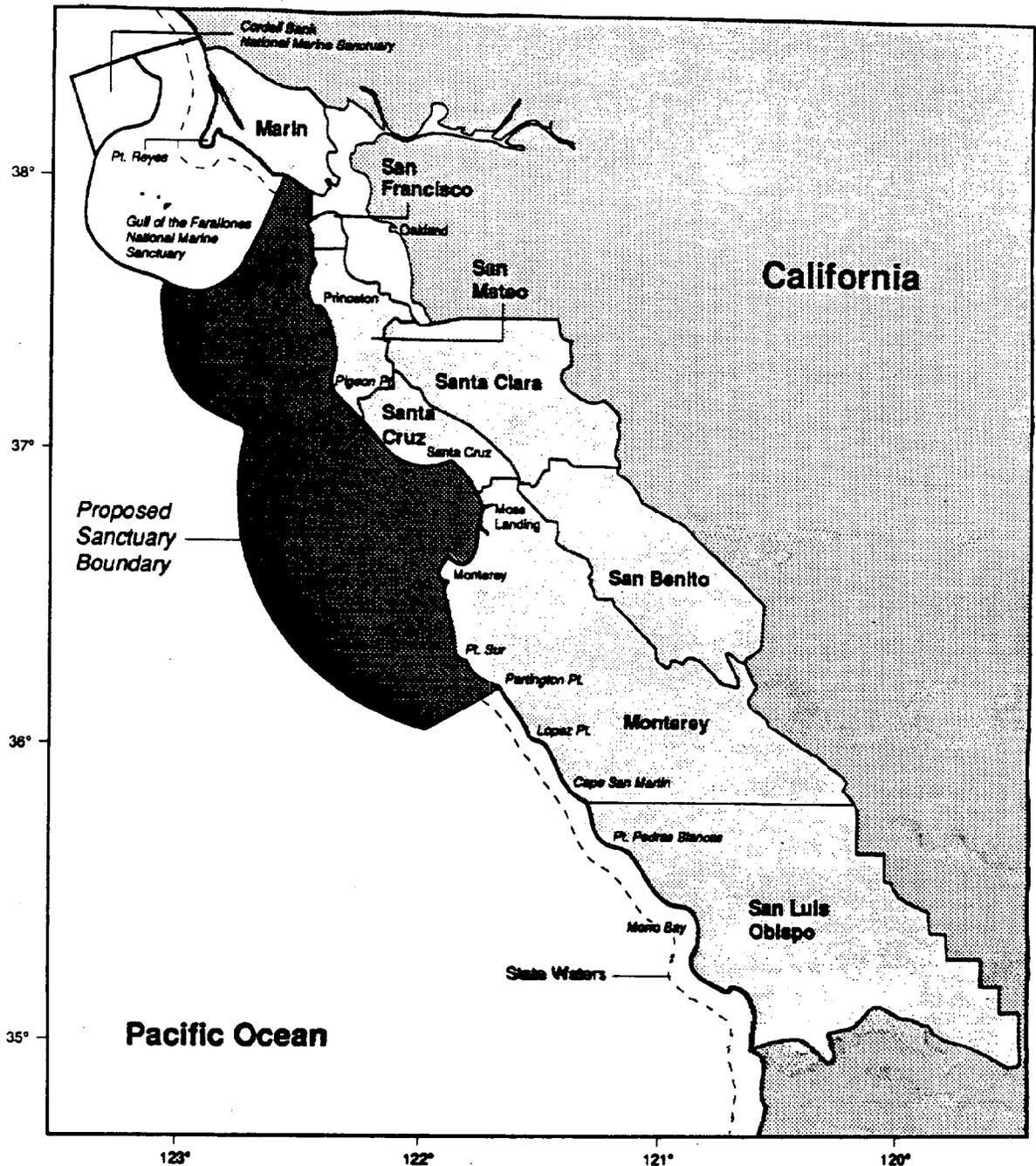
E. Boundary Alternative 4

1. Geography

This alternative is another variation of Alternative 2, but with a boundary extension to the north (Figure XX). Specifically, the boundary extends north from the northern boundary of the preferred alternative, along the 500 fathom isobath (1,000 m), to the border of the Gulf of the Farallones National Marine Sanctuary. The northern border of this alternative is then contiguous with the Gulf of the Farallones National Marine Sanctuary. The boundary then proceeds generally south along the mean high tide level, across the Golden Gate from Point Bonita to Point Lobos, but excludes Princeton Harbor in Half Moon Bay, until it rejoins the boundary of the preferred Alternative 2 at the northern boundary of Pescadero State Beach.

2. Distinguishing Characteristics

Boundary Alternative 4 includes the central and northern regions of the study area. It contains the second highest percentage of squid spawning habitat and the second widest variety of fish species (equal to Alternative 3) (Table X). The northern extension adds a high concentration of birds and invertebrates. This proposal also has the greatest number of reserves (excluding Alternative 5), including the Fitzgerald Marine Reserve, which contains a very diverse invertebrate community. This boundary also encompasses the most shipwreck sites and the largest number of canyons (89 percent of those in the study area). This is the only alternative with as many upwelling zones (3) as Alternative 5. It is also ranked second in total number of water quality monitoring stations. Because of its northern extent, it contains over 360 billion barrels of oil and 550 cubic feet of natural gas (second only to Boundary Alternative 5) (Table X). This alternative includes important commercial shipping fairways that enter and exit San Francisco Bay. Lands adjacent to proposed Alternative 4 include four major commercial fishing ports. The heavily populated communities that border the proposed Sanctuary are experiencing rapid commercial and residential development. Non-point runoff from urban lands is highest (excluding Alternative 5) in this area.



- Boundary Alternative 4 establishes a Sanctuary of 3,507 square nautical miles
- It borders 267 nautical miles of shoreline
- Federal and state waters account for 85 percent and 15 percent, respectively, of the proposed Sanctuary

**Boundary Alternative 4
Summary of Resources**

Category/ Subcategory	Units	Amount	Percent of Total within Boundary Alternative										Comments	
			10	20	30	40	50	60	70	80	90	100		
Existing Protected Areas														
Parks	number of sites	8	[Bar chart showing 80% coverage]										Includes state historic parks. Includes San Mateo, Monterey, and Santa Cruz counties. Includes the Fitzgerald Marine Reserve.	
Refuges	"	3	[Bar chart showing 100% coverage]											
Reserves	"	7	[Bar chart showing 100% coverage]											
TOTAL	"	18	[Bar chart showing 100% coverage]											
ASBS	"	6	[Bar chart showing 100% coverage]										ASBS sites are also classified as state parks, refuges, or reserves.	
Biological														
Invertebrates	number of phyla	31	[Bar chart showing 100% coverage]										Includes ASBS plus Asilomar, and Pt. Sur.	
	no. comm. imp. species	19	[Bar chart showing 100% coverage]											
	no. high concn. areas*	8	[Bar chart showing 100% coverage]											
Fish	number of species	340	[Bar chart showing 100% coverage]											
	% rockfish habitat	73	[Bar chart showing 73% coverage]											
	% squid spawn. habitat	88	[Bar chart showing 88% coverage]											
Turtles	number of species	4	[Bar chart showing 100% coverage]											Listed species are not normally residents of zone.
Seabirds	number of species	94	[Bar chart showing 100% coverage]											
	no. of rookeries/colonies	20	[Bar chart showing 100% coverage]											
	% high concn. areas	84	[Bar chart showing 84% coverage]											
Fissipeds	number of individuals	746	[Bar chart showing 100% coverage]											
	range (nautical miles)	87	[Bar chart showing 100% coverage]											
Pinnipeds	number of species	5	[Bar chart showing 100% coverage]										Excludes occasionally stranded Guadalupe seals.	
	no. of rookeries/colonies	8	[Bar chart showing 100% coverage]											
	% high concn. areas	59	[Bar chart showing 59% coverage]											
Cetaceans	number of species	20	[Bar chart showing 100% coverage]											
	% high concn. areas	71	[Bar chart showing 71% coverage]											
Physical/Chemical														
Upwelling Zones	number	3	[Bar chart showing 100% coverage]										Offshore of Ano Nuevo, Half Moon Bay, and Pt. Sur.	
Freshwater Input	cubic feet per second	1,174	[Bar chart showing 100% coverage]											
Water Quality														
Monitoring Stations	number	79	[Bar chart showing 100% coverage]										Criteria measured includes cadmium, which is often measured in high concentration due to natural sources. Contains second greatest no. of stations.	
Exceeding Criteria	number stations	38	[Bar chart showing 100% coverage]											
Habitats														
Canyon	square nautical miles	637	[Bar chart showing 100% coverage]											
Kelp	nautical miles	105	[Bar chart showing 100% coverage]											
Wetlands	square miles	23	[Bar chart showing 100% coverage]											
Historical														
Shipwrecks	number of sites	305	[Bar chart showing 100% coverage]										Reported, not verified.	
Prehistoric	"	531	[Bar chart showing 100% coverage]										1 offshore. Reported and verified.	

Bars are rounded to the nearest 10 percent
*within intertidal zone

Abbreviations: altm.-alternative; ASBS-areas of special biological significance; comm.-commercially; Fitz. Mar. Res.- Fitzgerald Marine Reserve; imp.-important; inc.-include; no.-number; spawn.-spawning.

**Boundary Alternative 4
Summary of Human Uses**

Category/ Subcategory	Units	Amount	Percent of Total within Boundary Alternative										Comments
			10	20	30	40	50	60	70	80	90	100	
Commercial Fishing													
Fishing Vessels	number	1,044											Represents landings in 1986 at the ports of Monterey, Moss Landing, and Santa Cruz. Landings for Princeton are as of 1989.
Rockfish	thousand dollars	2,481											
Salmon	"	4,095											
Total Value of Fish	"	14,673											
Vessel Traffic/Dredging													
Commercial Shipping	vessels/year	9,000											All commercial vessels (excluding fishing) pass through this alternative. Northern extension includes 3 proposed dredge disposal sites. These sites could receive up to 8 mil. cu. yds. per year. One site used for disposal of 1 mil. cu. yds. per year of sand from Golden Gate.
Dredge Disposal	cubic yards/year	50,000											
Dredging	cubic yards/year	182,000											
Development													
Residential	units/year	6,975											The average rate of development between 1970 and 1989. Population and development are greatest in communities along the coast. Includes Monterey, San Mateo, and Santa Cruz counties.
Commercial	buildings/year	329											
Population	thousand persons	1,235											
Energy/Mining													
Oil	million barrels	360											
Natural Gas	billion cubic feet	550											
Sand Mining	cubic yards/year	150,000											
Adjacent Land Use													
Urban	square miles	240											
Range	"	1,166											
Forest	"	2,390											
Agriculture	"	955											
Public Recreation													
Ocean-Adjacent Areas	number	52											
Boat Slips	"	2,222											
Beaches	linear miles	68											
Discharges													
Point Sources													Excludes PG&E power plant and refractory at Moss Landing.
Direct	bgg of wastewater	28											
Indirect	"	22											
Non-Point Sources	bgg of wastewater	230											
Research/Education													
Facilities	number	11											Excludes the U.S. Fish and Wildlife research station and the U.C. Lardale-Hill research facility.
Military													
Training Areas	square nautical miles	1,288											

Bars are rounded to the nearest 10 percent.
Abbreviations: bgg-billion gallons per year; mil. cu. yds.-million cubic yards.

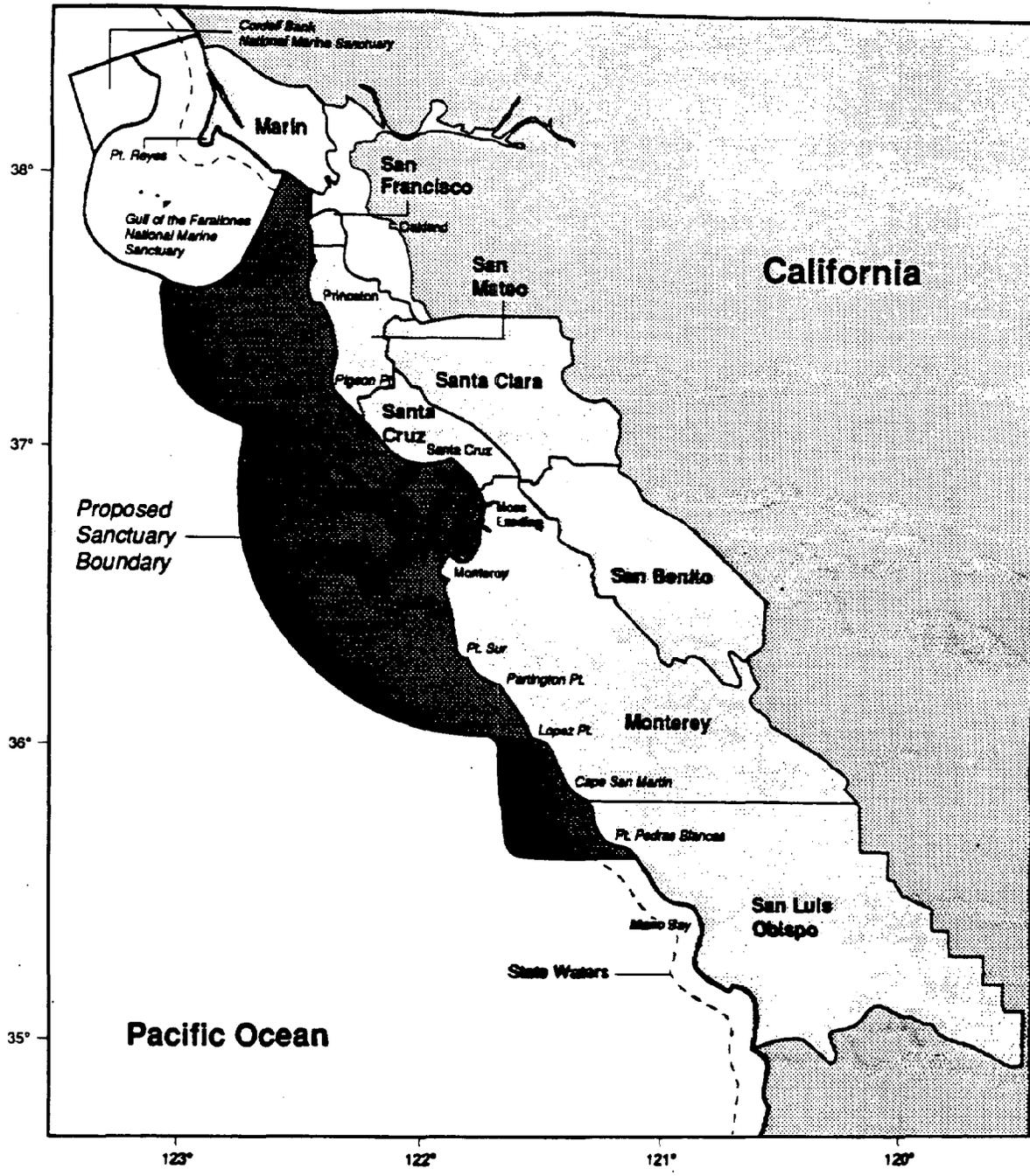
F. Boundary Alternative 5

1. Geography

This boundary alternative, also the study area, is a composite of proposals 3 and 4 (Figure XX). The northern terminus of the boundary is located along the southern boundary of the Gulf of Farallones National Marine Sanctuary and runs westward to approximately 123°07'W. The boundary then extends south in an arc which generally follows the 500 fathom isobath. At approximately 37°03'N, the boundary arcs south to 122°25'W, 36°10'N, due west of Partington Pt. The boundary again follows the 500 fathom isobath south to 121°41'W, 35°33'N, due west of Cambria. The boundary then extends shoreward towards the mean high-water line. The landward boundary is defined by the mean high-water line between the Gulf of Farallones National Marine Sanctuary and Cambria, crossing the Golden Gate from Point Bonita to Point Lobos. The harbors of Monterey (excluding Elkhorn Slough), Moss Landing, Princeton, and Santa Cruz are excluded from this alternative.

2. Distinguishing Characteristics

Species from 31 of the 33 invertebrate phyla have been found in this region. Within this boundary alternative there are four endangered species of turtles and 94 species of birds occupying 23 rookeries/colonies (Table X). There are also five species of pinnipeds, including rapidly declining populations of Northern Fur Seals and Steller Sea Lions, using nine rookeries/colonies. This area also contains 20 species of cetaceans, many endangered. The alternative includes the California Sea Otter Refuge within its southern portion, as well as over 1,000 historical sites, 1,200 cfs of freshwater input, and 80 water quality monitoring stations. There are three major areas of upwelling of nutrient-rich waters and corresponding periods of high primary productivity, along with large areas of kelp, wetlands, and canyons. The area adjacent to this alternative includes over one million people with residential and commercial development mainly along Monterey Bay (Table X). The largest point source discharges also are concentrated along this coastline. The 55 public outdoor recreation sites that are adjacent to ocean waters in this alternative provide beach access. In addition, several marinas found in the area provide access to the Pacific Ocean.



- Boundary Alternative 5 establishes a Sanctuary of 4,095 square nautical miles
- It borders 362 nautical miles of shoreline
- Federal and state waters account for 83 percent and 17 percent, respectively, of the proposed Sanctuary

**Boundary Alternative 5
Summary of Resources**

Category/ Subcategory	Units	Amount	Percent of Total within Boundary Alternative 5										Comments
			10	20	30	40	50	60	70	80	90	100	
Existing Protected Areas													
Parks	number of sites	9											Includes state historic parks.
Refuges	"	3											
Reserves	"	8											
TOTAL	"	20											Data are shown for Monterey, San Luis Obispo, San Mateo, and Santa Cruz counties.
ASBS	"	7											ASBS sites also classified as state parks, refuges, or reserves.
Biological													
Invertebrates	number of phyla	31											Concentration areas include ASBS sites plus Atilomar, and Pt. Sur.
	no. comm. imp. species	19											
	no. high concn. areas*	9											
Fish	number of species	345											
	% rockfish habitat	100											
	% squid spawn. habitat	100											
Turtles	number of species	4											Listed species are not normally residents of the zone.
Seabirds	number of species	94											Higher concentrations in northern and central portions.
	no. of rookeries/colonies	23											
	% high concn. areas	100											
Fissipeds	number of individuals	1,241											Higher concentration in the southern portion.
	range (nautical miles)	130											
Pinnipeds	number of species	5											Excludes occasionally stranded Guadalupe Seals.
	no. of rookeries/colonies	9											
	% high concn. areas	100											
Cetaceans	number of species	20											One-third occur frequently w/ boundary; six are endangered (e.g. blue, fin, gray, humpback, right whales). Concn. includes gray whales, dolphins and porpoises.
	% high concn. areas	100											
Physical/Chemical													
Upwelling Zones	number	3											Offshore of Ano Nuevo, Half Moon Bay, and Pt. Sur.
Freshwater Input	cubic feet per second	1,228											
Water Quality													
Monitoring Stations	number	81											Criteria measured includes cadmium, which is often measured in high concentration due to natural sources.
Exceeding Criteria	number stations	39											
Habitats													
Canyon	square nautical miles	676											
Kelp	nautical miles	201											
Wetlands	square miles	23											
Historical													
Ship Wrecks	number of sites	311											Sites reported, not all verified.
Prehistoric	"	718											6 offshore. Sites reported and verified.

Bars are rounded to the nearest 10 percent.

*within intertidal zone

Abbreviations: ASBS-areas of special biological significance; comm.-commercially; concn.-concentration; inc.-include; imp.-important; no.-number; spawn.-spawning; w/-within.

**Boundary Alternative 5
Summary of Human Uses**

Category/ Subcategory	Units	Amount	Percent of Total within Boundary Alternative 5										Comments
			10	20	30	40	50	60	70	80	90	100	
Commercial Fishing													
Fishing Vessels	number	1,044											Represents landings in 1988 at the ports of Monterey, Moss Landing, and Santa Cruz. Landings for Princeton are as of 1989.
Rockfish	thousand dollars	2,481											
Salmon	"	4,095											
Total Value of all Fish	"	14,673											
Vessel Traffic/Dredging													
Commercial Shipping	vessels/year	9,000											All commercial vessels (excluding fishing) pass through this alternative. Northern extension includes 3 proposed dredge disposal sites. These sites could receive up to 8 mil. cu. yds. per year. One site used for disposal of 1 mil. cu. yds. per year of sand from Golden Gate.
Dredge Disposal	cubic yards/year	50,000											
Dredging	cubic yards/year	182,000											
Development													
Residential	units/year	6,975											The average rate of development between 1970 and 1999. Population and development are greatest in communities along the coast. Includes Monterey, San Mateo, and Santa Cruz counties.
Commercial	buildings/year	329											
Population	thousand persons	1,235											
Energy/Mining													
Oil	million barrels	370											Oil and gas are concentrated in the northern part of Alternative 5.
Natural Gas	billion cubic feet	590											
Sand Mining	cubic yards/year	150,000											
Adjacent Land Use													
Urban	square miles	242											Forest lands account for almost one-half of all lands adjacent to boundary Alternative 5. Urban lands are concentrated along coast.
Range	"	1,613											
Forest	"	2,628											
Agriculture	"	957											
Public Recreation													
Ocean-Adjacent Areas	number	56											Proposed alternative contains the most recreational facilities. Ninety-five percent of the boat slips are located in Half Moon Bay, Monterey, and Santa Cruz.
Boat Slips	"	2,252											
Beaches	linear miles	68											
Discharges													
Point Sources													Excludes the PG&E power plant and refinery in Moss Landing. Plant discharges 281 bgy of cooling waters.
Direct	bgg of wastewater	28											
Indirect	"	22											
Non-Point Sources	bgg of wastewater	245											
Research/Education													
Facilities	number	13											Includes all major research/education facilities.
Military													
Training Areas	square nautical miles	1,350											

Bars are rounded to the nearest 10 percent.
Abbreviations: bgy - billion gallons per year; mil. cu. yds. - million cubic yards.

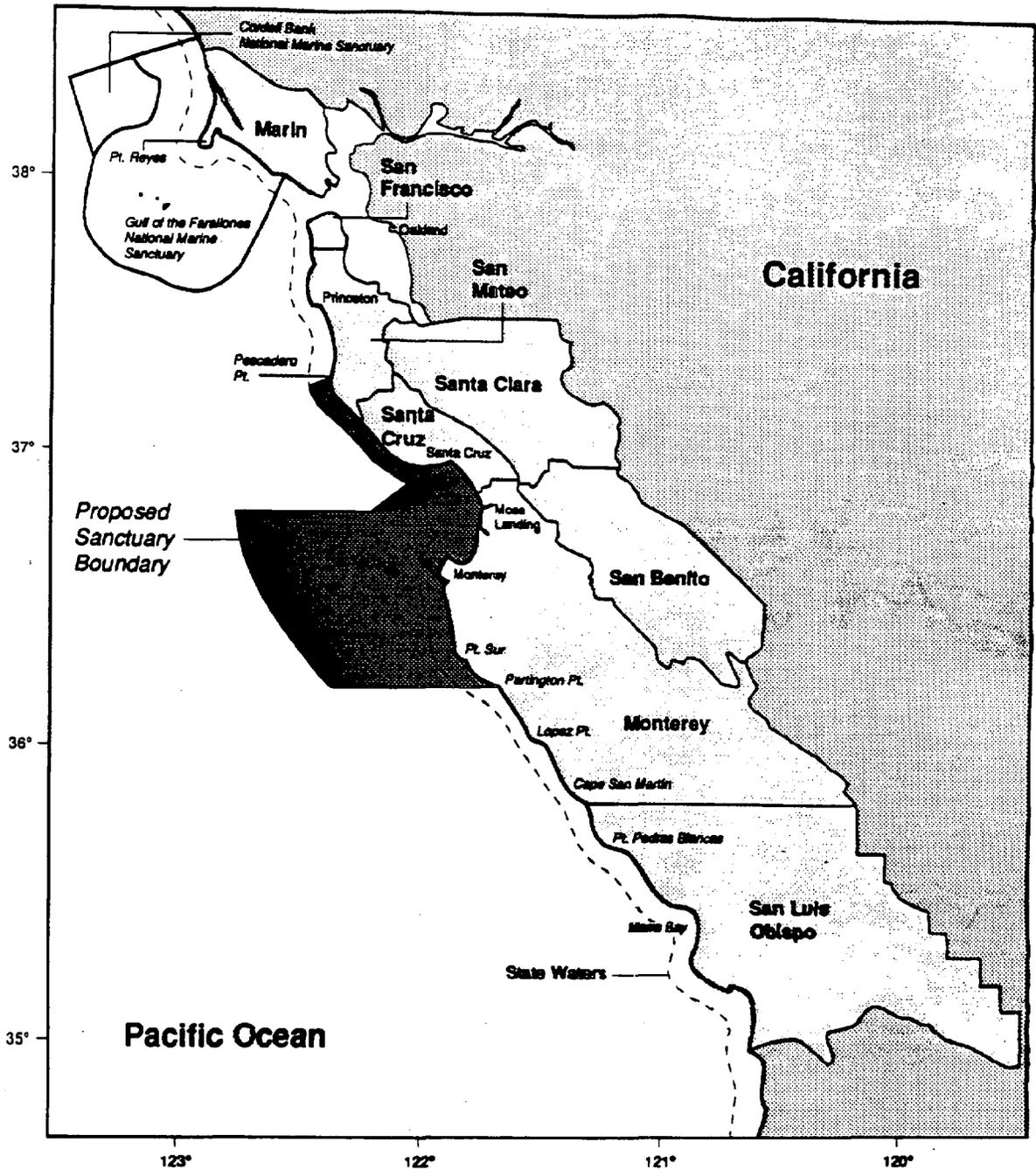
G. Boundary Alternative 6

1. Geography

Proposed boundary alternative 6 would begin at Pescadero Point and proceed on a southwesterly heading of 240° out to the seaward limit of state controlled waters (Figure XX). This alternative would then proceed south along the State Water boundary to a point of 240° off Table Rock, where it then runs on a southwesterly heading of 240° to 36°50'N latitude. The boundary then proceeds due west along this latitude to a point 46 nmi from Moss Landing. Finally, the boundary moves southward along an arc drawn from Moss Landing, with a radius of 46 nmi, to 36°10'N latitude and then proceeds due east to Partington Point.

2. Distinguishing Characteristics

Boundary Alternative 6 has similar onshore activities as alternatives 1, 2, and 7. It also has similar resource values as Alternatives 1, 2, 7, including the same number of water quality stations, historical sites, protected areas, and kelp beds (Table X). About one-half of the highly concentrated areas of cetaceans within the study area are relatively equally distributed throughout this boundary. The fissipeds and pinniped rookeries/colonies are found mostly in the southern portion of this alternative. Unlike Boundary Alternative 1, however, it extends much further offshore. Consequently, it includes the major commercial fishing grounds around Monterey Canyon. This boundary was drawn to exclude Federal waters of high oil and gas resource potential and, as a result, less than one billion barrels of oil and only three billion cubic feet of natural gas are estimated to occur in the Federal submerged lands in this alternative (Table X).



- Boundary Alternative 6 establishes a Sanctuary of 1,506 square nautical miles
- It borders 182 nautical miles of shoreline
- Federal and state waters account for 63 percent and 37 percent, respectively, of the proposed Sanctuary

**Boundary Alternative 6
Summary of Resources**

Category/ Subcategory	Units	Amount	Percent of Total within Boundary Alternative										Comments
			10	20	30	40	50	60	70	80	90	100	
Existing Protected Areas													
Parks	number of sites	8	[Bar chart showing 80% coverage]										Includes state historic parks. Data are for Monterey and Santa Cruz counties. ASBS sites also are also classified as state parks, refuges, or reserves.
Refuges	-	3	[Bar chart showing 100% coverage]										
Reserves	-	4	[Bar chart showing 50% coverage]										
TOTAL	-	15	[Bar chart showing 80% coverage]										
ASBS	-	5	[Bar chart showing 70% coverage]										
Biological													
Invertebrates	number of phyla	31	[Bar chart showing 100% coverage]										Includes ASBS plus Asilomar and Pt. Sur. Listed species are not normally residents of the zone.
	no. comm. imp. species	19	[Bar chart showing 100% coverage]										
	no. high conc. areas*	7	[Bar chart showing 100% coverage]										
Fish	number of species	333	[Bar chart showing 100% coverage]										
	% rockfish habitat	48	[Bar chart showing 50% coverage]										
	% squid spawn. habitat	33	[Bar chart showing 30% coverage]										
Turtles	number of species	4	[Bar chart showing 100% coverage]										
Seabirds	number of species	94	[Bar chart showing 100% coverage]										
	no. of rookeries/colonies	14	[Bar chart showing 100% coverage]										
	% high concen. areas	31	[Bar chart showing 30% coverage]										
Fissipeds	number of individuals	748	[Bar chart showing 100% coverage]										
	range (nautical miles)	87	[Bar chart showing 70% coverage]										
Pinnipeds	number of species	5	[Bar chart showing 100% coverage]										Excludes occasionally stranded Guadalupe Seals.
	no. of rookeries/colonies	7	[Bar chart showing 100% coverage]										
	% high concen. areas	38	[Bar chart showing 40% coverage]										
Cetaceans	number of species	20	[Bar chart showing 100% coverage]										
	% high concen. areas	49	[Bar chart showing 50% coverage]										
Physical/Chemical													
Upwelling Zones	number	2	[Bar chart showing 70% coverage]										Offshore of Pt. Sur and Ano Nuevo.
Freshwater Input	cubic feet per second	1,113	[Bar chart showing 90% coverage]										
Water Quality			[Bar chart showing 100% coverage]										
Monitoring Stations	number	75	[Bar chart showing 80% coverage]										Criteria measured includes cadmium, which is often measured in high concentration due to natural sources.
Exceeding Criteria	number stations	38	[Bar chart showing 100% coverage]										
Habitats													
Canyon	square nautical miles	411	[Bar chart showing 60% coverage]										
Kelp	nautical miles	105	[Bar chart showing 50% coverage]										
Wetlands	square miles	23	[Bar chart showing 100% coverage]										
Historical													
Shipwrecks	number of sites	109	[Bar chart showing 40% coverage]										Sites reported, not all verified. 1 offshore; Sites reported and verified.
Prehistoric		475	[Bar chart showing 70% coverage]										

Bare are rounded to the nearest 10 percent

*within intertidal zone

Abbreviations: altern.-alternative; ASBS-area of special biological significance; comm.-commercially; concen.-concentration; imp.-important; no.-number; spawn.-spawning.

**Boundary Alternative 6
Summary of Human Uses**

Category/ Subcategory	Units	Amount	Percent of Total within Boundary Alternative										Comments
			10	20	30	40	50	60	70	80	90	100	
Commercial Fishing													
Fishing Vessels	number	755											Represents landings at the ports of Monterey, Moss Landing, and Santa Cruz. Landings are the same for boundary alternatives 1, 2, 3, 6, and 7.
Rockfish	thousand dollars	2,115											
Salmon	"	2,017											
Total Value of all Fish	"	9,831											
Vessel Traffic/Dredging													
Commercial Shipping	vessels/year	3,900											Excludes fishing vessels and vessels heading north from San Francisco Bay area. Excludes 1 mil. cu. yds. per year of dredged and disposed sand off of Golden Gate.
Dredge Disposal	cubic yards/year	50,000											
Dredging	cubic yards/year	182,000											
Development													
Residential	units/year	3,794											The average rate of development between 1970 and 1989. Population and development are greatest in communities along the coast. Includes Monterey and Santa Cruz counties.
Commercial	buildings/year	202											
Population	thousand persons	585											
Energy/Mining													
Oil	million barrels	<1											Contains the least amount of oil and gas reserves.
Natural Gas	billion cubic feet	3											
Sand Mining	cubic yards/year	150,000											
Adjacent Land Use													
Urban	square miles	213											Urban lands are concentrated in population centers clustered around Monterey Bay. Rangelands, forest lands, and agricultural lands are greatest in the southern portion of this boundary alternative.
Range	"	1,420											
Forest	"	2,284											
Agriculture	"	945											
Public Recreation													
Ocean-Adjacent Areas	number	39											
Boat Slips	"	1,511											
Beaches	linear miles	65											
Discharges													
Point Sources													Represents discharges from facilities within central area. Excludes the PG&E power plant and refractory.
Direct	bgy of wastewater	15											
Indirect	"	9											
Non-Point Sources	bgy of wastewater	175											
Research/Education													
Facilities	number	11											Excludes the U.S. Fish and Wildlife research station and the U.C. Landels-Hill research facility.
Military													
Training Areas	square nautical miles	834											

Bars are rounded to the nearest 10 percent.
Abbreviations: bgy-billion gallons per year; mil. cu. yds.-million cubic yards.

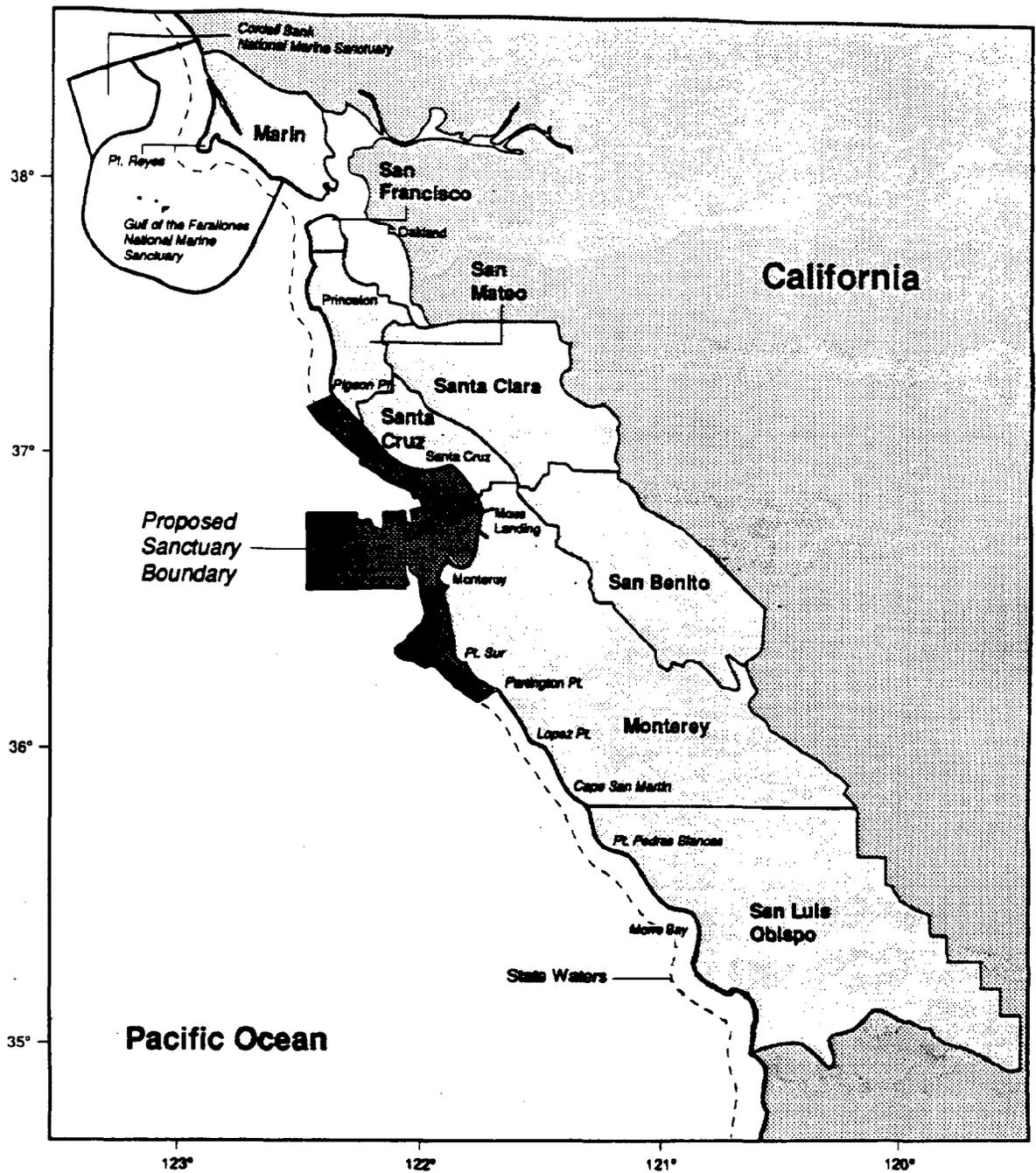
H. Boundary Alternative 7

1. Geography

This alternative is a variation of Boundary Alternative 1, with a seaward extension over the Monterey Bay Canyon (**Figure XX**). Boundary Alternative 7 intersects Boundary Alternative 1 at longitude 122°W, then proceeds seaward along the 500 fathom isobath on the northern side of the Monterey Canyon. This alternative then runs due westward along latitude 36°46'N to longitude 122°30'W, then due south along longitude 122°30'W to latitude 36°30'N. The boundary then turns eastward to intersect with the 100 fathom isobath off Point Lobos where it turns southward along the state water boundary line to eventually proceed shoreward off Partington Point.

2. Distinguishing Characteristics

Most resource values are similar to Alternatives 1, 2, and 6. It has one of the smallest percentages of rockfish and squid spawning habitats (**Table X**). It also has the second smallest area of canyon, as it focuses only on the Monterey Canyon. Higher concentrations of fissipeds occur in the southern section of this proposed alternative. Pinnipeds are concentrated in the central area and seabirds are mostly within the northern and central portions. Boundary Alternative 7 was designed to exclude all areas that were included in the Minerals Management Sale Lease Sale 119 (now canceled). It contains 80 billion barrels of oil and about 110 billion cubic feet of natural gas, the same as Boundary Alternative 1 (**Table X**). Most measures of human use are also the same as for Alternative 1.



- Boundary Alternative 7 establishes a Sanctuary of 844 square nautical miles
- It borders 171 nautical miles of shoreline
- Federal and state waters account for 54 percent and 46 percent, respectively, of the proposed Sanctuary

**Boundary Alternative 7
Summary of Resources**

Category/ Subcategory	Units	Amount	Percent of Total within Boundary Alternative										Comments
			10	20	30	40	50	60	70	80	90	100	
Existing Protected Areas													
Parks	number of sites	8	[Bar chart showing 100% within boundary]										Includes state historic parks.
Refuges	.	3	[Bar chart showing 100% within boundary]										
Reserves	.	4	[Bar chart showing 100% within boundary]										Data are for Monterey and Santa Cruz counties. ASBS sites are also classified as state parks, refuges, or reserves.
TOTAL	.	15	[Bar chart showing 100% within boundary]										
ASBS	.	5	[Bar chart showing 100% within boundary]										
Biological													
Invertebrates	number of phyla	31	[Bar chart showing 100% within boundary]										Includes ASBS plus Pt. Sur and Asilomar.
	no. comm. imp. species	19	[Bar chart showing 100% within boundary]										
	no. high concen. areas*	7	[Bar chart showing 100% within boundary]										
Fish	number of species	333	[Bar chart showing 100% within boundary]										
	% rockfish habitat	21	[Bar chart showing 100% within boundary]										
	% squid spawn. habitat	36	[Bar chart showing 100% within boundary]										
Turtles	number of species	4	[Bar chart showing 100% within boundary]										Listed species are not normally year-round residents.
Seabirds	number of species	94	[Bar chart showing 100% within boundary]										
	no. of rookeries/colonies	13	[Bar chart showing 100% within boundary]										
	% high concen. areas	20	[Bar chart showing 100% within boundary]										
Fissipeds	number of individuals	746	[Bar chart showing 100% within boundary]										
	range (nautical miles)	87	[Bar chart showing 100% within boundary]										
Pinnipeds	number of species	5	[Bar chart showing 100% within boundary]										Excludes occasionally stranded Guadalupe Seals.
	no. of rookeries/colonies	7	[Bar chart showing 100% within boundary]										
	% high concen. areas	21	[Bar chart showing 100% within boundary]										
Cetaceans	number of species	20	[Bar chart showing 100% within boundary]										
	% high concen. areas	27	[Bar chart showing 100% within boundary]										
Physical/Chemical													
Upwelling Zones	number	2	[Bar chart showing 100% within boundary]										Offshore of Pt. Sur and Ano Nuevo.
Freshwater Input	cubic feet per second	1,048	[Bar chart showing 100% within boundary]										
Water Quality													
Monitoring Stations	number	75	[Bar chart showing 100% within boundary]										Criteria measured includes cadmium, which is often measured in high concentration due to natural sources.
Exceeding Criteria	number stations	38	[Bar chart showing 100% within boundary]										
Habitats													
Canyon	square nautical miles	248	[Bar chart showing 100% within boundary]										Alternative with second smallest area of canyon.
Kelp	nautical miles	105	[Bar chart showing 100% within boundary]										
Wetlands	square miles	23	[Bar chart showing 100% within boundary]										
Historical													
Shipwrecks	number of sites	109	[Bar chart showing 100% within boundary]										Sites reported, not all verified. 1 offshore. Sites reported and verified.
Prehistoric	.	475	[Bar chart showing 100% within boundary]										

Bars are rounded to nearest 10 percent

*within intertidal zone

Abbreviations: altern.-alternative; ASBS-areas of special biological significance; comm.-commercially; concen.-concentration; imp.-important; no.-number; spawn.-spawning; w/-within.

**Boundary Alternative 7
Summary of Human Uses**

Category/ Subcategory	Units	Amount	Percent of Total within Boundary Alternative										Comments
			10	20	30	40	50	60	70	80	90	100	
Commercial Fishing													
Fishing Vessels	number	755											Represents landings at the ports of Monterey, Moss Landing, and Santa Cruz.
Rockfish	thousand dollars	2,115											
Salmon	"	2,017											
Total Value of all Fish	"	9,831											
Vessel Traffic/Dredging													
Commercial Shipping	vessels/year	3,900											Excludes fishing vessels and vessels heading north from San Francisco Bay area. Excludes 1 mil. cu. yds. per year of dredged and disposed sand off of Golden Gate.
Dredge Disposal	cubic yards/year	50,000											
Dredging	cubic yards/year	182,000											
Development													
Residential	units/year	3,794											The average rate of development between 1970 and 1989. Population and development are greatest in communities along the coast. Includes Monterey and Santa Cruz counties.
Commercial	buildings/year	202											
Population	thousand persons	585											
Energy/Mining													
Oil	million barrels	80											Contains the same amount as Boundary Alternative 1.
Natural Gas	billion cubic feet	110											
Sand Mining	cubic yards/year	150,000											
Adjacent Land Use													
Urban	square miles	213											Urban lands are concentrated in population centers clustered around Monterey Bay.
Range	"	1,420											
Forest	"	2,284											
Agriculture	"	945											
Public Recreation													
Ocean-Adjacent Areas	number	38											Boundary Alternatives 1 and 7 have the lowest number of ocean-adjacent areas and amount of beach mileage.
Boat Slips	"	1,511											
Beaches	linear miles	44											
Discharges													
Point Sources													Excludes PG&E power plant and refractory.
Direct	bgg of wastewater	15											
Indirect	"	9											
Non-Point Sources	bgg of wastewater	175											
Research/Education													
Facilities	number	11											Excludes the U.S. Fish and Wildlife research station and the U.C. Landels-Hill research facility.
Military													
Training Areas	square nautical miles	146											

Bars are rounded to the nearest 10 percent.
Abbreviations: bgg-billion gallons per year; mil. cu. yds.-million cubic yards.

II. Section: Regulatory Alternatives

A. Introduction

Regulatory alternatives governing ~~nine~~ ~~eight~~ types of potential or current uses of the Sanctuary (oil, gas and mineral activities; discharges and deposits; possession, moving or injury of historical resources; alteration of or construction on the seabed; taking of marine mammals, turtles and seabirds; overflights; "personal water craft"; vessel traffic; and fishing were evaluated in terms of need and effectiveness for resource protection.

In formulating the proposed Sanctuary regulatory regime NOAA: first, analyzed the resources and human uses of the Monterey Bay environment; second, analyzed the existing regulatory regime with regard to protection of the resources and qualities of the Monterey Bay area from possible harmful human activities; third, proposed alternative regulatory regimes, including relying on the existing regulatory regime, to protect the proposed Sanctuary's resources and qualities; fourth, analyzed the environmental consequences of each regulatory alternative, including no additional action with Sanctuary designation, to the resources and qualities of the Monterey Bay area; and fifth, proposed draft regulations based on the preferred course of action, the one deemed necessary to protect Sanctuary resources and qualities.

The choice of proposed regulations was not only based on the environmental consequences of each action and the constraints set by the MPRSA, which states in Section 304(c):

(1) Nothing in this title shall be construed as terminating or granting to the Secretary the right to terminate any valid lease, permit, license, or right of subsistence use or of access if the lease, permit, license, or right -

(A) was in existence on the date of enactment of the Marine Sanctuaries Amendments of 1984, with respect to any national marine sanctuary designated before that date: or

(B) is in existence on the date of designation of any national marine sanctuary, with respect to any national marine sanctuary designated after the date of enactment of the Marine Sanctuaries Amendments of 1984.

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

When the preferred Sanctuary action is either, not to include an activity in these nine categories or, to rely on the status quo to govern the activity (i.e. fishing and vessel traffic), the activity would continue to be subject to existing regulations. In case of conflict with a Sanctuary regulation, the regulation that the Director of the Office of Coastal and Resource Management deems more protective of Sanctuary resources and qualities would govern.

Each proposed Sanctuary regulation is stated below and described in terms of its impact to resources and uses. The status quo regarding each regulation is also given in terms of existing laws, regulations and their impacts to the resources and uses of the Monterey Bay area. Table XX summarizes these potential impacts in comparative form.

on Resources and Uses

(a) Potential Impact to Resources

	Biological							Physical				Historical			
	Existing Protected Areas	Primary Productive	Benthic Invert.	Fish	Turtles	Seabirds	Marine Mammals	Chert/Artifact	Water Quality	Canyon	Keop	Intertidal	Wetlands (Shoqpa)	Shipwreck	Marine Cultural
Oil and Gas	●	●	●	●	●	●	●	●	●	●	●	●			
Discharges within	●	●	●	●	●	●	●	●	●	●	●	●			
Discharges that enter	●	●	●	●	●	●	●	●	●	●	●	●			
Industrial	●	●	●	●	●	●	●	●	●	●	●	●			
Airborne of etc. the Seabird	●	●	●	●	●	●	●	●	●	●	●	●			●
Mammals, Birds, Turtles					●	●	●								
Overflights	●				●	●	●								
Thru Craft	●				●	●	●								
Status Quo	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

Legend

●	Potential Positive Impact
■	Potential Negative Impact

B. Oil, Gas and Mineral Activities

1. Status Quo

a. Existing Regulatory Framework

Under this alternative the resource protection regime would rely on the Department of the Interior's Outer Continental Shelf (OCS) Natural Gas and Oil Comprehensive Program 1992-1997, the proposed Sanctuary regulatory and management framework, and existing Federal statutes to provide protection to the Sanctuary's resources.

Department of the Interior, MMS, final rule for oil and gas and sulphur operations in the OCS; (30 CFR Parts 250 and 256) provides the regulatory regime for more performance standards and new and updated requirements for operational and environmental safety. The use of Best Available and Safest Technologies is required by the Director of MMS to help prevent significant effects on safety, health or the environment (30 CFR Part 250.22). Numerous regulations exist to help prevent blowouts during the different phases of oil and gas activities and which require adequately trained personnel during OCS operations.

Environmental review and the opportunity for the public comment take place prior to any hydrocarbon production under the provisions of the Outer Continental Shelf Lands Act and the National Environmental Policy Act. In addition, all lease sale activities in the OCS would require consistency with the State of California Coastal Zone Management Plan. ~~The current OCS Oil & Gas 5-Year Leasing Plan includes Lease Sale 119 and is currently at~~

~~the stage of gathering information for the preparation of a DEIS for the Lease Sale. The tracts considered for leasing are in the northern area of the proposed Sanctuary.~~

If areas within the Sanctuary are leased for hydrocarbon activities in the future, NOAA has authority to condition or deny approval for, as necessary, permits or other authorizations granted to operators (lessees or contractors) by other authorities for activities which are otherwise prohibited under Sanctuary regulations. Such conditions may include, but are not limited to, the establishment of a monitoring program and scientific research studies to measure the effects of hydrocarbon activities on Sanctuary resources and the restriction of discharges. Any conditions imposed by NOAA on other authorities' permits would be made in consultation with those agencies and the permittees.

Finally, NOAA has the ability to enact emergency regulations to prohibit hydrocarbon activities, or any other activities, 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, on a temporary basis.

b. Impact to Resources

Future Lease Sale Plans in the central California Planning area and associated development may occur close to shore, near sensitive haul-out areas and in highly productive marine waters that are all part of the Monterey Bay ecosystem. The nationally recognized, sensitive marine resources of the Monterey Bay area, however, warrant more comprehensive, long-term protection from

adverse environmental effects of oil spills, discharges and, noise and visual disturbance.

For example, a group of Año Nuevo Basin tracts off San Mateo County, approximately 10 nmi due west of Año Nuevo, were scheduled to be included in MMS's Lease Sale #119 and are known to be of high oil and gas resource potential (Mullins and Nagel, 1982) (Figure XX). Due to the unique nature and environmental sensitivity of areas such as off of Año Nuevo it seems additional safeguards are necessary to protect the proposed Sanctuary's resources and qualities. Presently, no administrative mechanism exists to permanently set aside such an important area. For each sale, all tracts not already leased are reconsidered.

A recent NAS study (NAS, The Adequacy of Environmental Information for Continental Shelf Oil and Gas Decisions: Florida and California, 1989) as well as past EPA (1983) and NAS (1985) studies have all examined whether there is adequate information available to determine the effects of oil and gas activities on the marine environment. Although many uncertainties still exist, experience from recent oil spills shows massive destruction to all levels of the marine environment from coating of rocks and subsequent loss of encrusting organisms, to fouling of birds, pinnipeds and sea otters resulting in loss of thermoregulatory ability, poisoning from ingestion and death.

c. Impact to Uses

Development of the OCS for oil and gas resources will include an increase in the number of offshore platforms. Associated with

this direct development will be numerous indirect increases in human activities such as increase in vessel traffic, either servicing the platforms or transporting oil (unless pipelines are used to offload the discovered resources), increases in overflights from helicopters, increasing levels of discharges, and increased urban development. It is possible for this potential development to have a negative impact on fishing in the area and on recreational and tourist activities.

2. Sanctuary Alternative 1

a. Sanctuary Action

Under this alternative, a regulation could be promulgated prohibiting oil, gas and mineral activities within discrete areas in the Sanctuary. These areas could include, but are not limited to, geographical zones around Areas of Special Biological Significance, State Reserves, Beaches, Parks or other marine areas and habitats that are especially fragile and vulnerable to the effects of oil and gas activities. In addition, hydrocarbon activities maybe restricted and only permitted if executed with discharge and/or monitoring requirements. The monitoring requirement would be similar to the following:

Within specified areas of the Sanctuary the operator (lessee) is required to submit a monitoring plan to assess the effects of oil and gas exploration, development and operations on the biotic communities of the Sanctuary. Monitoring investigations are to be conducted by qualified, independent scientific personnel, these personnel and all required equipment must be available at the time of operations. The monitoring team must submit its findings to the Minerals Management Service Regional Director (RD) (Pacific OCS Office) and the SRD in accordance with a pre-established schedule.

The findings must be submitted immediately in case of imminent danger to the biota of the Sanctuary resulting from drilling or other operations. If it is determined by the RD, in consultation with the SRD, that surface disposal of drilling fluids presents no danger to the Sanctuary, no further monitoring of that particular well or platform is required. If, however, the monitoring program indicates that the biota of the Sanctuary are being harmed, or if there is any likelihood that a particular well or platform may cause harm to the biota of the Sanctuary, the RD and SRD shall require implementation of mitigating measures such as: (1) the disposition of all drill cuttings and fluids by barging, or by shunting the material through a down pipe that terminates an appropriate distance, but no more than 10 meters, from the bottom, or (2) other appropriate operational restrictions.

This regulation would also require that a formal interagency consultation process between the SRD and MMS be established to oversee the monitoring process with the Sanctuary.

b. Impact to Resources

Many of the impacts discussed above under the Status Quo regime would still apply although particularly sensitive areas would be protected by eliminating development in specific zones around resources most at risk.

c. Impact to Uses

Increases in human activities associated with offshore oil and gas development would still occur although at potentially reduced magnitudes. Conversely the predicted negative impacts to fishing and recreational activities would be reduced.

3. Sanctuary Alternative 2 (Preferred)

a. Sanctuary Action

Exploring for, developing, or producing oil, gas or minerals is prohibited in the Sanctuary

b. Impact to Resources

The resources and qualities of the Monterey Bay area, particularly sea otters, sea birds, and pinnipeds that use the haul-out sites, kelp forests and rocks along the Monterey Bay coast, and the high water quality of the area, are especially vulnerable to oil and gas activities in the area. A prohibition on oil and gas activities within the proposed Sanctuary boundaries will provide partial protection from oil and gas activities for the resources and qualities within the proposed boundaries. Only partial protection would be provided due to the remaining threat from oil and gas activities outside of the Sanctuary boundaries and from vessel traffic, particularly oil tankers, transiting through and near the Sanctuary. A prohibition on mineral activities within the proposed Sanctuary is necessary to be consistent with the prohibition regulation on alteration of or construction on the seabed as discussed below.

The proposed regulation will prohibit activities in the Sanctuary which might otherwise result in chronic discharges, catastrophic oil spills, and various other activities associated with petroleum development which may harm wildlife (including many endangered species) within some of the primary foraging waters surrounding the major bird and pinniped rookeries and resting places in the area. The proposed prohibition of hydrocarbon activities will ensure continued absence of leasing in the currently deferred Federal OCS areas off Monterey and Big Sur and deferred state waters and add an additional layer of protection to

environmentally sensitive areas such as off Año Nuevo.

While it is clear that the natural resources and qualities of Monterey Bay are of National significance and value, scientific evidence and public opinion are still divided regarding the effects of oil and gas activities on these natural resources and qualities. Due to the mandate of the MPRSA to protect these Nationally significant natural resources and qualities and the identified risks to these resources, NOAA is proposing to eliminate concern for any adverse environmental impacts that may occur in the Sanctuary from oil and gas activities by prohibiting these activities within the proposed Sanctuary boundary (approximately 2,539 square nmi).

c. Impact to Uses

There is presently no oil and gas development taking place in the study area. Lease Sale 119 has been canceled and no additional Lease Sales activity is proposed up to the year 2000. This prohibition would eliminate all future potential direct and indirect oil and gas industry activities in the area. However, activities such as tourism and fishing should be beneficially impacted.

C. Discharges or Deposits

1. Status Quo

a. Existing Regulatory Framework

Numerous laws and regulations administered by many local, state and Federal agencies exist governing the contamination of ocean waters by discharges and deposits from a variety of sources, including, but not limited to: 1) discharges from point sources (which require a National Pollutant Discharge Elimination System (NPDES) permit) (e.g. power, industrial, desalination and municipal wastewater treatment plants and oil and gas platforms); 2) discharges from non-point sources, (e.g. urban and agricultural runoff); 3) discharges of oil and hazardous substances (e.g. oil from vessel bilges and toxic chemicals) and overboard trash disposal (e.g. discarded fishing nets and plastic trash) and 4) ocean dumping e.g. (dredge material from harbor channels).

The primary Federal, state and local laws, policies and plans governing discharges, include but are not limited to: the Federal Water Pollution Control Act (the "Clean Water Act", CWA); the Marine Protection, Research, and Sanctuaries Act (MPRSA); the Coastal Zone Management Act (CZMA); the Rivers and Harbors Act; the Act to Prevent Pollution from Ships, (and MARPOL, Annexes I-V); the Marine Plastic Pollution Research and Control Act; the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) including the National Contingency Plan; EPA's Administrative Regulations; the State of California Water Code, including but not limited to the California Porter-Cologne Water

Quality Act; the Fish and Game Code; the California Harbors and Navigation Code; the California Ocean Plan; the California Enclosed Bays and Estuaries Plan; the Water Quality Control Plan-San Francisco Bay Basin Region (2); the Water Quality Control Plan-Central Coast Basin Region (3).

Responsible agencies for implementing appropriate regulations and plans, include but are not limited to, the National Oceanic and Atmospheric Administration ("NOAA"), the U.S. Environmental Protection Agency ("EPA"), the U.S. Corps of Engineers ("COE"), the U.S. Coast Guard ("USCG"), the California State Water Resources Control Board ("State Board"), the California Regional Water Quality Control Board, Central Coast Region ("Regional Board, Central Coast Region"), the California Regional Water Quality Control Board, San Francisco Bay Region, ("Regional Board, San Francisco Bay Region"), the California Coastal Commission ("CCC"), and the Association of Monterey Bay Area Governments ("AMBAG").

(1) Point Source Discharges

NPDES permits are required by all dischargers, municipal and industrial, that discharge to "waters of the Nation". The SWRCB and the RWQCBs are responsible for the protection of the quality of the State's waters through the development of water quality control plans and the issuance of waste discharge orders. Pursuant to Section 402 of the CWA and Section 13370 of the California Water Code, EPA has approved the State's program to issue and enforce NPDES permits to ensure, to the greatest extent possible, that discharges to surface waters do not adversely affect the quality

and beneficial uses of the such waters. The State issues NPDES permits in accordance with a Memorandum of Agreement (MOA) between the EPA and the State Board. Regional Board staff prepare the permit and the State Board and EPA may comment upon, or object to the issuance of, a permit or the terms and conditions therein. Neither the State Board not the regional Boards adopt or issue an NPDES permit until all objections have been resolved pursuant to 40 CFR 123.44 and the MOA.

(2) Non-Point Source Discharges (NPS)

EPA has provided the State of California guidance on implementing the provisions of EPA's Antidegradation Policy (40 CFR 131.12) which is applicable to Non-Point Source (NPS) Pollution as well as Point Source Pollution. Specifically, "where high quality waters constitute an outstanding National resource, such as waters of National and State Parks and wildlife refuges and waters of exceptional recreational or ecological significance, that water quality shall be maintained and protected" (40 CFR 131.12 (a)(3)). The NPS provisions of the CWA 205(j), 208, 303(e) and 319 are subject to the antidegradation policy and EPA is developing additional guidance in this area.

AMBAG has prepared a Non-Point Source Pollution Program Manual pursuant to the CWA 208 studies, with recommendations to guide local governments and other agencies in preparing effective control ordinances and BMPs for erosion and sedimentation, and urban and agricultural runoff, and is continuing to manage studies on non-point source pollution under the CWA 205J.

The State of California's 319 Non-Point Source Pollution Plan approved by EPA pursuant to the CWA identifies within State coordination for NPS by SWRCB to be with the U.S. Agricultural Stabilization and Conservation Service, U.S. Soil Conservation Service and California Department of Transportation. Under the 319 Plan it is predicted that the Regional Boards will develop policy for NPS from (1) voluntary implementation of Best Management Practices (BMP) (such as those enumerated for NPS agricultural and urban issues in the Report to Congress: "NPS Pollution in the United States, Report to Congress, 1984"), (2) Regulatory based encouragement of BMP's, and (3) effluent limitations.

The CCC retains permanent jurisdiction and requires a coastal development permit for actions over lands of the coastal zone including the immediate shoreline (tidelands, submerged lands, and public trust lands) under the provisions of the California Coastal Act (CCA) of 1976 (Cal. Pub. Res. Code 3000 et seq.) pursuant to the authority of the CZMA. In addition, the CCC retains appeal jurisdiction for certain types of development in certain areas where a local government has a certified Local Coastal Program (LCP). Several of the CCC policies provide special consideration to the resources and qualities of the Sanctuary including but not limited to, (1) providing special protection to areas and species of special biological or economic significance, and requires that uses of the marine environment shall be carried out in a manner that will maintain biological productivity (CCA, Section 30230), (2) limits dredging and filling in coastal waters to situations

where "there is no feasible less environmentally damaging alternative" and where is related to specific listed purposes (CCA, Section 30233), (3) authorizes the protection of environmentally sensitive habitat areas "against any significant disruption of habitat values" and against impacts from adjacent development which would "significantly degrade" the area (CCA, Section 30240), (4) considers the secondary impacts resulting from the increase in power production needs for desalination plants (CCA, Section 30253(4)).

Finally, the Omnibus Budget Reconciliation Act, 1990, P.L. 101-508, Section 6217(g) requires the Administrator of EPA in consultation with the Secretary of Commerce and the U.S. Fish and Wildlife Service and other Federal Agencies, to publish guidance for specifying management measures for sources of NPS in coastal water for each state with an approved coastal zone Management Program; and Section 6217(b) requires the State to provide for implementation, at a minimum, of management measures in conformity with the guidance of (g) and implemented through the State coastal zone management program under the CZMA, and the section 319 program under the CWA to protect coastal waters from non-point source pollution from adjacent coastal land uses, and to protect designated critical areas through additional management measures.

(3) Hazardous waste, oil and trash disposal

Discharges of oil and chemical waste are regulated under provisions of the Act to Prevent Pollution from Ships of 1980, as amended in 1982 and 1987 (33 U.S.C. §§ 1901 et seq.) and under

CERCLA, with the Coast Guard designated as the lead agency for implementation of procedures under the National Contingency Plan in coastal and ocean waters.

On October 27, 1988 the USCG announced a Notice of Proposed Rule Making that would implement the pollution prevention requirements of Annex V of the International Marine Pollution Convention, MARPOL 73/78 (53 FR 43622). These proposed regulations are expected to reduce the incidence of discharges of plastics and other ship-generated garbage into the marine environment.

(4) Ocean dumping

The COE has permitting authority over dumping of dredged material in coastal and open ocean (section 103 of the MPRSA) with determination to issue a permit being subject to review and approval by EPA, while section 404 of the CWA controls the actual discharge of dredged or fill material.

Under Title I of the MPRSA regulation of ocean dumping provides for special recognition of Nationally significant marine areas, such as marine sanctuaries under Title III.

b. Impact to Resources

Although water quality in the Monterey Bay area is considered to be good there is evidence of potential water quality limited segments and there exists an increasing public demand to address the decline in the health and productivity of our Nation's coastal and ocean resources. It has been recommended by the U.S. Office of Technology Assessment that it is necessary to identify waterbodies needing additional management such as the Monterey Bay area where

increased population pressure on the coastal zone and associated point and non-point sources of pollution such as toxics and nutrients, threaten the water quality and all resources of the Monterey Bay area without additional deliberate protection.

Benthic habitats will continue to be threatened by proposed designation and use of ocean disposal dump sites in the Sanctuary. Water quality is threatened from existing and proposed nutrient and metal loading from sewage treatment plants. Point and non-point sources pollution has also caused the closure of shellfishing beds in the Monterey Bay area and continues to threaten productive coastal habitats such as estuaries and sloughs through eutrophication and toxic loadings of metals, pesticides and herbicides. Coastal and offshore species of fish, seabirds and marine mammals, particularly the sea otter, are threatened from garbage and disease from contaminated food and contact with pathogenic organisms.

Proposed desalination plants in the Monterey Bay area would cause a variety of potential environmental impacts depending on the final location and type of operation. A seawater desalination plant requires a coastal groundwater or ocean source of water, a means of disposing of the waste brine, which may require an outfall pipe and a distribution system of the potable product water.

Operation of a desalination plant causes a complex discharge to the ocean environment from pre-treatment of the feedwater, effluent from pipeline flushing, Reverse Osmosis (R/O) membrane cleaning solutions, and the disposal of concentrated brines.

According to the DEIR for the City of Santa Barbara's Temporary Emergency Desalination Project there are several chemicals used during the desalination process which could pose a hazard to the environment including, chlorine, sulfur dioxide, sodium hydroxide, ferric chloride, carbon dioxide, antiscalent, zinc orthophosphate, and polyelectrolyte.

Pretreatment of feedwater involves not only filtering to remove sand and other particulate matter but also addition of chlorine and carbon dioxide for Ph reduction and ferric chloride for coagulation of suspended solids. Frequent (once every three days) filter backwashing and membrane cleaning with alkaline cleaners remove organic fouling. Brine disposal involves discharge of seawater at approximately 1.8 times background seawater salinity.

The discharge from the plume, as well as any pipelines may also alter the natural currents in the area. Air emission would also increase due to the production of energy for use in desalination plants.

c. Impact to Uses

The status quo will continue to provide for increasing urban and agricultural use adjacent to the Monterey Bay area which in turn will cause additional sources of point source and non-point source pollution. Urban population increases are predicted in the coastal zone of Monterey Bay and agricultural land use is expected to continue at least at current levels under the status quo. The status quo regime for discharges will not negatively impact these

uses of the Monterey Bay area based on considerations of the cumulative impact of these activities on the resources and qualities of the Monterey Bay area ecosystem.

Desalination plants not only have the impact of producing freshwater for local communities but may also have the side-effect of disturbing recreational activities in vicinity of the area. In addition proposals to mix the discharge effluent with existing municipal dischargers may cause difficulties with enforcement because the recipient of the desalination discharge will become responsible for the compliance with the regulatory requirements.

2. Sanctuary Alternative (Preferred)

a. Sanctuary Action

Discharging or depositing, from within the boundaries of the Sanctuary, any material or other substance is prohibited except:

- (1) fish, fish parts, chumming materials or bait used in or resulting from normal fishing operations in the Sanctuary;
- (2) biodegradable effluent incidental to vessel use generated by marine sanitation devices ~~approved by the U.S. Coast Guard~~ in accordance with the Clean Water Act Section 312, 42 USC 1322 et seq.;
- (3) water generated by routine vessel operations (e.g., cooling water, greywater and deck washdown) excluding bilge pumping;
- (4) engine exhaust;
- (5) sinkable training devices and ordinance discharges by the U.S. Military in designated Military operating areas;
- (6) routine discharges associated with mariculture operations at magnitude, frequency and quality levels existing as of the date of designation;
- (7) routine discharges associated with mariculture operations after the date of designation provided the mariculture operation is certified by NOAA in accordance with Section 944.10;
- (8) dredge material disposed of at the designated SF 12 and SF 14 dump sites off of Moss Landing at existing

magnitudes, qualities and frequencies and provided such disposal is certified by NOAA in accordance with Section 944.9. All new disposal of dredge material within the Sanctuary and designation of new dump sites is prohibited;

(9) point source discharges from, including but not limited to, municipal waste water treatment, power, desalination and industrial plants provided such discharge, if existing as of the date of designation, is certified by NOAA in accordance with Section 944.9 and if after the date of designation, is certified by NOAA in accordance with Section 944.10. NOAA encourages existing facilities to decrease their discharge and increase their performance due to the presence of a National Marine Sanctuary. Municipal treatment plants will be required to have at least secondary treatment capabilities and tertiary or greater as appropriate or necessary depending on the risk to Sanctuary resources and qualities. The cities of Santa Cruz and Watsonville, which currently discharge primarily treated sewage, would therefore be required to upgrade to at least secondary treatment. Discharge by these cities at primary levels of treatment will be allowed until expiration of existing permits. Upon requests for renewal of their permits in accordance with Section 944.9 NOAA will require, as a condition of certification, that the treatment be upgraded to at least secondary levels.

(10) New discharges from desalination facilities will not be prohibited, but rather will be subject, in consultation with appropriate local, state and federal regulatory agencies, to NOAA review and approval in accordance with Section 944.10.

Discharging or depositing, from beyond the boundaries of the Sanctuary, materials or other substances, other than those listed in (1-10) above, that subsequently enter the Sanctuary and injure a Sanctuary resource or Sanctuary quality is prohibited.

b. Impact to Resources

The intent of this prohibition is to protect the Sanctuary resources and qualities from the harmful effects of land and sea-generated non-point and point source pollution, such as but not limited to, trash and oil disposal by vessels and pollutant loading from adjacent urban and rural land use practices.

By maintaining the high water quality of the Monterey Bay area

the organisms responsible for primary productivity at the base of the food chain will be protected. Coastal wetland, slough and estuarine habitats will be protected from the direct affects of pollutant loadings. Benthic biota will be protected especially from smothering and turbidity increases from the dumping of dredge material. Fish, seabirds, turtles and marine mammals will be protected from direct negative impacts such as entanglement in discarded trash and infection from degraded water quality and benefit from the indirect affects of protected habitats and enhanced prey abundance.

c. Impact to Uses

Overall the impact of this regulation on human uses as well as the Sanctuaries resources and qualities is expected to be beneficial. No existing human uses will be terminated with designation and in the long-term many activities such as fishing, mariculture and tourism will continue to benefit from the maintenance of the high water quality of the area.

NOAA will work within the existing process, rather than create a new regulatory review and approval procedure, governing discharge activities in the Monterey Bay NMS area and coastal watersheds. Thus, NOAA intends to minimize any additional administrative burden on those dischargers that are required to obtain a National Pollutant Discharge Elimination System (NPDES) permit or a Waste Water Discharge Requirement (WDR) permit for discharges that affect or may affect the Monterey Bay NMS while at the same time ensure the existing process addresses the special concerns of the

Sanctuary and its resources and qualities.

In addition, a close working relationship between the Sanctuary and existing authorities and affected users will necessitate the identification and exchange of information relevant to the parties mutual goals for the maintenance of the area's high water quality and the protection and conservation of natural resources and qualities of the Monterey Bay area.

NOAA is in the process of developing a Memorandum of Agreement (MOA) between Federal, State and Local water quality management agencies to determine specific procedures by which the goals of the Sanctuary would be achieved by using the existing discharge permitting process. NOAA intends to work at the earliest stages of the permit application process, such as during the preparation of required environmental impact analyses, with both the relevant discharge authorities and the applicant in an effort to understand and address mutual concerns and accomplish the parties varying objectives.

Consistent with the MPRSA primary objective of protecting the Sanctuary and its resources, section 301(b)(5) of the MPRSA, 16 U.S.C. § 1431(b)(5), the Sanctuary regulations address discharges within the Sanctuary boundary (15 CFR 944.5(a)(2)) as well as those discharges outside of the Sanctuary boundaries which may enter and injure Sanctuary resources and qualities (15 CFR 944.5(a)(3)). All discharges classified under the CWA as "discharges into the waters of the Nation" are included under the scope of Sanctuary designation 15 CFR 944.5(a)(2)-(3).

In accordance with section 304(c)(1) of the MPRSA, 16 U.S.C. § 1434(c)(1), NOAA may regulate existing permits through certification which may include imposition of terms and conditions consistent with the purposes for which the Sanctuary is designated. Regulation of new discharge permits issued after the date of designation will be subject to the review process which may include added terms and conditions or objection to issuance, as necessary to protect Sanctuary resources and qualities. Any application for an amendment, renewal or extension to an existing discharge permit will be considered as a new discharge permit.

Specific impacts to uses of the area that involve discharge into the Sanctuary area are discussed in more detail below.

(1) Vessels

The impact of this regulation on vessel operations is expected to be minor. Oil discharges are presently regulated under the Clean Water Act. Where it pertains to oil discharges, this regulation would increase the penalties for violations.

Non-biodegradable and other potentially harmful trash will have to be kept on boats and disposed of at proper facilities, most likely on the mainland. The exceptions to this regulation are designed to allow continued use of the Sanctuary by vessels that do not appear to threaten Sanctuary resources and qualities. Thus, fish, fish parts, and bait used in or resulting from normal fishing operations within the Sanctuary, exhaust, vessel cooling waters, and approved marine sanitation wastes are specifically exempted from the prohibition.

(2) Dredge Disposal Activities

The regulation would allow, with NOAA certification, existing disposal of dredge material at current magnitudes, quality and frequencies at existing disposal sites off of Moss Landing and only prohibit proposed additional dumping and the disposal of dredge material within the sanctuary.

NOAA is consulting with EPA, the State Water Resources Board and Regional Water Quality Control Board and Harbor Masters regarding existing dredge and disposal activities within the vicinity of the proposed Sanctuary. Dredging activities in harbors will not be affected by Sanctuary designation as harbors are not included within the Sanctuary boundaries and maintenance dredging at existing magnitudes and frequencies in the Sanctuary is exempt from the Sanctuary regulations. NOAA can work within the existing regulatory process to ensure that the requirements for ocean dredge disposal at existing sites are in place, enforced and adequate to protect the resources of the Sanctuary. The Sanctuary requirement of certification of existing permits will assure review for possible impacts without imposing undue burdens, however, the regulation may impose additional costs by requiring the use of more expensive methods of dredge disposal or even disposal at alternative sites on land if evidence shows that current dredge disposal activities injure Sanctuary resources and qualities.

(3) Point Source Discharges

Discharges and deposits from point sources into the Sanctuary, pursuant to any permit executed as of the effective date of these

regulations, are allowed subject to all prohibitions, restrictions and conditions validly imposed by any other authority of competent jurisdiction, provided however, that NOAA may regulate the exercise of these existing permits as necessary to achieve the purposes for which the Sanctuary was designated.

In consultation with scientific institutions and local, State and regional organizations such as the Association of Monterey Bay Area Governments, NOAA will consult with the permittees and the relevant permitting authorities of these activities to determine means of achieving the Sanctuary purposes. If additional constraints are necessary, NOAA will work with the permittees and permitting authorities to determine the necessary level of conditions to provide adequate protection of the proposed Sanctuary's resources and qualities.

The requirement of NOAA certification of existing permits for municipal sewage, industrial and power plants will ensure NOAA consideration of potential impacts on Sanctuary resources and qualities. The NOAA certification process will be coordinated with EPA and State and Regional Water Quality Control Boards.

New proposals for permits, licenses, or other authorizations after the effective date of Sanctuary designation allowing the discharge of municipal sewage, industrial, power, or desalination effluent will be subject to Sanctuary regulatory prohibitions to ensure that Sanctuary resources and qualities are protected from injury.

When existing permits are submitted for renewal, and reviewed

as a new permit, NOAA will evaluate the activity to determine the extent of any negative effects to water quality or natural resources and whether the activity has complied with its permit standards and potentially decreased its discharge and increased its performance due to the presence of a National Marine Sanctuary.

Consistent with the antidegradation policy for outstanding national resource waters only new point source dischargers, including desalination activities, that are proven by the discharger to maintain the existing water quality and do not injure Sanctuary resources or qualities would be allowed. In addition, and consistent with the Clean Water Act the Sanctuary will require at least secondary treatment and preferably tertiary or greater for municipal treatment plants depending on the risk to Sanctuary resources and qualities.

The cities of Santa Cruz and Watsonville, which currently discharge primarily treated sewage, would therefore be required to upgrade to at least secondary treatment. Discharge by these cities at primary levels of treatment will be allowed until expiration of existing permits. Upon requests for renewal of their permits NOAA will require, as a condition of certification, that the treatment be upgraded to at least secondary levels.

New discharges from desalination facilities will not be prohibited, but rather will be subject, in consultation with appropriate local, state and federal regulatory agencies, to NOAA review and approval.

This regulation could thus result in additional costs to

existing and future dischargers if the Sanctuary were to determine that a higher level of treatment or other, more expensive disposal methods were preferable in order to ensure Sanctuary resources and qualities are protected. However, the requirement of Sanctuary certification or other approval of permits for point source dischargers will ensure that these potentially harmful activities receive special consideration from the Sanctuary viewpoint.

(4) Non-Point Source Discharges (NPS)

Land based NPS discharges within watersheds adjacent to the Sanctuary that drain into the Sanctuary would be monitored to ensure the activity is consistent with the goals of the Sanctuary and that Sanctuary resources and qualities are protected. If evidence arises that Sanctuary resources and qualities are threatened, NOAA intends to work with existing regulatory agencies and responsible parties to determine appropriate measures to prevent the threat of injury to Sanctuary resources and qualities.

As existing mariculture and aquaculture sites do not seem to pose a threat to Sanctuary resources and qualities at current magnitude, quality and frequency of discharge, these activities are exempt from the regulation and no certification of existing permits is required. However, to ensure that any new and proposed mariculture and aquaculture sites, after the effective date of Sanctuary designation, also do not threaten Sanctuary resources and qualities due to discharges into the Sanctuary, they would be regulated by the Sanctuary in accordance with Section 944.10.

D. Historical Resources

1. Status Quo

a. Existing Regulatory Framework

Under this alternative any historical resources (as defined by Sanctuary Program and Sanctuary regulations to include, inter alia, archeological, paleontological, or cultural resources) would remain subject only to the existing management regime, including the National Historic Preservation Act of 1966 (NHPA), 16 U.S.C. 470 et seq., the Archeological and Historical Preservation Act of 1974, 16 U.S.C. 469 et seq., the Abandoned Shipwreck Act (ASA) of 1987, 43 U.S.C. 2101 et seq., and the Archeological Resources Protection Act of 1979 (ARPA), 16 U.S.C. 470aa et seq., and with permits provided by the State Lands Commission for those historic resources in State waters, pursuant to the Shipwreck and Historic Maritime Resources Program of 1989, enacted by the State legislature as Chapter 732, in accordance with the ASA.

b. Impact to Resources

Existing regulatory authorities provide some protection for underwater historical or cultural resources. California can register sites as either "points of interest" or "land marks", and the latter designation provides some protection to sites in State waters.

Proposed guidelines published by the National Park Service (54 FR 13641) would assist the states and Federal agencies in developing legislation and regulations to carry out their management responsibilities regarding shipwrecks in accordance with

the provisions of the ASA.

The NHPA mandates that federal agencies consult with and Advisory Council on Historic Preservation before engaging in any undertaking that could effect historic resources. Consultation with the expertise of this Council provides Federal agencies with an opportunity to ensure their proposed activities are technically adequate and that any plans to salvage historic resources take into account preservation requirement for the long-term protection of the resources.

The State Lands Commission in association with the State Historic Preservation Officer (SHPO) can nominate appropriate sites and vessels for listing on the National Register of Historic Resources. In an agreement with the University of California the SLC has begun a computer inventory of more than 1500 sites in State waters to provide further research on these sites and vessels and to determine their historic significance.

However, there would be minimal impact or special recognition and protection to other associated resources and the site's environmental integrity, such as benthic biota and fish communities.

c. Impact to Uses

Salvage operations in State waters must also be permitted by the State Lands Commission. Registration on the National Register of Historic Sites provides protection only against Federal and not private activities such as wreck divers and treasure salvors.

2. Sanctuary Alternative (Preferred)

a. Sanctuary Action

Moving, Possessing or injuring, or attempting to move, or injure, a Sanctuary historical resource is prohibited. This prohibition does not apply to accidental moving, possession or injury during normal, routine, fishing operations.

b. Impact to Resources

Under this alternative, moving, possessing, or injuring or attempting to move, or injure a Sanctuary historical resource would be prohibited without NOAA approval and issuance of a Sanctuary permit. Sanctuary management of historical resource under the authority of the MPRSA shall be consistent, to the extent practicable, with the Federal archeological program by consulting the Uniform Regulations, ARPA (43 CFR Part 7), the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation (48 FR 44716, Sept. 29, 1983) and other relevant Federal regulations. NOAA also intends to work closely with the CA State Lands Commission and the SHPO regarding approval to move, injure or possess abandoned shipwrecks, title to which is held by the State of California.

Any historical resources known to be within the proposed Sanctuary, especially those that are on the National Register listing under the National Historic Preservation Act, would be carefully monitored by Sanctuary staff. In addition, any activity that could lead to the discovery of historical resources would be carefully monitored. The Sanctuary Manager would try to ensure that adequate information is available regarding the national significance of these resources and appropriate management measures

are in place.

This regulation would apply throughout the Sanctuary in order to protect these valuable resources for research and interpretation. In addition, during its review and approval of a request for a Sanctuary permit NOAA would consider the impacts of the proposed activity on adjacent Sanctuary resources and qualities such as benthic communities and associated fish populations.

c. Impact to Uses

Human activities that normally "take" a historical resource would also require a Sanctuary permit. Such a permit would only be given under specific circumstances such as for research or education purposes. Where this responsibility overlaps with other state and Federal agencies the Sanctuary would coordinate its review of permit request with the appropriate agency.

As only a few uses "take" historical resources, such as Navy and treasure salvors and recreational divers, the impact of this regulation is expected to be minor.

E. Alteration of or Construction on the Seabed

1. Status Quo

a. Existing Regulatory Framework

Section 10 of the Rivers and Harbors Act; Section 404 of the Clean Water Act; the Title I of the Marine Protection, Research, and Sanctuaries Act; the Submerged Lands Act; the Outer Continental Shelf Lands Act; the State Porter-Cologne Water Quality Act; and the California Coastal Act.

The primary Federal agencies affected include but are not limited to, the U.S. Corps of Engineers and EPA; and the primary state agencies include but are not limited to, the State Lands Commission and the California Coastal Commission (CCC).

b. Impact to Resources

Under this alternative the benthic resources and the various substrates of the Sanctuary would continue to be protected only by the existing management regime. Existing State and Federal regulations governing activities on the seabed would still apply. There would be no special emphasis on the importance of the seabed as an environment that provides a variety of habitats that in turn supports the rich colonies of kelp and other algae, benthic invertebrates and associated organisms dependant upon these habitat assemblages.

For example, desalination, municipal, power and industrial plant operation can cause seafloor disturbance, increased turbidity and damage to kelp beds during pipeline construction and maintenance. Construction impacts from desalination and municipal

plants could result in disturbance to seabirds and marine mammals; air pollution emissions; obstruction of views caused by machinery, piping or tall structures; loud noises; disturbance to archaeological and paleontological resources; erosion; non-point source pollution; and disturbance of dune, surf zone and sea floor ecology. The building of harbor breakwaters and piers and jetties can smother benthic habitat and alter current patterns in the immediate vicinity.

Finally, sand mining, dredging and dredge disposal activities cause loss of sediment and associated disruptions in benthic communities from erosion of habitat and smothering of organisms from increased turbidity and particle deposition.

Although, the CCC limits dredging and filling in coastal waters to situations where "there is no feasible less environmentally damaging alternative" and where it is related to specific listed purposes, under the status quo no one agency reviews the impacts of these activities on a cumulative basis or from the holistic perspective of the Sanctuary ecosystem.

c. Impact to Uses

Harbor maintenance activities are predicted to increase, including expansion, and dredging and disposal of material from slips and navigation channels. Sand mining activities are predicted to continue at least at current rates. The construction of pipelines and outfalls into the ocean is predicted to increase.

Continued alteration of the seabed can interfere with public access and recreation and loss of fish habitat and fishing grounds.

Erosion of dunes and beaches from sand mining may not only impact nature viewers and recreationists but may also interfere with long-term coastal development projects in the area.

2. Sanctuary Alternative (Preferred)

a. Sanctuary Action

Drilling into, dredging or otherwise altering the seabed of the Sanctuary; or constructing, placing, or abandoning any structure, material or other matter on the seabed of the Sanctuary is prohibited, except if any of the above results from:

- (1) anchoring vessels,
- (2) normal, routine, fishing operations,
- (3) installation of navigation aids,
- (4) maintaining mariculture operations existing as of the effective date of Sanctuary designation,
- (5) routine harbor maintenance, including dredging of harbor entrance channels;
- (6) construction of docks and piers;
- (7) sand mining activities existing as of the date of designation, at current frequencies and magnitudes, provided the activity is certified by the Sanctuary in accordance with Section 944.9. All new sand mining, including requests for renewal of existing activities, within the Sanctuary below mean high water is prohibited.

b. Impact to Resources

The intent of this prohibition is to protect the resources and qualities of the Sanctuary from the harmful effects of activities such as, but not limited to, archeological excavations, drilling into the seabed, strip mining, laying of pipelines and outfalls, ocean mineral extraction (including but not limited to sand mining), dumping of dredge spoils and offshore commercial development that may disrupt and/or destroy sensitive marine benthic habitats such as kelp beds, invertebrate populations, fish habitats, and estuaries and sloughs.

c. Impact to Uses

Existing permitted activities that cause alteration of or construction on the seabed, such as maintenance of seawalls and jetties, disposal of dredge material at existing sites at current rates, magnitudes and qualities, would continue but be regulated by the Sanctuary to ensure the activity is consistent with the purposes for which the Sanctuary was designated in accordance with Section 944.9.

New activities such as development of new breakwaters, new applications or requests for offshore commercial development projects such as, but not limited to, artificial reefs, or new mariculture and aquaculture sites would be regulated by the Sanctuary, in consultation with appropriate existing authorities and users, to ensure that Sanctuary resources and qualities are protected in accordance with Section 944.10.

As harbors are excluded from the Sanctuary boundaries all harbor activities within the exclusion zones would be exempt from the scope of regulation. In addition, routine harbor maintenance activities beyond the boundaries of the Sanctuary are exempted from this regulation. No new dredge disposal or designation of new sites would be allowed in the Sanctuary.

Consistent with the first prohibition on oil, gas and mineral activities within the Sanctuary no new sand mining would be allowed in the Sanctuary and requests for permit renewals for sand mining in the surf zone below mean high water would be prohibited.

F. Taking Marine Mammals, Turtles and Seabirds

1. Status Quo

a. Existing Regulatory Framework

The Marine Mammal Protection Act, Endangered Species Act, Migratory Bird Treaty Act (MBTA) 16 U.S.C. § 703-712.

Agencies involved include the National Marine Fisheries Service, the U.S. Fish and Wildlife Service, and the State Department of Fish and Game.

b. Impact to Resources

Under this alternative the Marine Mammal Protection Act (MMPA) and the Endangered Species Act (ESA) would provide some protection to the marine mammals, turtles and seabirds of the Sanctuary: both prohibit the taking of specific species protected under those Acts.

The MBTA codifies a series of conventions between the U.S. Great Britain, Mexico, Japan and the USSR providing complete protection of the migratory birds, and their nests and eggs from hunting, killing, selling and exploitation as defined in 50 CFR 10, 20 and 21. Exploitation of this resource is permitted only via permits.

These resources would continue to be protected on a species and case-by-case basis without consideration of their role in the ecosystem or under the special purview of the Sanctuary management regime.

c. Impact to Uses

All users of the Monterey Bay area are prohibited from taking any marine mammal or endangered or threatened seabirds and turtles

unless in possession of a permit. Fishing activities are specifically excluded from the provisions of the MMPA, ESA and MBTA.

2. Sanctuary Alternative (Preferred)

a. Sanctuary Action

Taking any marine mammal or turtle or seabird in or above the Sanctuary, except as permitted by regulations promulgated under the Marine Mammal Protection Act (MMPA) and the Endangered Species Act (ESA) is prohibited.

b. Impact to Resources

The term "taking" includes all forms of harassment. The MMPA and the ESA both prohibit the taking of specific species protected under those Acts. Sanctuary enforcement officials may consider harassment cases pursuant to the MMPA, ESA and MBTA.

The proposed prohibition would overlap with the MMPA, MBTA and ESA but also extend protection for Sanctuary resources on an environmentally holistic basis. It would include all marine mammals and turtles in the Sanctuary and seabirds in or above the Sanctuary.

c. Impact to Uses

Other than empowering Sanctuary officials to directly enforce the provisions of the MMPA, ESA and MBTA this regulation should not affect any additional users other than those already regulated.

However, upon violation of this Sanctuary regulation the MPRSA (Section 307) allows NOAA to assess civil penalties as high as \$50,000 for each violation. The status quo sets maximum financial penalties ranging between \$2,000 and \$25,000 per violation. Thus this regulation may add further deterrence to individuals from

violating this regulation. In addition, by directing civil penalties back into the Marine Sanctuary Program, a more directed effort can be implemented to protect these valuable natural resources.

G. Overflights

1. Status Quo

a. Existing Regulatory Framework

Federal Aviation Administration Regulations FAR 91 et seq. and State Department of Fish and Game regulations for particular sensitive areas.

b. Impact to Resources

FAR regulations are intended to provide for the safe operation and maintenance of aircraft rather than for protection of the environment. Low level overflights of ecologically sensitive coastal areas are known to cause disturbance and even fatalities of marine resources such as sea otters, pinnipeds and seabirds. Migrating and foraging cetaceans are also known to change their behavior patterns when approached by aircraft flying at low levels.

Some protection is provided by the State to areas such as the Año Nuevo Reserve, Point Lobos Reserve and the California Sea Otter Game Refuge by the Department of Fish and Game with overflight prohibitions below 1000 feet.

c. Impact to Uses

FAR regulations require safe operating altitudes and distances and specify that pilots are required to be more than 500 feet over water and higher than 500 feet within 500 feet of shore (FAR 91.119). Seaplane and floatplane operations in water are governed by the Coast Guard maritime regulations and by FAR's when airborne.

In addition, FAR regulations address careless and reckless operations, aircraft speeds, minimum altitudes and distances and

right-of-war rules as well as prohibitions on dropping of objects, alcohol and drugs and operation near other aircraft.

2. Sanctuary Alternative (Preferred)

a. Sanctuary Action

Flying motorized aircraft at less than 1000 feet above four designated zones within the Sanctuary is prohibited. Generally the zones are: (1) from mean high tide out to three nautical miles between a line extending from Point Santa Cruz on a southwesterly heading of approximately 220° and a line extending from 2.0 nmi north of Pescadero Point on a southwesterly heading of 240°; (2) from mean high tide out to three nautical miles between a line extending from the Carmel River mouth on a westerly heading of 270° and a line extending from 2.5 nmi southeast of Partington Point on a southwesterly heading of 240°; (3) from mean high tide and within a five nmi arc drawn from a center point at the end of Moss Landing Pier; and (4) over the waters of Elkhorn Slough east of the highway one bridge to Elkhorn Road.

b. Impact to Resources

The area-specific prohibition on overflights below 1000 feet (305 m) is designed to limit potential noise impacts, particularly those that might startle hauled-out seals and sea lions, sea otters or birds nesting along the shoreline margins of the Sanctuary. Intrusive overflights during sensitive biological periods would thus be minimized. The regulation would complement existing California Fish and Game overflight restrictions, over the California Sea Otter Refuge and Año Nuevo, extend this protection to areas north of Santa Cruz and around Año Nuevo and over sensitive estuarine areas particularly Elkhorn Slough and the mouths of the Pajaro and Salinas Rivers (Figure XX).

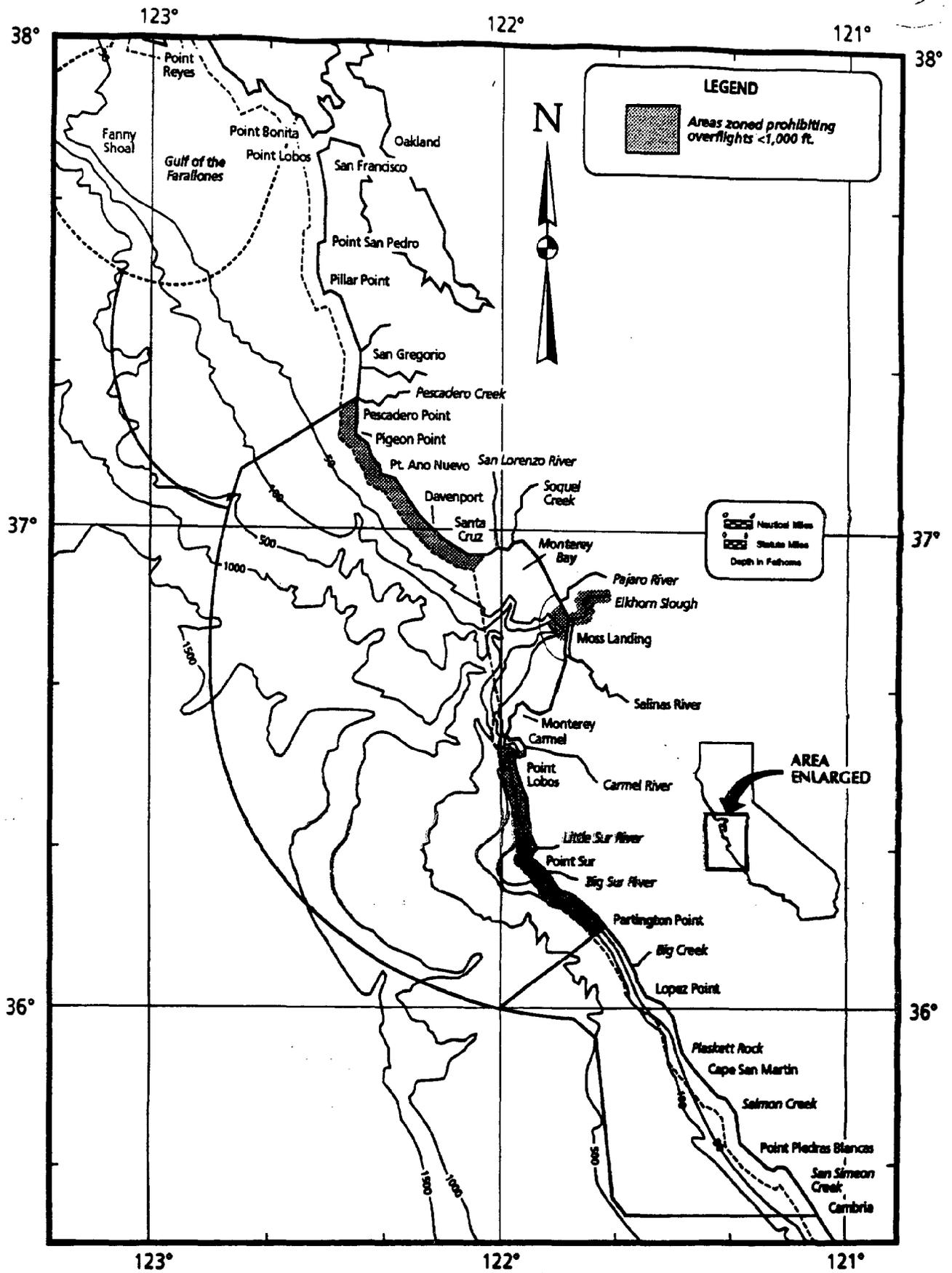


Figure 32. Areas Zoned Prohibiting Overflights less than 1,000 ft.

c. Impact to Uses

The prohibition zones were designated in part to minimize impacts to areas where frequent overflights occur less than 1000 feet especially over areas without high concentrations of marine resources. Thus, aircraft landing at or taking off from airports would not be affected and neither would seaplanes landing at or taking off from ocean moorings at Santa Cruz City Wharf and potentially in the future from the Monterey Harbor area.

In addition, overflights below 1000 ft within these zones would still be allowed if necessary to respond to an emergency threatening, life, property or the environment.

Aircraft that need to fly below 1000 feet within these zones for research purposes would require a Sanctuary research permit. Overflights necessary for law enforcement and national defense purposes within these zones would require consultation with the Sanctuary before the activity commences to ensure the activity is conducted in a way to minimize negative impacts to Sanctuary resources and qualities.

H. Operation of "Personal Water Craft"

1. Status Quo

a. Existing Regulatory Framework

"Personal Water Craft" means any motorized vessel which is generally less than fifteen feet in length as manufactured, is capable of exceeding a speed of fifteen knots, and has the capacity to carry not more than the operator and one other person while in operation. The term includes but is not limited to jet skis, wet bikes, surf jets, miniature speed boats, air boats and hovercraft.

Local City ordinances can regulate the operation of thrill craft on a case-by-case basis. In addition, the California Department of Boating and Waterways is responsible for boating facilities and regulation of such activities. The City of Santa Cruz prohibits the operation of personal watercraft within a Special Use Zone extending 300 yds offshore between the eastern boundary of the City of Santa Cruz and to the Pajaro River, excluding the City of Capitola and except when launching and landing.

b. Impact to Resources

The use of personal water craft can pose a serious threat to the resources of the Monterey Bay area. There is a potential for collisions with marine mammals and birds, injury to kelp beds, damage to mud flats and eelgrass and disturbance due to noise and exhaust to organisms near and on the surface in proximity to the craft.

c. Impact to Uses

Personal water craft operation interferes with the safe use of near shore ocean waters by other recreational users such as surfers, swimmers, recreational fishermen and other water sport users.

Under this alternative NOAA will monitor the activities of these "personal water craft" to determine, first, the extent of this activity and if indeed there is a threat to the resources and, second, if regulations should be promulgated prohibiting these activities in specified areas.

2. Sanctuary Alternative (Preferred)

a. Sanctuary Action

Operation of personal water craft within the Sanctuary is prohibited except in three designated zones and in designated routes to and from these zones. Generally, the three areas and access routes are:

- (1) an approximately 3 sq.nmi area off of Santa Cruz Small craft Harbor ramp from 36° 57.4' N along a 100 yd wide access route due south along 122° W to the northern boundary of Zone One (marked by the whistle buoy at 10 fathom curve) bounded by (a) 36° 55' N, 122° 02' W; (b) 36° 55' N, 121° 58' W; (c) 36° 56.5' N, 121° 58' W; and (d) 36° 56.5' N, 122° 02' W;
- (2) an approximately 5 sq.nmi area off of Moss Landing Harbor/Elkhorn Yacht Club Launch Ramp from 36° 48.5' N along a 100 yd wide access route due west along via harbor entrance to the eastern boundary of Zone Two bounded by (a) 36° 50' N, 121° 49.3' W; (b) 36° 50' N, 121° 50.8' W; (c) 36° 46.7' N, 121° 50.8' W; (d) 36° 46.7' N, 121° 49' W; (e) 36° 47.8' N, 121° 48.2' W; and (f) 36° 48.9' N, 121° 48.2' W; and
- (3) an approximately 6 sq.nmi. off of the U.S. Coast Guard Pier (Monterey Harbor) Launch Ramp from (36° 36.5' N, 121° 53.5' W) along a 100 yd wide access route due north along 122° W to the southern boundary of Zone Three bounded by (a) 36° 38.5' N, 121° 55.5' W; (b) 36° 36.9' N, 121° 52.3' W; (c) 36° 38' N, 121° 51' W; and (d) 36° 40' N, 121° 54.3' W.

b. Impact to Resources

This regulation is designed to provide enhanced resource protection by addressing a major gap in the regulatory regime governing activities in the area. Operations of personal water craft would be prohibited generally beyond the 10 fathom contour and thus include protection to all State Parks, Reserves, Ecological Reserves, Refuges, Areas of Special Biological Significance, and Elkhorn Slough National Estuarine Research Reserve. In addition, areas of high marine mammal and seabird concentrations, kelp forest areas, river mouths, estuaries, lagoons and other similar areas within the Sanctuary would be protected (Figure XX).

c. Impact to Uses

A zoned approach to the use of personal water craft will still allow this activity to continue albeit only in specified areas. These areas were designated in part to not only maximize resource protection but to minimize conflicts with other uses and provide zones and access to these zones in areas where personal water craft operation has traditionally taken place.

This regulation would also reduce conflicts, and thus potentially positively impact, other beneficial uses of the Sanctuary such as surfing, sailing, recreational fishing and diving.

Operation of personal water craft outside of these zones would be allowed if necessary to respond to an emergency threatening, life, property or the environment.

Those craft not included within the definition of "personal

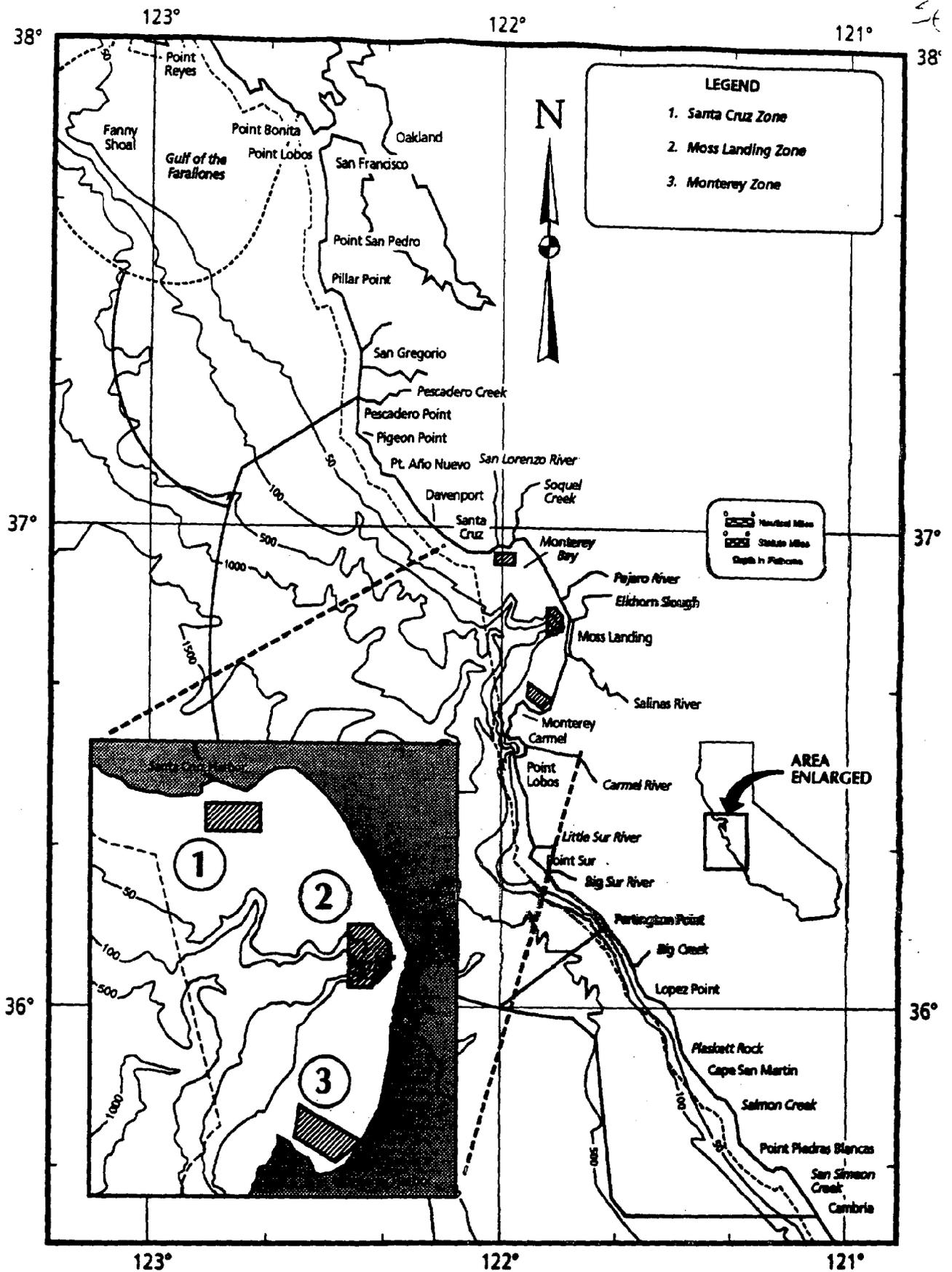


Figure 33. Areas Zoned for Operation of Thrill Craft (For precise areas see Management Plan).

water craft" would be exempt from this regulation (i.e. speed boats greater than 15 feet). However, should the need arise in the future, these exempted vessels may need to be regulated by the Sanctuary to address threats to Sanctuary resources and qualities. Such authority would fall under the scope of the Sanctuary Regulation for Vessel Traffic (see below).

I. Vessel Traffic

1. Status Quo (Preferred)

a. Existing Regulatory Framework

Oil Pollution Act, 1990 (P.L. 101-380); Act to Prevent Pollution from Ships, MARPOL Annex I-V, Ports and Waterways Safety Act, International Convention to Prevent Collisions at Sea, California Oil Spill Prevention, Abatement, and Removal Act, 1990, (SB 2040).

The primary responsible agencies are, The United States Coast Guard, International Maritime Organization, Department of Fish and Game, State Lands Commission.

b. Impact to Resources

Although the area has had a long history of safe vessel traffic there may be a threat to the resources of the Monterey Bay area from possible collisions both between vessels and between vessels and resources of the Sanctuary, disturbances by vessels of resources of the Sanctuary and possible spills of oil and hazardous materials (Figure XX).

The probability and magnitude of a spill from all sources of vessel traffic remain uncertain. The U.S. Coast Guard is currently working with the Fish and Wildlife Service on a section 7 consultation regarding possible impacts on endangered species, specifically the Southern Sea Otter, from rerouting vessel traffic off the coast of California.

Once this information is available, NOAA will work with the U.S. Coast Guard as well as other Federal, State and local agencies

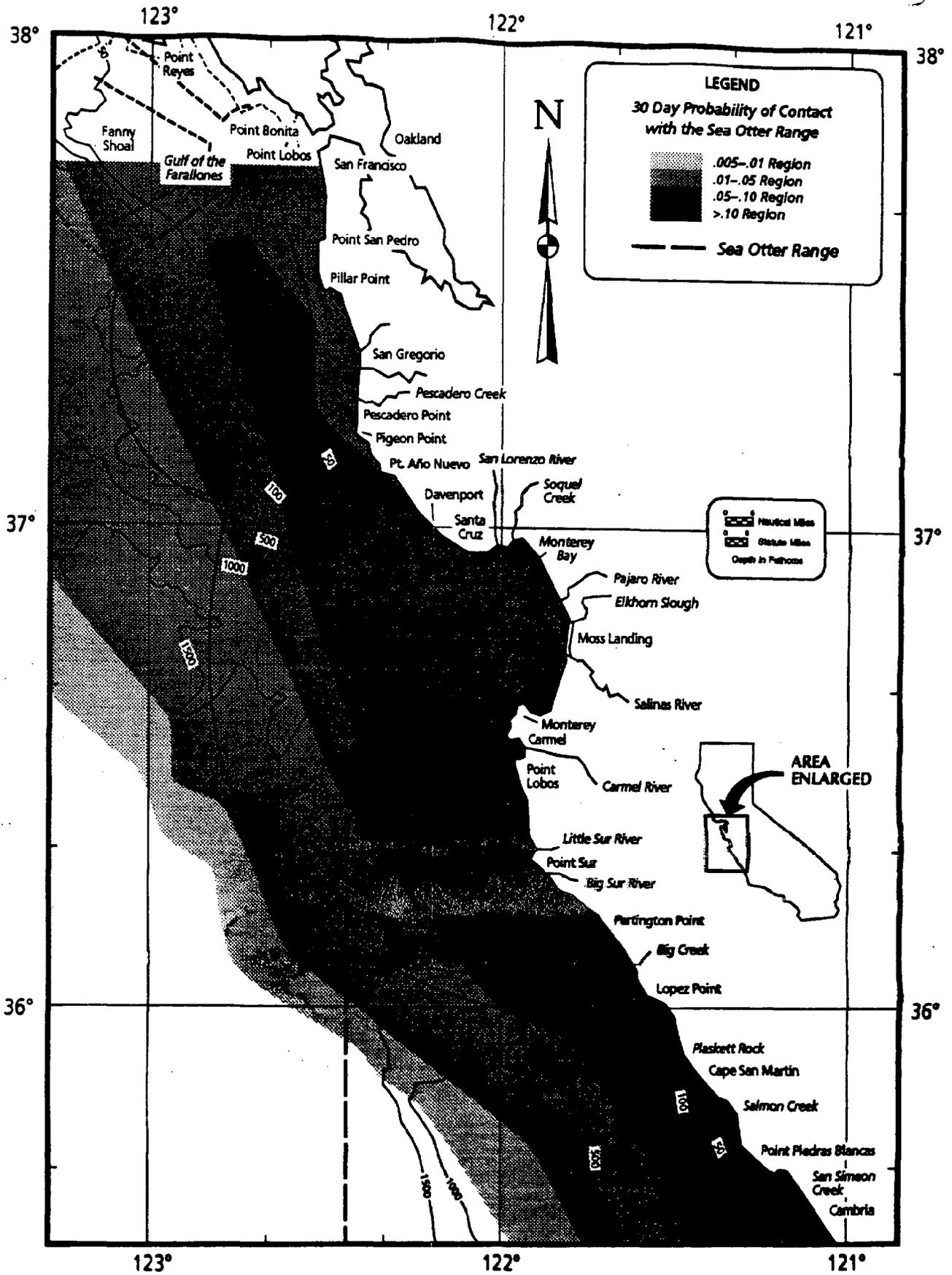


Figure 38. 30 Day Probability of an Oil Spill Contact with the Sea Otter Range - Seasonal Average
 (Source: Seasonal and annual trajectory analysis of simulated oil outflow from vessel routes)

to ensure that all the resources and qualities of the proposed Sanctuary are accounted for in the investigation and that future *plans such as those for rerouting of vessel traffic off the coast of California and other preventative measures, take into account the purposes of the Sanctuary. In addition, NOAA will maintain close communication with the U.S. Coast Guard to evaluate the need for any necessary mitigative measures such as new or improved emergency response plans and equipment or additional studies and plans such as monitoring studies.

Action deemed appropriate will be submitted to the International Maritime Organization for their approval and adoption into international law to ensure that foreign vessels are included within the scope of the regulation.

For example, under MARPOL, "Special Areas" are designated with additional protection (in comparison with other open seas) with respect to operational discharges of oil (MARPOL, Annex I), noxious liquid substances (MARPOL, Annex II) and garbage (MARPOL, Annex V). In summary, discharge requirements in Special Areas designated via the IMO are considerable stricter than discharge requirements in other open sea areas.

Also, the IMO can designate "Particularly Sensitive Areas", that meet specific ecological, social, cultural, economic, scientific and educational criteria. In some circumstances, a proposed Particularly Sensitive Area may include a buffer zone and a core area for which particular protection from shipping is sought. In addition to the protection afforded by relevant MARPOL

Annexes described above for "Special Areas", a Particularly Sensitive Area can include; (1) Areas to be Avoided (which closes an area for ships or certain classes of ships); (2) Routing measures (such as separation zones, precautionary areas, etc.,) and; (3) Vessel Traffic Services (VTS) such as reporting systems, navigation assistance and controlling of traffic.

c. Impact to Uses

The term "Commercial Vessel" includes any vessel engaged in the trade of carrying cargo, including but not limited to tankers and other bulk carriers and barges. The scope of this regulation also includes "Non-Commercial Vessels" such as, but not limited to: vessels used in seismic surveys, recreational and commercial fishing boats, kelp cutters, research vessels, recreational vessels, including but not limited to speed boats and vessels engaged in the trade of servicing offshore installations.

At present only a few, large commercial vessels visit Monterey Bay ports, mainly to dock at Moss Landing. Almost all of the commercial vessel traffic within the proposed Sanctuary passes through the western edge of the proposed boundary. The navigation aids on geographic coastal points and the deep offshore water assist to minimize the possibility of groundings.

In addition, recent Federal and State legislation (Federal Oil Pollution Act (OPA) and California State Oil Spill Prevention, Abatement, and Removal Act (SB 2040) have focused directly on improving the status quo with regards to environmental protection from commercial vessel traffic (See Appendix C). For example, OPA

establishes specific provisions for oil pollution liability, penalties and compensation as well as procedures regarding prevention of oil spills and removal of oil in case of an accident. Double hulls are required for most tankers in a phased approach over time as well as regulations regarding vessel communication equipment. In addition, California's SB 2040 emphasizes preventative measures as well as new response procedures including: expanded oil tanker inspection and safety programs, tugboat escorts in hazardous waters and comprehensive oil spill prevention plans for all tankers and terminals. SB 2040 creates a new state oil spill response unit, mandatory insurance requirements for tankers and an Emergency Fund for Clean Up.

Non-commercial vessel traffic is usually for specific purposes within the Monterey Bay area, such as research surveys in specific areas or fishing over specific fishing grounds. Such activities are regulated based on the special activity conducted rather than the transiting of the vessel through the area.

Future regulations and/or actions that could impact vessel traffic may include but are not limited to one or a combination of the following: (1) designation of Areas to be Avoided (i.e. coast-wise vessel traffic be routed outside the boundaries of the Sanctuary); (2) designation of Areas of Special Biological Significance (ASBS) (i.e. vessels are liable for high financial penalties under international law if they cause injury to resources or qualities in an ASBS); (3) designation of vessel traffic lanes, separation schemes or fairways (i.e. all "large" vessels inbound to

and outbound from Monterey Bay be restricted to port access route(s)); (4) the Monterey Bay National Marine Sanctuary be designated a "Tanker Exclusions Zone", (in accordance with OPA, Section 4111(b)(7)); (5) oil barge traffic be prohibited within the Sanctuary; (6) special technical designs be required (i.e. require double hulls, for petroleum and other hazardous substance transport vessels in the Sanctuary); (7) special planning procedures be implemented (i.e. emergency response plans be prepared or acquisition and installation of additional emergency response equipment be initiated); and (8) operational requirements (i.e. minimum number of staff on bridge and watches when entering a port in the Sanctuary).

2. Sanctuary Alternative

a. Sanctuary Action

Under this alternative, a regulation would be promulgated with designation prohibiting or otherwise regulating operation of vessel traffic. Regulation of this activity is included in the Scope of Regulations but the preferred alternative is not to regulate with designation. The preferred alternative, to give NOAA the authority to regulate vessel traffic in the future but to rely on the status quo with designation, will give NOAA the flexibility to work immediately with the U.S. Coast Guard on appropriate courses of action to protect the resources and qualities of Monterey Bay.

b. Impact to Resources

Nearshore coastal resources, within three miles of the coast,

could be protected by creating zones around specially environmentally sensitive areas such as ASBS's, rookeries, colonies, haulout areas, and estuaries and sloughs. However, offshore resources, such as cetacean, fish and seabird populations, and foraging grounds may not be adequately protected from such coastal buffers. In addition, coastal resources would still be at risk from large spills within the Sanctuary, but outside any proposed zones, that drift onto the coast with onshore currents and winds.

c. Impact to Uses

The primary user group affected would be vessel owners and operators. NOAA's regulations would impact these user groups by potentially causing vessels to travel greater distances around the Sanctuary, follow specific operation procedures not usually executed and potentially require special equipment installation.

Regulation under this alternative would have to distinguish between impacts to commercial vessels versus other types of vessels in the Monterey Bay area such as recreational (speed boats, yachts), fishing (recreational and commercial, including kelp cutters), and research (including geophysical surveys), based on the threats of the vessel type to the resources and qualities of the Monterey Bay area.

Recreational users of the area and commercial fishermen would potentially benefit from such regulations if the action were to reduce the likelihood of spills, groundings and accidents that may injure aesthetic qualities and natural resources of the Sanctuary.

However, such regulatory action would be taken unilaterally by NOAA without the advise and expertise of the U.S. Coast Guard and would not affect foreign vessel traffic transiting the area in international and territorial seas. For example, USCG current, and proposed regulations address construction standards for vessels as well as officer competency and bridge organization. Given the difficulty in regulating staffing and construction standards for vessels in discrete areas, the on-going USCG study of traffic lanes and proposed regulations, new State and Federal laws, and the speculative nature of the projected vessel traffic increase associated with OCS leasing, it seems premature to propose Marine Sanctuary regulations to deal with these issues. These problems are more effectively dealt with on a nationwide basis in cooperation with the international shipping regulatory regime.

J. Fishing

1. Status Quo (Preferred)

a. Existing Regulatory Framework

California Fish and Game Code, Fishery Management Plans, Magnuson Fishery Conservation and Management Act, 16 U.S.C. §§ 1801 et seq.

Responsible agencies include, the Pacific Fishery Management Council, National Marine Fisheries Service (NOAA), and Department of Fish and Game.

b. Impact to Resources

Fishing activities are allowed and there are no fishing regulations under § 944.5. As required by Section 304(a)(5) of Title III of the MPRSA, a Pacific Regional Fishery Management Council shall be provided with the opportunity to prepare draft regulations for fishing within the Sanctuary for amendments to include fishing regulations to § 944.5. The Secretary shall prepare fishing regulations in accordance with 15 C.F.R. § 922.31 which implements the requirements for drafting fishing regulations. Such a regulation is directed specifically at fishing activities and vessels. This does not include a regulation that is generally applicable to all types of vessels or activities, even if the general regulation affects fishing vessels and fishing activities. Such general regulations may, however, be drafted to exclude fishing activities and vessels should this be deemed appropriate.

In its evaluation of this issue, NOAA considered whether, under the present regulatory structure, sufficient protection for

Sanctuary resources existed. NOAA has determined at present, after consultation with the Fish and Wildlife Service, the National Marine Fisheries Service (NMFS), the Pacific Fisheries Management Council (PFMC) and the California Department of Fish and Game that fishing in the Sanctuary, including fishing for shellfish and invertebrates and mariculture, shall not be regulated as part of the Sanctuary management regime.

Furthermore, in its decision advising NOAA to proceed with the preparation of a Draft Environmental Impact Statement for the proposed Sanctuary, the Pacific Fisheries Management Council (PFMC) also recommended that the regulation of fishery resources remain under the jurisdiction of the State of California, the National Marine Fisheries Service (NMFS) and the PFMC.

Fishing activities are extensive in the Monterey Bay area and the productive fish stocks support an economically very valuable fishery. To ensure continued healthy stocks and minimization of adverse environmental impacts, commercial fisheries are already heavily regulated.

Fishing in Monterey Bay waters is regulated by the groundfish and salmon FMP's. In the FMP's, the Council establishes catch limits for groundfish and specifies the duration of the fishing season and catch and size limits for salmon. Commercial fishing-gear restrictions are specified for both the groundfish and salmon fisheries. The Magnuson Fishery Conservation and Management Act (MFCMA) provides for enforcement of Fishery Management Plans (FMP's) prepared by the Pacific Fishery Management Council and

approved by the Secretary of Commerce after review by the National Marine Fisheries Service.

In addition, the CDF&G enforces State regulations for fishing activities (See Appendix C). Recent State initiatives, relevant to certain parts of the Monterey Bay area, include prohibition on the use of drift and set gill nets targeted to specific areas for: (1) taking rockfish and lingcod in less than 40 fathoms (SB 2564); (2) gill and trammel in less than 30 fathoms, and with net size restrictions (AB 2563); (3) prohibitions on the use of gill and trammel nets in ocean waters less than 40 fathoms (SB 40) and 60 fathoms (SB 1462), 30 fathoms (SB 2563); (4) taking of rockfish and lingcod in gill nets in waters less than 100 fathoms or 75 fathoms (depending on area, SB 2122); (5) Proposition 132 (Marine Resources Protection Act) among other issues prohibits the use of gill and trammel nets to take rockfish off of California (whether this applies in Federal waters has yet to be determined by the PCFMC); and (6) prohibits the use of drift gill nets to take shark and swordfish in waters less than 12 nautical miles from the mainland shore. (AB 2915) (Figure XX).

In general fishing activity is extensively regulated to not only ensure continuous production of fish stocks for long-term harvest (Table XX) but also to reduce potential conflict with marine mammals and seabirds.

The gill net fishery has been regulated since 1984 by the State and Federal governments because of the mortality of seabirds and sea otters that became entangled in the nets. Approximately 6

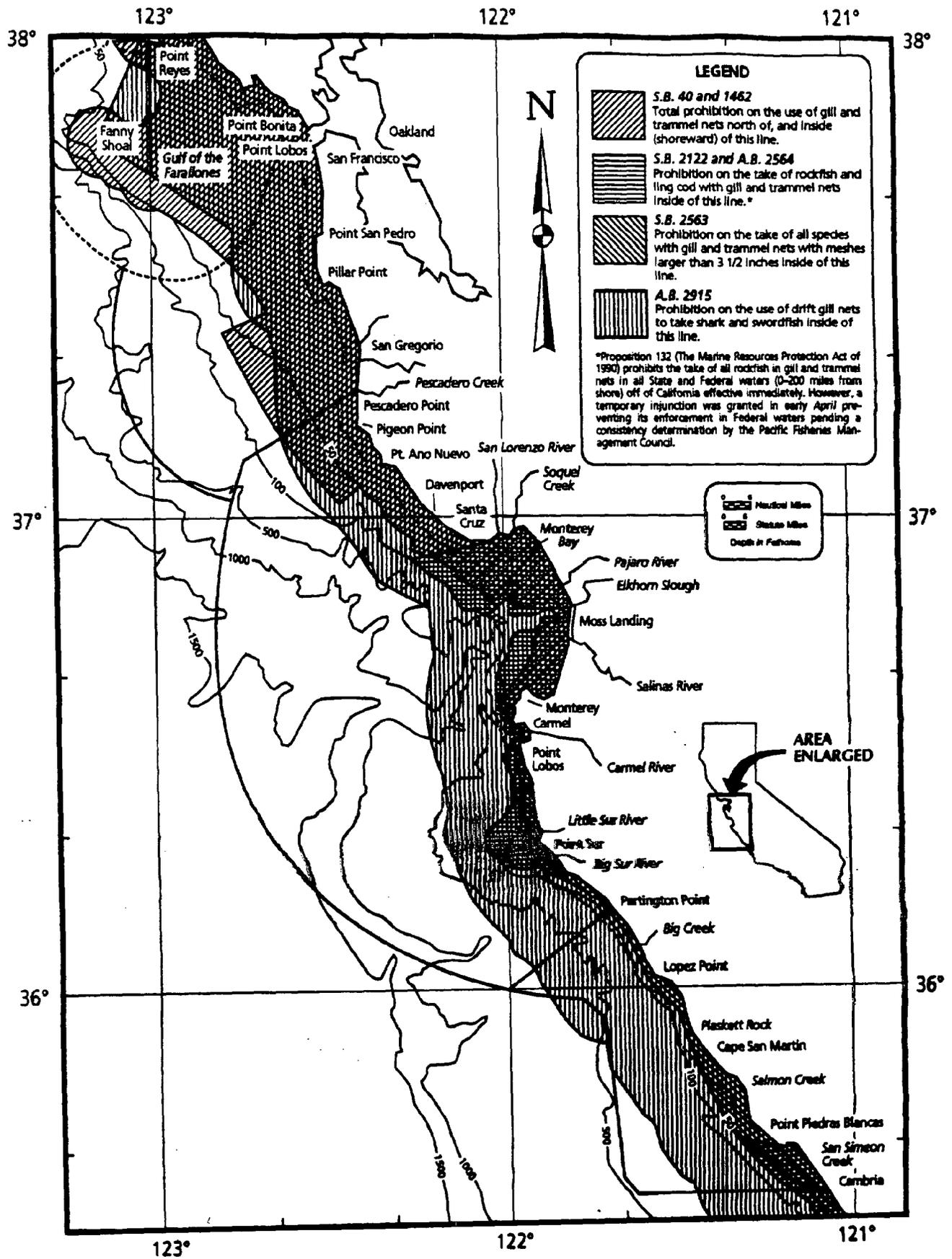


Figure 34. Recent State Restrictions on Commercial Fishing.

2
Table 48.

23
Catch restrictions for species of commercial fish in the Monterey Bay Area (References are to the California Fish and Game Code).

Sardines Catch limited to 20,000 tons statewide or as adjusted by the Department proportional to increase in spawning population (§8150.7)

Anchovies Restricted according to the Pacific Fishery Management Council (PFMC) Plan.

Lobster Fishery open between the first Wednesday in October and the first Wednesday after March 15 (§8251). Lobster permit required (§8254.7). Size restrictions exist (§8252).

Salmon Restricted according to PFMC Plan.

Crab Fishery open between the second Tuesday in November and June 30th (§8276).

Abalone Unlawful to take for commercial purposes except south of line extending due west from Yankee Point where the depth exceeds 20 ft.

Clams Fishery open year round except in an area between lines extending due west from Pigeon Point and Yankee Point where open between September 1st and April 30th.

Scallops Unlawful to sell or purchase.

Saltwater/
Anadromous Striped bass illegal to possess unless releasing from net (§8320); kelp bass, sand bass, and spotted bass may not be sold (§8372); yellow fin and bluefin tuna must exceed 7 1/2 lbs. to be marketed (§8375); albacore and skipjack may be taken at any time (§8376 and 8378); white sea bass, barracuda, and yellowtail not less than 28 inches in length may be taken by hook and line at any time.

Mackerel Catch limited until stock is enhanced (§8388.3)

California
Halibut May be taken at any time (§8391) (certain area restrictions apply - see text).

Rockfish Numerous restrictions apply (see text for details).

to 15 boats participate in this fishery off Monterey Bay (pers. comm., Marine Resources Division, Monterey Bay area, CDF&G, March 1990). This method of fishing is now restricted to waters deeper than 20 fathoms. In April 1989 the halibut gill net fishing was closed inside 40 fathoms due to the incidental capture of over 40 harbor porpoises (Edward Melvin, pers. comm., 1989). The current regulations on this fishery prevent gill-netters from fishing within 30 fathoms and would effectively move the current gill-net inshore fishery beyond the zone of distribution of shore birds and coastal marine mammals.

The 1988 Amendments to the Marine Mammal Protection Act established an exemption for commercial fishermen to take marine mammals incidental to their fishing activities. The taking of sea otters was specifically excluded from the 5-year interim incidental take exemption for commercial fishing operations and no incidental takes are authorized. The amendments require the National Marine Fisheries Service, with NOAA, to establish an exemption, observer, and reporting system to document incidental captures of marine mammals by fishermen that are expected to take marine mammals. Based on reports of the fishermen, the NMFS is to submit to Congress its recommendations to manage commercial fishing activities in a way that reduces adverse impacts to marine mammals.

The NMFS has registered fishermen in fisheries known to capture marine mammals, including the following fisheries operating in the vicinity of the proposed Monterey Bay NMS:

-- Gillnet fisheries for thresher shark, angel shark, swordfish, halibut, white sea bass, yellow tail, soupfin shark, white

croaker, and bonito/flying fish, and

- Purse seine fisheries for herring, anchovy, mackerel, tuna, sardines, and squid.

Fishermen began reporting incidental captures to NMFS under these amendments on July 1, 1989. Results so far for Category I boats, including all large mesh (6" or greater) halibut nets, indicate that, for the 24 sets observed in the Monterey Bay area (out of 622 total for all of California) from July, 1990 to end of December, 1990, 6 harbor seals, 15 California sea lions and 3 northern elephant seals, were killed (NMFS, pers. Comm. April, 1991). Data on seabird mortality from this reporting system is collected by the CDF&G.

The trawler fishery has also been extensively regulated and no trawlers are currently allowed within 3 miles of the coast (pers. comm., Marine Resources Division, Monterey Bay area, CDF&G, March 1990). Approximately 8 boats participate in this fishery using a mixture of otter trawls and roller trawls. No data exists on amount of incidental take of birds and marine mammals from the trawler fishery beyond three miles. It is unlikely that trawling will cause incidental take of marine mammals and seabirds as the gear is only deployed over short periods of time and covers small areas of the ocean floor. Also, this type of activity occurs outside of three miles which is beyond the range of most of the nearshore diving birds and sea otters. Finally, during an experimental period of 5 years, two trawlers were permitted to fish within three miles and during this experimental period there was no incidental take of marine mammals or seabirds (pers. comm., Marine

Resources Division, Monterey Bay area, CDF&G, March 1990).

There is almost no data regarding the effects of roller trawling, or the one to two boat trap-fishery, to resources near and on the bottom such as benthic organisms and habitats (Edward Melvin, pers. comm., March, 1990). However, preliminary estimates from the few boats that roller trawl and trap would indicate very minimal impact (pers. comm., Marine Resources Division, Monterey Bay area, CDF&G, March 1990).

The California Department of Fish and Game has management responsibility for the development of mari- and aquaculture under Section 1700(f) of the California Fish and Game Code. The by-catch of Nereocystis leutkeana is restricted to 5% of the entire load. The reproductive part of the plant is located on the surface and harvest is limited. California Department of Fish and Game manages kelp harvesting and designates specific areas for use. Almost all of the harvesting takes place within a four to five mile area near Point Sur. Currently no studies exist regarding the effects of harvesting this species.

c. Impact to Uses

Fishing in the Sanctuary may be regulated other than under the Act by Federal and State authorities of competent jurisdiction, and designation of the Sanctuary shall have no effect on any regulation, permit, or license issued thereunder, e.g., regulations promulgated under the California Fish and Game Code and regulations implementing Fishery Management Plans promulgated under the Magnuson Fishery Conservation and Management Act, 16 U.S.C. §§ 1801

et seq.

However, the status quo would also include four proposed Sanctuary regulations that could potentially indirectly affect fishing activities. Therefore to be consistent with the intent to not regulate normal fishing activities with designation, each regulation of concern specifically exempts normal fishing activities from the scope of these regulations to the extent consistent with existing other State and Federal regulations.

The four regulations of concern are: (1) discharges and deposits. Under this regulation fishing vessels may be regulated except for specific discharges intended to exempt normal fishing activities; (2) moving, possessing, or injuring or attempting to move, possess, or injure a Sanctuary historical resource is prohibited, except for accidental moving, possession or injury during normal fishing operations; (3) drilling through, dredging or otherwise altering the seabed of the Sanctuary or constructing, placing or abandoning any structure or material on the seabed of the Sanctuary is prohibited except for normal fishing operations ie. traps and bottom trawls; and (4) taking of marine mammals and seabirds may be regulated except in accordance with and permitted by regulations promulgated under the Marine Mammal Protection Act (MMPA) and the Endangered Species Act (ESA).

Thus each regulation potentially affecting normal fishing activities is specifically designed to exempt fishing activities from the affect of the regulation.

Kelp harvesting activities would also be unaffected by the

regulatory regime. NOAA will work with the CDF&G and help harvesting industries if new activities are proposed or increases in current levels to determine the impacts, if any, of the activity on the resources and qualities of the Monterey Bay area.

At the present time there are many existing regulations and restrictions on fishing activities in the Monterey Bay area that are designed to protect the long-term health of the fisheries as well as other resources and qualities of the Monterey Bay area. Therefore NOAA does not believe it necessary to promulgate any additional regulations with designation.

2. Sanctuary Alternative

a. Sanctuary Action

Fishing regulations are included in the scope of regulations. Consistent with the provisions of the MPRSA (Section 305(a)(5)) the Sanctuary shall first provide the Pacific Fisheries Regional Management Council (PFMC) with the opportunity to prepare draft regulations for fisheries within the Sanctuary should the need arise to protect Sanctuary resources and qualities from specific fishing activities. In the future the Sanctuary would work with the fishermen and the local management agencies as well as California Department of Fish and Game and the PFMC to determine any additional management measures that may be necessary to protect the resources and qualities of the Monterey Bay area. Such actions would be submitted in draft for public review and comment on any specific measures taken to address threats from fishing to Sanctuary resources and qualities.

The Sanctuary shall only prepare fishing regulations if: (1) the PFMC fails to make a determination with respect to the need for fishing regulations; (2) the Secretary of Commerce determines that the PFMC's draft regulations fail to fulfill the purposes of Title III of the MPRSA and goals and objectives of the proposed designation; and (3) the PFMC fails to prepare draft regulations in a timely manner.

b. Impact to Resources

Actions promulgated under this authority would be targeted at protecting specific resources, qualities and habitats shown to be injured by fishing activities. Such injury could include but is not limited to destruction of benthic habitat from bottom trawling, incidental take of marine mammals and seabirds from gill-nets, and evidence of a reduction in fish stock size.

c. Impact to Uses

Under this alternative NOAA would work with the affected fishing entities to determine the level of impact to their activities. Actions would be taken to minimize negative consequences and burdens while at the same time addressing the threat to Sanctuary resources and qualities.

III. Section: Management Alternatives

A. Introduction

Three management alternatives were identified and considered in terms of (1) resource protection, research, and education requirements, and (2) cost-effectiveness. The Management Plan (Part V) includes a detailed discussion of the proposed Sanctuary management regime regarding resource protection, research, education and administration.

B. Alternatives

1. Status Quo

Under this alternative protection and management of the proposed Sanctuary area would remain entirely under the existing regime of federal, state and local authorities, and existing research and education facilities and programs with no NOAA presence.

2. Sanctuary Management Alternative 1

Under this alternative, NOAA would establish an independent management and administrative system for the Monterey Bay National Marine Sanctuary in a headquarters that is managed and operated directly by NOAA. The location of the Headquarters would be in the Monterey Bay region at either Santa Cruz, Moss Landing or Monterey.

This alternative would gradually phase in a variety of program activities and focus initially on research and education. Staffing would start with a NOAA manager and phase in an assistant manager, administrative assistant, research coordinator, education coordinator and a joint position of an interpreter/enforcement

official.

The office would coordinate directly and actively with other state and local agencies in decision making and implementation of Sanctuary regulations. The Sanctuary Manager and the Advisory Committee would begin the process of informing the public as well as regional officials of the Sanctuary's mandate, regulations and research and education programs.

3. Sanctuary Management Alternative 2 (Preferred)

The preferred alternative is to set up the Sanctuary headquarters soon after designation (within six months) and immediately provide full-staffing in the positions described for Sanctuary Management Alternative 1. In addition, the preferred option is to provide "satellite" information centers as well as the main headquarters facility so that other areas of the Sanctuary are represented.

CONSEQUENCES

Environmental Consequences Of Alternatives

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PART IV: ENVIRONMENTAL CONSEQUENCES OF ALTERNATIVES

In selecting the appropriate, boundary, regulatory and management alternatives for the proposed Monterey Bay National Marine Sanctuary, NOAA evaluated the environmental consequences of their implementation. This section discusses the consequences of the status quo as well as Sanctuary alternatives including those resulting from the preferred alternative. The consequences of the proposed action are discussed in the context of the predicted impacts to the affected activities and existing jurisdictions, if any, for the affected activity and, the predicted impact to the resources and qualities of the proposed Sanctuary.

I. Section: Boundary Alternatives

A. Introduction

The seven boundary alternatives analyzed would protect resources and qualities of the Monterey Bay ecosystem to varying degrees of areal extent. Each boundary alternative is explained on the basis of distribution of encompassed resources, qualities and human uses. Tables XX and XX summarize in comparative form the percent of resources and uses encompassed by each boundary alternative relative to the entire study area (also boundary #5). The environmental consequences of each boundary alternative are discussed in the context of the preferred resource protection and management regime.

Those alternatives that excluded critical components of the ecosystem were not considered as they would not have met the intent and purpose of the MPRSA to protect special areas of the marine environment on an ecosystem basis and to provide a coordinated and comprehensive approach to their conservation and management.

B. Boundary Alternative 1

Boundary alternative #1 is based both on depth and distance from shore and is designed to encompass the nearshore coastal resources. The emphasis of this alternative would be on land-sea interactions and immediate coastal processes rather than the offshore marine environment.

Active tectonic and sedimentary processes are incorporated within this boundary alternative, but does not represent all of

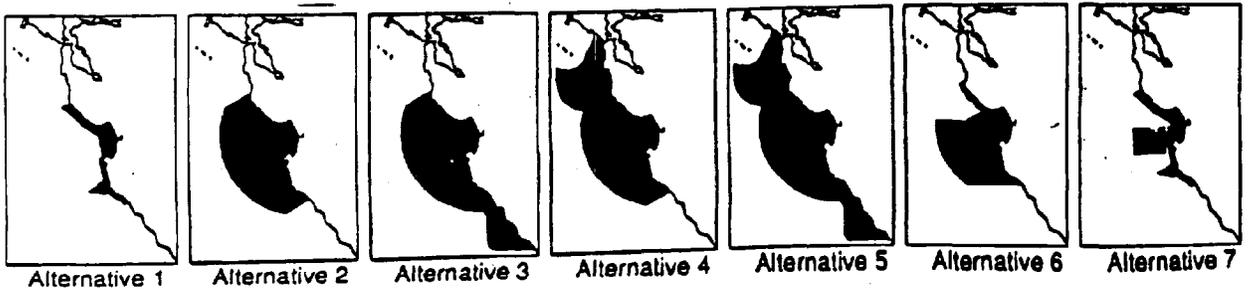
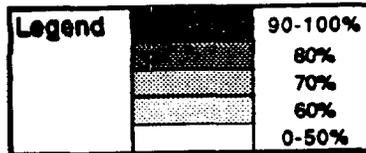
TABLE XX. ENVIRONMENTAL CONSEQUENCES OF BOUNDARY ALTERNATIVES

(A) PERCENT RESOURCES ENCOMPASSED

RESOURCE CATEGORY % Distribution	BOUNDARY ALTERNATIVES							UNIT
	1	2	3	4	5	6	7	
Protected Areas	80	50	50			50	80	All Sites
Invertebrates	70	70	80			70	70	High Conc'n Areas
Rockfish	10	50	70	70		50	20	Spawning Habitat
Squid	40	40	50			30	40	Spawning Habitat
Seabirds	20	40	50	50		30	20	High Conc'n Areas
Fissipeds	60	60		50		60	60	# of Individuals
Pinnipeds	20	40	50	50		40	20	High Conc'n Areas
Cetaceans	20	60	50	70		50	30	High Conc'n Areas
Canyon Habitat	10	50				60	40	Sq. nautical miles
Kelp Habitat	50	50		50		50	50	Sq. nautical miles
Wetland Habitat								Sq. nautical miles
Historical	40	40	40			40	40	Shipwrecks

(B) PERCENT USES ENCOMPASSED

USE CATEGORY % Distribution	BOUNDARY ALTERNATIVES							UNIT
	1	2	3	4	5	6	7	
Comm. Fishing	70	70	70			70	70	Total Fish Value
Military	0	50	50			60	10	Sq.mi. Train'g Areas
Vessel Traffic	30	40	40			40	40	# Vessels/ Year
Recreation	70	70	70			70	70	#Adj. Ocean Areas
Urban Land Use								Square Miles
OCS Oil	20	30	30			20	20	Million Barrels
OCS Gas	20	30	30			0	20	Billion Cubic Feet
Discharges (PS)	50	50	50			50	50	BGY W/water in Ocean
Discharges (NPS)	70	70				70	70	BGY W/water
Resh/Edn								# of Facilities



these processes. The western boundary includes the Palo Colorado-San Gregorio fault zone, the major tectonic boundary of the Salinian block; structure and stratigraphy are considerably different on either side of the line. The boundary incorporates mainly the Monterey, Soquel and Carmel Canyons that principally cut the shelf. Also, parts of the three sedimentary cells (Año Nuevo-Northern Monterey, Southern Monterey, and Sur Cells) are included. It would only provide a minimal buffer to the natural resources of Año Nuevo and the Big Sur coastline. The heads of the Carmel and Monterey Canyons would be included but the deep sea environments of the Canyon complexes would be excluded as would the areas above these canyons that are important as feeding grounds for sea birds and marine mammals.

The ground water basins for the Monterey Bay region are also found within the boundary and all of the water quality studies associated with issues resulting from point-source and non-point source discharges can be addressed. However, offshore eddy, current, "jet", upwelling and pollutant dispersion patterns will not be incorporated within the boundary and thus receive less emphasis from Sanctuary initiated research studies and resource management initiatives.

This alternative is designed to encompass all of the resources in the immediate vicinity of the coastline (described in Part II, Section II). The boundary includes the entire range of fish and invertebrates found in the study area but excludes much of the feeding area over the Monterey Canyon for seabirds. The area would

include the best areas for sighting cetaceans from shore (off Point Lobos, Año Nuevo and Davenport) and includes the important cetacean and seabird feeding areas along the canyon edge.

However this alternative does not provide sufficient habitat protection to migrating and foraging mammals and Seabirds above the Canyon in the open ocean. The northern boundary would not include the northern limit of the sea otter range nor the fishery resources off Pigeon Point. Also the nearness of the western boundary to the coast would not provide the nearshore resources of Año Nuevo, Big Sur and the kelp beds an effective buffer zone from potentially harmful offshore activities.

The boundaries encompass the areas with the longest history of research; the intertidal zone in Monterey Peninsula and around Point Lobos. Interpretation of the entire range of habitat and community types typical of central and northern California would be possible. Monterey Bay, and its adjacent coastline would be the focus of the Sanctuary, and of the interpretation program. The program could focus on the various coastal environments and upon the fishery and fisheries management issues. Offshore fisheries, such as the trawlers and gill netters would be excluded and not available for study or inclusion in Sanctuary management programs to protect offshore marine resources. All marine oriented recreational opportunities (surfing, diving, sport fishing, boating, beachcombing, nature viewing) would be well represented, except for any offshore whale watching trips.

This alternative would preclude all State offshore oil and gas

drilling but have almost no impact on proposed Federal OCS Lease Sales as the boundary approximately follows the three-mile limit. Also, offshore vessel traffic would pass beyond the western edge of the proposed boundary and thus be subject only to the prohibition regarding extraterritorial discharges, not to the prohibition regarding discharges within the Sanctuary. The limited extent of the geographical buffer from this boundary alternative leaves the resources and qualities of Monterey Bay quite vulnerable to routine vessel traffic and oil and gas activities such as waste and discharge disposal as well as more catastrophic events such as well blowouts or tanker collisions.

The Sanctuary could address the sources of point-source and non-point source pollution that may affect nearshore Sanctuary resources and qualities but would be limited in its ability to manage the effects of these waste disposal activities on offshore resources.

C. Boundary Alternative 2

Proposed boundary alternative #2, the preferred alternative, will integrate many important coastal, nearshore, and deep ocean canyon resource zones into one management regime. These zones include Monterey Bay, the Big Sur coastal area, Año Nuevo, the adjacent continental shelf, slope, and rise as well as certain highly productive shoreline and intertidal areas, such as Pescadero Marsh and Elkhorn Slough, and the deep ocean environments of the Ascension, Monterey Bay, Big Sur and Partington Canyon complexes

and a portion of the abyssal plain off Monterey.

The coastline boundary is contiguous with 32 units of the California State Park System and Beach System and Ecological Reserves. These units include the Point Lobos State Reserve, Hopkins Marine Life Refuge, Pacific Grove Marine Gardens Fish Refuge, Carmel Bay Ecological Reserve and the Julia Pfeiffer Burns Underwater Park with protection extending to subtidal marine habitats. Also, five Areas of Special Biological Significance (ASBS), established by the State of California, would be included in this alternative. In addition, all major research/education institutions in the region are encompassed within the boundary.

The boundary includes Año Nuevo, the most important rookery and resting area for pinniped species in central and northern California, including the largest breeding population of Stellar sea-lions south of Alaska, as well as many colonies of sea birds. The northern boundary would also encompass the official northern range of the Southern sea otter, extending to Pigeon Point.

Pescadero Marsh and Creek are important nesting areas for the snowy plover, a species of special concern in California. One fifth of the State's breeding population of snowy plovers are found in the Monterey Bay region. Pescadero Marsh is the largest coastal wetland between San Francisco Bay and the Elkhorn Slough. Also, the northern boundary is designed to encompass valuable commercial fishing grounds including a portion of the dover sole fishery between 400 and 1400 m and the nearshore trammel net and trawl fishery for halibut. Pigeon Point is also the site of the greatest

sport and commercial salmon fishing within this boundary alternative early in the season.

The oil and gas resources to the north of the preferred boundary alternative #2 would still be available for leasing. In all areas of the Central California Planning Area NOAA will work closely with MMS to determine any additional technological safeguards that may be necessary to protect the resources and qualities of the Sanctuary from any potential environmental injury. This boundary alternative provides a buffer zone for Sanctuary resources and qualities from oil and gas activities, enabling physical and chemical weathering of any potential oil spills before contact with the coast of Monterey Bay, and a greater response time to deploy booms and oil-spill clean-up equipment in areas of predicted high vulnerability.

Offshore vessel traffic would pass within the western edge of the proposed boundary. Thus vessel traffic within the Sanctuary would be subject to the Sanctuary prohibitions on discharges and deposits within the Sanctuary. However, the resources and qualities of the Monterey Bay area would still be vulnerable to catastrophic events such as vessel collisions or groundings and subsequent spill of oil or hazardous materials. The extent of the potential injury would depend on the season and corresponding current pattern, location and size of the spill.

The western boundary is constrained primarily from depth and geomorphic parameters. The boundary coincides with the termination of the Monterey Canyon on the ocean's abyssal plain at the Paleo

Subduction Zone. Within this boundary the very active tectonic (fault rupture, earthquakes, landslides) and sedimentary processes (turbidity flows, landslides, littoral drift) of the Monterey Bay region take place. Three major sedimentary cells (Año Nuevo-Northern Monterey Bay, Southern Monterey Bay, and Sur cells) are present, terminated by Monterey, Carmel and Sur Canyons respectively. The entire Monterey Canyon system consisting of Ascension, Soquel, Monterey, and Carmel Canyons are included as well as the Fan-Valleys of Monterey Canyon.

The western boundary will encompass the deep ocean floor where recently cold-seeps were discovered that nourish abyssal, biological communities (EEZ News, October, 1989). These deep-sea communities have only recently been discovered and investigated and usually only in association with deep-sea hydrothermal vents. Many birds and mammals are found feeding in the deep waters over the Monterey Canyon. Many of these species are endangered or threatened and almost the entire population of ashy storm-petrels feed during summer and fall within the 1000 fathom (2000 m) isobath which is encompassed by the central and northern portions of the proposed boundary.

The southern boundary is drawn to encompass a shallow sublittoral habitat west of Point Sur. This Sur platform is heavily fished with different gear types for rockfish, dover sole, swordfish and thresher sharks. It is also a well known area to divers for its abundant and varied populations of benthic invertebrates. A recent benthic survey of the area discovered an

extraordinary, diverse and abundant benthic community on this rocky platform (Cordell Expeditions, 1990). The preferred boundary encompasses a major portion of the Sur Canyon and the Partington Canyon complexes and is contiguous with the southern boundary of the Julia Pfeiffer Burns Underwater Park and ASBS.

This southern area contains a pristine environment that is relatively uncontaminated when compared with more developed areas such as San Francisco Bay. The high water quality of this southern area provides the Sanctuary research program with an opportunity to contrast pollutant studies between developed versus undeveloped land/sea interfaces.

Throughout the entire area the oceanic circulation is highly variable. Many complex current patterns exist within the preferred boundary. For example, the Dungeness crab species is not produced locally, rather it is advected into local waters by prevailing currents (W. Graham, preliminary data, unpublished Master's Thesis, U.C. Santa Cruz). The influencing current during the relevant months (April-July) is the southerly flowing California Current. The Dungeness crab fishery is the most important commercial crab fishery on the West Coast. However the fishery has been greatly reduced due to a number of possible causes including overfishing in northern Monterey Bay (Dahlstrom and Wild, 1983), changes in ocean currents, increase in parasites that destroy the crab's eggs, and a decrease in water quality from adjacent land uses, leaving a small fishery in the Moss Landing area. To re-establish a fishery for the Santa Cruz region the larvae need to recruit to local waters

from north of Monterey Bay and produce an adult population that will approach self-maintaining.

Wind-driven, coastal upwelling occurs north and south of Monterey Bay and upwelled waters from these areas may be advected into the Bay. These nutrient rich waters play a vital role in sustaining the high productivity of the Monterey Bay ecosystem. One locus of upwelling is the coastline south of Monterey, where currents and "jets" occur and may concentrate plankton, food for fishes, birds and mammals. These areas are encompassed by the proposed boundary and provide an opportunity to plan research studies to investigate these oceanographic mechanisms.

Consideration of the physical oceanographic dynamics is important to protect the Sanctuary resources from possible contaminants transportable by currents and eddies. Coastal currents can transport dissolved or suspended materials at the rate of 10-20 miles/day. The oil spilled by the Puerto Rican in October/November 1984 traveled 20 miles overnight.

Research shows many instances of coastal waters being carried into the Bay from offshore. Main coastal current direction varies seasonally, so transport can come from either north or south. The preferred alternative boundaries to the north and south will create a buffer zone for many of the most sensitive Sanctuary resources and provide the Sanctuary Manager adequate response time to prepare contingency plans for pollutants travelling along the coast. The western boundary lies seaward of important coastal eddies and "jets" that enter Monterey Bay.

In addition to unifying the rich habitat areas listed above in one management and planning area, the proposed Sanctuary, through regulations, would create a buffer area between potentially harmful activities outside the proposed Sanctuary and especially sensitive habitat areas within. In short, the marine ecosystem's diverse resource endowment and rich productivity make it an area of regional and national significance. The area deserves long-term protection and enhancement to complement the protection already provided for some of its resources onshore and for sections of the nearshore zone along the northern Monterey Bay coastline, Monterey Bay itself, and the Big Sur coastline to the south. Overall, this alternative is focused on Monterey Bay and enables coordination of research and education facilities in the area as well as facilitates cooperation with State and local management authorities directly involved with the Bay.

D. Boundary Alternative 3

Boundary alternative #3 is a variation of alternative #2 with a southern extension. All of the resources, uses and management considerations described above for boundary #2 would be incorporated. This discussion only references those additional resources, uses and management considerations incorporated with a southern extension.

The southern boundary is designed to coincide with the southern boundary of the California Sea Otter Refuge and encompass the undeveloped and protected coastline along the Los Padres

National Forest. This would provide an opportunity to integrate management and research plans on land and sea interactions across relatively pristine representatives of the two environments. In addition to the resources and features encompassed by the preferred alternative, this southern extension encompasses additional concentrations of bird, fish and mammal habitat, and particularly offshore concentrations of marine mammals.

Around Big Creek, Lopez Point and Grimes Point are unusually dense and diverse populations of encrusting invertebrates, including the hydrocoral, Allopora californica. Large areas of Giant Kelp and Bull Kelp are found along this southern coastline. Lopez Point is an important breeding and nesting area for large colonies of Pelagic and Brandts Cormorants, Western Gulls and Pigeon Guillemots. Around Lopez Point are large concentrations of squid and a rich area for the salmon fishery. An ASBS is located around the mouth of Salmon Creek. Large concentrations of harbor seals use the beaches north of Plaskett Rock as a haulout site. Cape San Martin is important as a haulout area for California sea lions and is also a mainland breeding site for the northern elephant seal. This boundary would also encompass two additional research centers, namely the U.C. Landels-Hill Big Creek Natural Reserve and the U.S. FWS Field Research Station at Point Piedras Blancas. Finally, this southern extension would provide more protection to the California sea otter by encompassing the entire range of the Official California Sea Otter Refuge.

Although this third alternative would provide additional

protection to the resources and pristine habitats to the south as well as encompassing the entire sea otter refuge, these resources seem adequately protected by existing management authorities and not under any immediate or long-term threat from harmful human activities, in this southern area.

This boundary alternative is also prohibitive due to its large size and the associated problems with management logistics. Enforcement activities would be too diffuse throughout the Sanctuary to protect the resources adequately. The area does not seem to need any additional layer of protection as it is relatively undisturbed by human activities and largely inaccessible to visitors. No additional discharges are known to be in this area but it would include a greater area of the OCS Central California Planning Area and preclude any future Lease Sales in this area.

Finally the preferred alternative, Boundary Alternative #2, encompasses similar types of resources and habitats that are included in this southern extension of boundary Alternative #2.

E. Boundary Alternative 4

Boundary alternative #4 is presented in response to public comments during the scoping meetings and is justified on the basis of providing a continuous management regime between the Gulf of the Farallones National Marine Sanctuary and the proposed Monterey Bay National Marine Sanctuary. This alternative is a variation of alternative #2 with a northern extension. All of the resources, uses and management considerations described above for boundary #2

would be incorporated. This discussion only references those additional resources, uses and management considerations incorporated with a northern extension.

A continuous Sanctuary would ensure that the resources of the Monterey Bay area would not be vulnerable to any discharges between the Gulf of the Farallones NMS and the proposed Monterey Bay NMS and migratory species would be better protected within a continuous Central California Marine Sanctuary. This northern extension encompasses additional fish, seabird and marine mammal habitat particularly offshore concentrations of seabirds.

This alternative would also encompass the coastal resources of the San Mateo Coast including the James V. Fitzgerald Marine Reserve Area and ASBS as well as the fishery resources and industry in Half Moon Bay and Princeton Harbor. Finally, the recreational and public interpretation facilities of the Golden Gate National Recreation Area could be incorporated into the educational program of the Sanctuary as well as large numbers of historical and cultural sites particularly shipwrecks off of the Golden Gate.

Although this fourth alternative would provide a jurisdictional link between the Gulf of the Farallones and Monterey Bay NMSs, it does not encompass additional special marine resources to warrant Sanctuary protection.

The offshore area is used heavily by vessels entering and exiting San Francisco and the Corps of Engineers for dumping and dredging activities. Additional areas within this northern area are also being considered for future disposal of dredge material

and potentially, highly productive oil and gas reserves would be encompassed. Extensive military activity occurs in this area especially during submarine training operations. Finally, this area is heavily impacted by both point source and non-point source pollution, primarily from the urbanized areas of northern coastal San Mateo County and San Francisco County.

Overall this northern extension is not included as part of the Monterey Bay National Marine Sanctuary regime due to: (1) the lack of any additional, special concentrations of resources and qualities, (2) a minimal increase in the public benefit derived from the extension, (3) a potentially large negative impact to present and potential users of the area and, (4) the increase in size of the Sanctuary would decrease its manageability and increase costs required for adequate enforcement, surveillance, education and research.

F. Boundary Alternative 5

Boundary alternative #5, the study area, includes all of the resources uses and management considerations discussed above for boundary #2 as well as both the extensions south and north described for alternatives #3 and #4 respectively.

This alternative represents a total combination of all the different public comments and resource information gathered during the scoping process, preparation of the DEIS/MP and public hearings. Only a couple of commenters suggested that the alternatives include an even larger boundary extending from the

State of Alaska to the Mexican border and out to 200 miles. This suggestion was determined to be beyond the scope of reasonable analysis for the draft environmental impact statement/management plan for the proposed Monterey Bay National Marine Sanctuary and therefore was not considered further.

Alternative 5, as well as 3 and 4, all suffer the major disadvantage of extending the boundary beyond the biological, geological and physical oceanographic resources of the Monterey Bay area. In addition, the disadvantages associated with boundaries # 3 and #4 would still apply including the: 1) adequacy of the existing management regimes (particularly to the south), 2) the few public benefits to be derived and potentially large negative impacts (particularly to the north), 3) the lack of additional resources and qualities needing protection and the unwieldiness of the extensions from a management perspective and 4) the cost from operational considerations.

G. Boundary Alternative 6

Boundary alternative #6 is based on excluding areas offered by no canceled Lease Sale 119 for development of hydrocarbon resources. The exclusion of all of Lease Sale 119 from the proposed boundary would make available any oil, gas or mineral resources in the southern portion of the ex-Lease Sale area (Figure XX). This area has geological characteristics that may have resulted in the generation and accumulation of commercial volumes of hydrocarbons (Mullins and Nagel, 1982). Economically

recoverable hydrocarbon resources could possibly exist and, under this alternative, therefore be available for development by the oil and gas industry.

NOAA would coordinate with MMS during all phases of the OCS development planning process, including prior to the exploration plan approval, to determine any additional technological safeguards or environmental monitoring that may be necessary to help protect Sanctuary resources and qualities.

Oil and gas offshore operational technology has advanced considerably since the 1960's (Baker, 1985) and the experiences from past blowouts and spills have served as the catalyst for the present day relatively strong Federal OCS oil and gas regulatory regime. Department of the Interior, MMS, final rule for oil and gas and sulphur operations in the OCS, (30 CFR Parts 250 and 256) provides the regulatory regime for more performance standards and new and updated requirements for operational and environmental safety. The use of Best Available and Safest Technologies is required by the Director of MMS to help prevent significant effects on safety, health or the environment (30 CFR Part 250.22). Numerous regulations exist to help prevent blowouts during the different phases of oil and gas activities and which require adequately trained personnel during OCS operations.

However, it is NOAA's mandate under the MPRSA to identify special areas of the marine environment of special National significance due to their resource or human-use values and provide authority for comprehensive and coordinated conservation and

management of these marine areas. Since Monterey Bay was considered for National Marine Sanctuary status in December 1979, NOAA has appraised the physical, geological, chemical and biological resources of the Monterey Bay area as part of an entire ecosystem. The distinct and complex bathymetry, current patterns and ocean structure induce upwelling of productive nutrient-rich waters that, in turn, are directly responsible for the abundant and diverse biological resources that are distributed from as far north as Año Nuevo and Pigeon Point to south of the Big Sur coastline. The combination of this ecosystem's resources and human uses in the proposed Monterey Bay National Marine Sanctuary meet all of the criteria set by NOAA for meeting the standards of the MPRSA.

Although it is clear that the natural resources and qualities of Monterey Bay are of National significance, scientific evidence and public opinion are still divided regarding the effects of oil and gas activities on these natural resources despite the available technology and operational regulations used in developing the OCS.

In general, boundary alternative #6 would not only exclude the majority of biological resources that are part of the Monterey Bay area ecosystem but leave the Monterey Bay area vulnerable to oil spills, blowouts, noise and visual disturbances and pollution from aquatic discharges. Specifically:

- (a) There would be no buffer for Año Nuevo or fishing grounds in two canyons to the north of Monterey Bay,
- (b) Scenic beauty north of Monterey Bay would be substantially altered,

(c) The threat of oil spills (50% probability of 0.69 estimated mean number of spills of greater than 1000 barrels from activities directly associated with oil and gas activities in the central California OCS Planning area) and the discharges (estimated 302,000 barrels of muds and cuttings and 225 million barrels of formation waters), despite MMS controls, would certainly affect Sanctuary resources and qualities due to south flowing current and minimal amount of time for chemical and physical weathering processes.

Due to the mandate of the MPRSA to protect Nationally significant natural resources and qualities from an ecosystem perspective and the reality of the threat to these resources in the Monterey Bay area, NOAA is proposing to eliminate concern for any adverse environmental impacts that may occur in the Sanctuary from oil and gas activities by prohibiting these activities within the proposed Sanctuary boundary (Alternative #2).

H. Boundary Alternative 7

Boundary alternative #7 is also based on excluding areas offered by ex-Lease Sale 119 for development of hydrocarbon resources. Like boundary alternative #6 this scenario would exclude all of ex-Lease Sale 119 as well as additional areas adjacent to ex-Lease Sale 119 and all the area south of Monterey Canyon exclusive of state waters. This alternative makes the economically recoverable hydrocarbon resources that possibly exist in these areas potentially available for future development.

This boundary alternative encompasses the same coastal uses, resources and qualities described for boundary alternative #1 and in addition focuses on encompassing the main features of the Monterey Canyon at depths below 500 fathoms.

The same drawbacks advanced for boundary alternative #6 regarding both offshore technology and NOAA's statutory authority under the MPRSA apply to boundary alternative #7. This boundary alternative would leave the Monterey Bay area vulnerable to oil spills, blowouts, noise and visual disturbances, and pollution from aquatic discharges.

Specifically, there would be no buffer for Año Nuevo or fishing grounds in the canyons to the north of Monterey Bay, there would be no buffer for Point Sur or fishing grounds in Partington Canyon to the south of Monterey Bay and significant portions of primary commercial fishing areas notably Rockfish longline fisheries, trawling zones off Santa Cruz, and similar longline fisheries off Point Lobos would be excluded.

Significant seaward extensions of Ascension and Partington submarine canyons would be excluded, as would significant areas of habitat for migrating and foraging animals above and below Monterey Canyon. In addition, important areas of upwelling, oceanic currents, eddies and jets north and south of Monterey Canyon would be excluded.

The scenic beauty north and south of Monterey Bay would be substantially altered and the threat of oil spills and drilling discharges would be extended to exceptionally pristine ocean

environments south of Monterey Canyon.

II. Section: Regulatory Alternatives

A. Introduction

This section analyses the environmental consequences of the nine activities included within the scope of the Sanctuary regulations. For each activity there is an analysis of the impact of a specific Sanctuary regulatory alternative compared with the status quo alternative, to natural resources and to human uses, including identification of the preferred Sanctuary action.

Table XX, summarizes the overall environmental consequences of all regulations for each of the seven proposed Sanctuary boundaries. This comparative analysis is based in part on: (1) a quantitative understanding of the resources and uses encompassed within each boundary (see Tables XX and XX) and; (2) a qualitative assessment of the predicted impact to the human uses and resources and qualities within each boundary from all Sanctuary regulations considered together (i.e. cumulative impact) as well as under the status quo.

Overall, the proposed regulations and designation are intended to: (1) improve resource protection by instituting new regulatory measures and by supplementing present surveillance and enforcement actions; (2) minimize negative impacts to human uses, particularly to those deemed consistent with the purposes of the Sanctuary and; (3) provide for a manageable area including such factors as its size, its ability to be defined as a discrete ecological unit, its accessibility, and its suitability for monitoring and enforcement activities.

Table . ENVIRONMENTAL CONSEQUENCES OF REGULATIONS
BY SANCTUARY BOUNDARY

25

(A) Predicted Cumulative Impact to Selected Resources Under Status Quo

Resource Category	Boundary Alternatives							UNIT
	1	2	3	4	5	6	7	
Protected Areas	○	○	○	□	□	○	○	All Sites
Invertebrates	□	□	□	▨	▨	□	□	High Conc'n Areas
Rockfish		□	□	□	□	□		Spawning Habitat
Squid		□	□	□	□		□	Spawning Habitat
Seabirds		□	□	▨	▨			High Conc'n Areas
Fissipeds	□	□	○	□	□	□	□	# of Individuals
Pinnipeds		□	□	□	□			High Conc'n Areas
Cetaceans		□	□	□	□			High Conc'n Areas
Canyon Habitat								Sq. Nautical Miles
Kelp Habitat	□	□	□	□	□	□	□	Sq. Nautical Miles
Wetland Habitat	□	□	□	▨	▨	□	□	Sq. Nautical Miles
Historical	○	○	○	○	○	○	○	# of Shipwrecks

(B) Predicted Cumulative Impact to Selected Users Under Status Quo

Use Category	Boundary Alternatives							UNIT
	1	2	3	4	5	6	7	
Comm. Fishing	□	□	□	▨	▨	□	□	Total Fish Value
Military	□	□	□	□	□	□	□	Sq. N. Mi. Training Area
Vessel Traffic	○	○	○	◐	◑	○	○	Vessels/Year
Recreation	○	○	○	◐	◑	○	○	# Ocean Adjacent Areas
Urban Land Use	○	○	○	◐	◑	○	○	Square Miles
OCS Oil	○	◐	◑	●	●	○	○	Million Barrels
OCS Gas	○	◐	◑	●	●	○	○	Billion Cubic Feet
Discharge (PS)	◐	◑	◒	●	●	◐	◑	BGY Wastewater to Ocean
Discharge (NPS)	○	○	○	◐	◑	○	○	BGY Wastewater
Research/Educ'n	○	○	○	○	○	○	○	# of Facilities

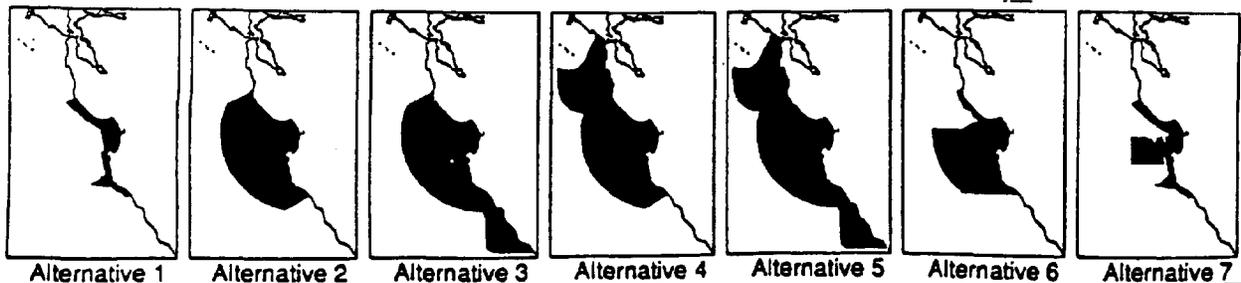
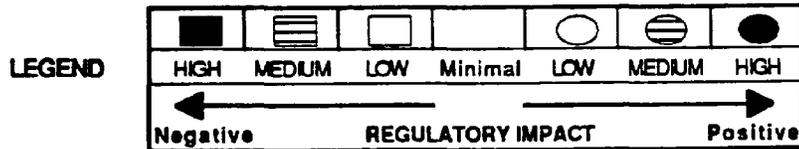


Table . Continued.

(C) Predicted Cumulative Impact to Selected Resources from Sanctuary Regulations

RESOURCE CATEGORY	BOUNDARY ALTERNATIVES							UNIT
	1	2	3	4	5	6	7	
Protected Areas	○	◐	◑	◒	◓	○	○	All Sites
Invertebrates	○	○	○	○	○	○	○	High Conc'n Areas
Rockfish		○	○	○	○	○		Spawning Habitat
Squid	○	○	○	○	○	○	○	Spawning Habitat
Seabirds		◐	◑	●	◓			High Conc'n Areas
Fissipeds	○	◐	●	◓	●	○	○	# of Individuals
Pinnipeds		◐	◑	◒	◓			High Conc'n Areas
Cetaceans		◐	◑	◒	◓			High Conc'n Areas
Canyon Habitat		○	○	○	○	○	○	Sq. Nautical Miles
Kelp Habitat	○	○	◐	○	◓	○	○	Sq. Nautical Miles
Wetland Habitat	●	●	●	●	●	●	●	Sq. Nautical Miles
Historical	◐	◑	◒	●	●	◓	◔	# of Shipwrecks

(D) Predicted Cumulative Impact to Selected Users from Sanctuary Regulations

Use Category	Boundary Alternatives							UNIT
	1	2	3	4	5	6	7	
Comm. Fishing	○	○	○	○	○	○	○	Total Fish Value
Military		□	□	□	□	□		Sq. N. Mi. Training Area
Vessel Traffic		□	□	▨	▨	□	□	Vessels/Year
Recreation	◐	◑	◒	◓	◔	◕	◖	# Ocean Adjacent Areas
Urban Land Use	□	□	□	□	□	□	□	Square Miles
OCS Oil	□	□	□	■	■	□	□	Million Barrels
OCS Gas	□	□	□	■	■	□	□	Billion Cubic Feet
Discharges (PS)	▨	▨	▨	■	■	▨	▨	BGY Wastewater to Ocean
Discharges (NPS)	□	□	□	▨	▨	□	□	BGY Wastewater
Research/Educ'n	◐	◑	◒	◓	◔	◕	◖	# of Facilities

Abbreviations Conc'n = Concentration, Sq. = Square, Sq.N.Mi. = Square Nautical Miles, PS= Point Source, NPS = Non-Point Source, Educ'n = Education, BGY = Billion Gallons Year.

It is important to note that as NOAA promulgates these regulations the Agency must work within the constraints of Title III of the MPRSA. Specifically, section 304(c) provides that NOAA cannot terminate valid leases, permits, licenses or rights of subsistence use or of access existing as of the date of Sanctuary designation but can regulate the exercise of such authorizations and rights consistent with the purposes for which the Sanctuary was designated.

B. Oil, Gas and Mineral Activities

1. Status Quo

a. Consequence of Impact to Resources

Part of the rationale for including boundary alternatives that would permit neighboring oil and gas activities is based on the assumption that the status quo regulatory and administrative offshore oil and gas regime is adequate in preventing significant adverse impacts of oil and gas activities on the environment. Oil and gas offshore operational technology has advanced considerably since the 1960's (Baker, 1985) and the experiences from past blowouts and spills have served as the catalyst for the present day relatively strong Federal OCS oil and gas regulatory regime.

However, it is still possible that adverse environmental impacts may occur within the Sanctuary as a result of oil spills, synergistic effects of various discharges from oil and gas activities associated with nearness to a drilling site, or sublethal effects from low-level exposure to these wastes discharged from oil and gas activities.

Offshore hydrocarbon exploration, development and production activities, including the transshipment of oil to the mainland, may cause unforeseen and potentially substantial discharges of oil (chronic and catastrophic discharges) into the marine environment in a number of ways. Sanctuary uses, resources and qualities are at risk from the adverse impacts of: (1) well blowouts caused by equipment failure or damage and geologic hazards, (2) oil spills and pipeline leaks, (3) noise and visual disturbances caused by

drilling, the presence of drill rigs or platform, work crews, supply boats, and helicopters, (4) pollution associated with aquatic discharges, and (5) short-term pipeline construction upheaval.

Table 13 summarizes the known threats to marine resources and qualities which result from offshore oil and gas activities. Estimates of the magnitudes of these threats (where possible) is given below.

According to MMS (1987) the estimated mean number (Est. Mean #) and probability (Prob.) of each source of spill, using a Poisson distribution, is as follows:

<u>-Spills from OCS Sources</u> <u>in Central California</u>	<u>Est. Mean #</u>	<u>Prob.</u>
- Platforms	0.30	
- Pipelines	0.00	
- Tankers	0.39	
<u>SUBTOTAL</u>	<u>0.69</u>	<u>0.5</u>
<u>-Spills From Other Sources in Central California</u>		
- Current 5-Year Plan OCS Transport	0.36	0.3
- Other Domestic Transport	1.51	0.78
- Imported Transport	1.42	0.76
<u>TOTAL SPILLS: ALL SOURCES</u>	<u>3.98</u>	<u>0.98</u>

If during exploration, oil companies discover major hydrocarbon resources, then an unknown amount of additional sales with associated development could occur with a corresponding increase in the probability of an oil spill. Likewise, the reverse may be true if less hydrocarbon resources are discovered than

Table 10. Summary of Threats to marine mammals, seabirds, and marine organisms resulting from offshore oil resources development and production (modified from University of California, Santa Cruz, 1976.)

<u>Activity/Facility</u>	<u>Chronic Hazard</u>	<u>Episodic/Catastrophic Events</u>
<u>Exploration</u>		
Seismic Profiling Drilling	Noise, "startle effect"	Sub-surface noise, Concussion Siltation, Turbidity increase
Boat Traffic	Sub-surface noise and propeller hits	
<u>Operation</u>		
<u>Offshore facilities</u>		
Platforms	Intrusion	
Well head	Leakage/seepage	Blow-out
<u>Support</u>		
Supply boats	Sub-surface noise and propeller hits	
Aircraft	Noise in the air	
<u>Transport</u>		
Pipelines	Leakage	Rupture
Pumping buoys	Leakage	
Barges/Tankers	Bilge oil intrusion	Collision or grounding
<u>Clean-up</u>		
<u>Oil on water</u>		
Skimmers	Intrusion	
Burn-off		Pollution--air
Chemicals	Toxicity of Chemical	Pollution--water
<u>Grounded oil</u>		
Dispersants	Disturbance to sensitive bird and mammal populations on beaches and haul-out	Pollution--sediments
Booms		Habitat destruction
Straw		
Chemicals		
Presence of crew areas and equipment		

estimated.

In addition to oil spills a wide variety of pollutant discharges are normally associated with OCS oil and gas development: drill cutting and muds, sewage and trash, formation waters, marine corrosion products, and air pollutants (e.g. petroleum aerosol and exhausts).

Hazards to living resources from oil development operations can result from the on-site discharge of drill cuttings and drilling muds which may adversely affect benthic biota as well as fishery resources, seabirds and marine mammals. An estimated 302,000 barrels of muds and cuttings and 225 million barrels of formation waters would be discharged during the lifetime of potential OCS development off central California (MMS, 1987).

In 1983, the Marine Board of the National Research Council conducted a study of drilling discharges. The study found that these discharges present minimal risk to the marine environment. The Marine Board did note, however, that drilling discharges do have an impact on the immediate benthic environment (National Research Council - Marine Board, 1983). However, more recent research (EPA, 1985) has shown significant benthic impacts from platform discharges up to two miles from drilling sites.

Air pollution discharges normally associated with hydrocarbon activities disperse rapidly into the atmosphere or ocean waters, and thus pose relatively minor threats to Sanctuary resources.

Oil and gas platforms, rig, and related activities produce both a visual intrusion on the scenic qualities of the area's

seascape and disturbances due to construction activities and to the sound and movement of boats and helicopters (U. S. Bureau of Land Management, 1979). The continuous human activity associated with oil and gas development and the steady stream of crew and supply boats produce visual impacts and noise which may disturb marine birds and marine mammals, particularly during sensitive nesting, pupping and migration seasons. If these disturbances occur very close to shore stampeding by pinnipeds or sudden flights by nesting birds can occur (U.S. Bureau of Land Management, 1979).

During critical breeding periods such reactions could result in increased mortality rates in young marine birds and marine mammals (U.S. Bureau of Land Management, 1979). A higher general level of human intrusion feasibly could discourage pinnipeds such as the Stellar Sealions from ever fully recovering at their breeding areas on Año Nuevo, although the likelihood of this occurring has not been scientifically substantiated.

b. Consequence of Impact to Uses

Oil and gas industry development in the area would potentially increase with the production of oil and gas for the Nation's energy needs. The necessary infrastructure for such development would involve coastal development and urbanization to provide support facilities for the offshore platforms. Such an increase in use may also have the indirect affect of displacing traditional uses such as fishing over areas used by the platforms and sightseeing that would be interrupted by the aesthetic disturbance of the platforms.

2. Sanctuary Alternative 2 (Preferred)

a. Consequence of Impact to Resources

By excluding hydrocarbon activities from the Sanctuary, the proposed regulation establishes a "time and space" buffer area between oil and gas activities and particularly sensitive island and nearshore habitat areas. Table 14 describes how NOAA's proposed Sanctuary provisions will help mitigate the impacts of offshore oil and gas activities.

Although there are stipulations on oil and gas leases imposed by MMS in environmentally sensitive areas, and MMS regulations (30 CFR Part 250) address many safety and environmental concerns, considering the known vulnerability of the marine flora and fauna to oil spillage and the difficulty of containing oil spills in the open ocean, a prohibition of oil and gas development is necessary to achieve formal acknowledgment, and more coordinated long-term stewardship, of the region's significant offshore resources.

The proposed development of the OCS to the north of Monterey Bay poses concern due to the southward flowing current for much of the year, and the close juxtaposition of the breeding and resting habitat at Año Nuevo. The predominantly northward flow in coastal areas south of Point Sur may also move the spilled oil into the Sanctuary from future exploration in the Santa Maria Basin.

The proposed prohibition on oil, gas and mineral activities in the Sanctuary establishes this area as a buffer within the Sanctuary between possible oil spills occurring outside the Sanctuary as a result of any future proposed lease sales in the

Table 11. Potential oil and gas development impacts mitigated by NOAA's preferred Sanctuary alternative.

REGULATION

PROTECTION PROVIDED

1. No future hydrocarbon exploration or exploitation within the designated Sanctuary.

- Creates a broader buffer area against potential oil spill threats and provides increased response time for cleanup efforts in case spills occur.
- Increases distances between potential spill/pollutant discharge point (i.e. rigs, platforms and pipelines) sensitive and resources which allows natural weathering and dilution of contaminants bereaching important marine life concentration areas
- Excludes noise and visual disturbances of routine operations from the vicinity of important marine life habitats.
- Reduces potential visual intrusion on aesthetic values of the 32 Units of State Park, Beach, Reserves and Refuges and the proposed Sanctuary itself.
- Reduces potential air pollution.

Central California Planning Area and the highly sensitive Año Nuevo island and mainland coastal and intertidal habitats.

These habitats range from protected marsh areas to unprotected coastal rocks, and are vital to the rich bird, fish, marine mammal, and intertidal populations in the area (see Part II). The existence of a buffer zone within the Sanctuary ensures that in the event of an oil spill, the oil would have to undergo a minimum amount of weathering before reaching more sensitive nearshore and intertidal areas. The weathering process would allow the more toxic fractions of the petroleum to evaporate and would permit some natural dispersion to occur. Also, San Francisco Bay-based contingency crews would have more time to reach the spill site and deploy containment and/or diversion equipment either at sea or around entrances to highly vulnerable Bays and sloughs.

The proposed regulation's prohibition of hydrocarbon activities throughout the Sanctuary will prevent certain discharges of contaminants due to routine rig and platform operations, which would occur if the tracts were leased and developed. The exclusion of oil and gas activities will eliminate concern for any adverse environmental impacts that may occur within the Sanctuary as a result of synergistic effects of various discharges, nearness to a drilling site, or sublethal effects from low-level exposure to these wastes discharged. While discharges outside the boundary may reach the proposed Sanctuary, their impacts will be minimized by dispersion and dilution. Further, discharges or deposits from beyond the boundaries of the Sanctuary that subsequently enter the

Sanctuary and injure a Sanctuary resource or quality are prohibited if it may reasonably be expected at the time of such discharge or deposit that the materials or other substances discharged or deposited will enter the Sanctuary and injure a Sanctuary resource or quality (See below under Discharges).

Prohibition of hydrocarbon activities will enhance the offshore area's aesthetic wilderness qualities as well as those of the adjacent mainland coastal region due to the benefit of reducing discharge of pollutants to the atmosphere. Examples of this enhancement are the indirect benefits accruing to the Point Reyes National Seashore (a Class I area under the Clean Air Act) and the Golden Gate National Recreation Area. The prohibition of oil and gas activities within the Sanctuary pursuant to future leases would reduce the potentially adverse aesthetic impacts from oil and gas platforms, rigs, pipeline construction, and other activities, and serve to preserve the wilderness character of the Island waters. While the significance of undisturbed views and wilderness is difficult to quantify in monetary terms, their protection is nonetheless important, particularly in proximity to heavily populated urban areas such as the San Francisco Bay metropolitan region and given the international fame of the Route 1 scenic drive along the Monterey Bay and Big Sur coastline. The area has never been exposed to offshore oil and gas development and no platforms have ever been visible from the shore.

b. Consequence of Impact to Uses

NOAA's proposed prohibition of future oil and gas exploration

and development within the Sanctuary boundaries would lessen the noise and human activity in coastal and offshore waters. It would also decrease the need for additional supply boats to enter the nearshore waters and overflights of helicopters that incidentally approach nesting or resting marine mammals or marine birds.

Given the wealth of sensitive renewable, natural resources within the proposed Sanctuary, the high tourism and commercial fishery value of the area, and the present indications of low National oil and gas resource potential, it is NOAA's judgment that the net economic effect resulting from a restriction on hydrocarbon operations is likely to be positive.

The net economic effect of the proposed regulation depends largely on: the amount of hydrocarbon reserves foregone, dollar value of the oil, the estimated value of the renewable resources, and the economic value of the tourist industry.

It is thought that the proposed regulation will have positive economic effects in the long-run by contributing to the preservation and health of renewable sources of income, such as fishing and recreation, due to the long-term protection to such activities from potential oil spills, discharges and visual and acoustical disturbance. In addition, the Sanctuary research and education programs will have long-term benefits by enabling natural resource managers to make better informed decisions regarding the preservation, enhancement and possible additional economic benefits of the area's natural resources and uses.

This regulation will however, eliminate any use of the area by

the oil and gas industry.

MMS estimates that the high case conditional mean estimate of the undiscovered, economically recoverable oil resources for the entire Central California Planning area is 530 million barrels and 930 billion cubic feet of gas (Cooke and Dellagiardino, in press). The FEIS for the proposed 5-Year OCS Oil and Gas Leasing Program Mid-1987 to Mid-1992 (MMS, 1987) states that one sale in the Central California planning area will produce approximately 153 million barrels of oil and 286 billion cubic feet of gas. It is estimated (Personal Communication, MMS, July, 1991) that the portion of the Central California Planning Area included in the preferred Sanctuary boundary has a conditional resource potential of 110 million barrels of oil and 150 billion cubic feet of gas with an estimated net economic value of 280 to 370 million dollars, as of 1989.

It is possible that the proposed prohibition would reduce U.S. Treasury income from offshore leasing royalties and that the industry bids on tracts affected by the prohibition would be lost in future lease sales. The total amount of lost revenue estimated by MMS from these conditional resource estimates may be modified by the results of petroleum development pursuant to actual results from drilling associated with some future Lease Sale, as well as an analysis of economic feasibility and environmental and regulatory constraints. Economic feasibility is determined solely by the oil industry based on lease sale costs at the time of sale, current oil prices, proposed project costs, and environmental reviews and

mitigation costs. Oil development costs and expected returns per investment are considered confidential information by the oil industry. Once again, environmental and regulatory constraints are impossible to identify due to the lack of experience of the Central California Planning Area with offshore oil and gas development.

At the current rate of U.S. oil consumption (17.5 million barrels/day, API, Personal communication, 1989) the projected resources of the oil within the proposed boundary amounts to less than seven days worth of energy. One should bear in mind the fact that on the California OCS, the average oil and gas production over the past 21 years was only 33.1 million barrels of oil and 32.8 billion cubic feet of gas per each of the producing fields (Personal Communication, MMS, March, 1990). In addition, it is estimated that only 6 percent of all OCS resources (discovered and undiscovered) are in fields containing more than 3 days of supply of oil for the Nation and over 80 percent of all OCS sources to be discovered are in fields containing 1 day's or less supply of oil (Personal Communication, MMS, March, 1990).

All of the above estimates are based on conditional estimates of resources and no estimates of reserve quantities can be determined until drilling occurs. As a result one cannot compare one estimate to another as each is derived from conditional probabilities. Projections on quantity and quality of oil reserves may be modified, based on the findings resulting from exploration in the Central California Planning Area and other factors which may make recovery more or less economically feasible, such as increases

or decreases in the price of imported oil or prohibitive costs of or environmental restrictions on alternative energy sources. Thus, reliable estimates of the amount and value of hydrocarbon resources affected in the Central California OCS are not available. The proposed regulation would also affect the availability of oil and gas resources and State income from the leasing of tracts located in State waters. Data on the quantity of State oil and gas OCS resources in the central California area are not available. Currently, however, there is a State moratorium on such leasing.

Finally, oil and gas resources to the north of the proposed Sanctuary, that are part of future Lease Sales within the Central California Planning Area, would still be available.

C. Discharges or Deposits

1. Status Quo

a. Consequence of Impact to Resources

The consequences of the status quo impacts to resources and qualities results in a combination of the discharges and deposits that form the background or ambient water quality in the Monterey Bay area. The overall result of the status quo is that with increasing human uses in the ocean and adjacent watersheds discharges and deposits into the proposed Sanctuary can be predicted to increase thus further threatening the resources and qualities of the area, particularly in the coastal zone, and human uses such as fishing and recreation that depend upon high water quality.

(1) Discharges from Point Sources

The CWA furnishes some protection to marine resources from the harmful effects of effluent discharges, however, it provides for a maximum penalty of only \$10,000 for a single discharge incident without the initiation of a civil action. This does not provide a sufficient deterrent for protecting important Sanctuary resources; \$50,000 is the maximum penalty allowed per day under the MPRSA. Moreover, under the status quo, there would probably be no specialized effort by the USCG to enforce the CWA in the Monterey Bay area as distinct from other offshore waters.

Several Bay communities now discharge waste (partially treated) directly into ocean waters, portions of which are designated as State Areas of Special Biological Significance

(ASBS). The City of Watsonville has received for a waiver of secondary treatment requirements of the Clean Water Act (Section 301(h)). The City of Santa Cruz currently discharges sewage which has received advance primary treatment. Santa Cruz has entered into a consent decree with the California Water Quality Control Board stating that it will meet secondary treatment requirements by 1995.

Such ocean outfalls, particularly those discharging partially treated matter into Monterey Bay, must be assessed to determine the magnitude of their threat to sensitive marine resources. Much of this research still needs to be done while an opportunity also exists to use already collected data and apply it to the management problems. Existing state and Federal regulatory and management arrangements appear to be striving toward alleviating harmful waste outfall loads over the long term in the interests of marine environmental protection. To date, implementation obstacles have hindered the attainment of regional waste treatment facilities sufficient to render ocean discharges environmentally safe. For example, a number of discrete areas along the coast of the Bay area are known to have high levels of specific contaminants. Local land point-source (eg. municipal and industrial dischargers) and non-point source discharges (eg. urban runoff and agricultural practices, much of which is upstream within the watersheds draining into Monterey Bay) are believed to be the cause of many of the pollutants. Questions remain as to not only the exact nature of the source and corresponding appropriate management measures but

also the exact nature of the environmental consequences of the discharges and any potential health threats to humans and the environment.

One of the ecological consequences of desalination operations is that marine organisms with broad salinity tolerances are expected to predominate in the immediate vicinity of the discharge plume. In addition, certain trace elements, depending on the pH and oceanographic conditions will concentrate in the surface layer above the plume and prove to be toxic to plankton, fish eggs and larvae. There is also the possibility that concentrations of these chemicals could be wind or current driven into the intertidal zone, causing problems for other organisms.

The intake of water from the ocean for desalination plants will result in impingement and entrainment of marine species. The intake and discharge may also affect marine resources by altering shoreline currents and increasing turbidity, causing sedimentation and consequent smothering of biota, or lowering light levels with consequent impacts to kelp.

The high salt concentrations of the discharge and its fluctuations may kill organisms near the outfall that can not tolerate high salinity or fluctuations beyond its range. Discharges would be more dense than seawater and could sink to the bottom causing adverse impacts to benthic communities.

Mixing the brine discharge with sewage discharge may cause the sewage contaminants to aggregate in particles of different sizes that they would otherwise. Smaller particles would interfere with

light penetration and reduce primary productivity and larger particles could be attractive to marine organisms and bioaccumulate through the food chain.

It can also be assumed that increasing population demands on the Monterey Bay coast will further degrade water quality in the future. The continued decline in wetland and slough habitat, beach closures for recreational users, decline in fish catches and the closure of shellfishing beds all indicate impacts to resources and qualities of the ocean environment indicative of a decline in water quality from many different sources. There is no single agency that reviews the discharges from an ecosystem or habitat perspective.

(2) Discharges from Non-Point Sources (NPS)

Actual field and laboratory analyses done by the State on water quality monitoring, reports for the Monterey Bay drainage area, "values in mollusk tissues for pesticides and other toxicant --- suggest that the continuing release from soil to runoff of various insecticides and other agricultural by-products remains a potential threat to the aquatic and marine habitats of the Monterey Bay area". (Cal. State Mussel Watch data from 86-87, Water Quality Monitoring Report No. 88-3, Division of Water Quality/SWRCB, July 1988.)

It is possible that pollutants also enter the ocean surface of Monterey Bay from the air but magnitudes and effects of this source are completely unknown. The California Air Resources Board monitors ambient air quality as well as EPA and the Department of

the Interior for Federal OCS activities.

(3) Hazardous waste, oil and trash disposal

There is an unknown amount of pollutants and garbage that enter the Monterey Bay area from the ocean. These discharges and deposits may have been transported far distances by ocean currents or may have come from passing vessels. In addition to reducing overall water quality and lessening the aesthetic appeal of the area, the discharge of litter may harm marine mammals that sometimes ingest or become entangled in such litter (Cava, 1989, personal communication). Pinnipeds entangled in plastic packing material or discarded fishing lines have occasionally been seen near the Farallon Islands and Channel Islands (F. Cava, 1989, personal communication). In areas of the northern Pacific Ocean as many as 8,000 fur seals become entangled in such debris annually (Haley, 1978). The incidence of the mortality associated with this type of mammal disturbance remains unclear.

Consistent with the provisions of the Marine Plastic Pollution Research and Control Act (MPPRCA) of 1987 that amends the Act to Prevent Pollution from Ships which implements Annex V of the International Convention for the Prevention of Pollution from Ships (MARPOL), this Sanctuary regulation would prohibit the disposal of litter and other solid wastes, such as fishing lines and non-biodegradable plastic or metal objects and thus protect marine animals and seabirds in the Sanctuary from ingesting these wastes while foraging, or becoming entangled in them, possibly leading to illness or death. In addition, the international agreement (Annex

V, MARPOL) regulating garbage disposal from ships and other watercraft is now part of the amendments to the Act to Prevent Pollution from Ships (APPS). An opportunity exists to help attain the goals of the APPS through the Sanctuary regulations prohibiting discharges and deposits.

Discharges from fishing vessels during normal fishing operations such as cooling waters from boat engines and fish wastes are unlikely to harm the resources of the study area. Discharges resulting from military activities in the area, such as smoke markers, sonobuoys and ordnance are slight and do not appear to pose a threat to the resources and qualities of the proposed Sanctuary. In addition, DOD vessels are directed to be equipped with oil-water separators and that the water effluent from these devices be limited to 20 parts per million (PPM) oil within 12 nmi from land or 100 PPM beyond 12 nmi from land. The oil portion is retained on board, for shore disposal.

(4) Ocean dumping

Ocean dumping, municipal outfalls, and dredged material disposal can smother benthic biota and introduce substances into the marine environment, which may affect fish, bird, and mammal resources. However, the regulations under Title I of the MPRSA prohibit ocean disposal of dredged material which proves to be toxic to the organisms of the disposal site.

A study on the release of dredged material over a 100 fathom contour site near the Farallon Islands found a relatively abundant but not diverse benthic macrofauna. The study concluded that most

of the dumped material went straight down and covered the bottom at an average depth of about 1 foot (0.3 m). Depending on use levels of such a disposal site, smothering and oxygen depletion could significantly harm the benthic community in the area (COE, 1975). However, in the case of Monterey Canyon the continuous natural disturbance at the Canyon head (the location of the existing disposal sites in the proposed Sanctuary) causes a naturally resilient benthic population (COE, 1977). Community resilience is correspondingly lower in the more complex and stable communities of deeper water (COE, 1977). The environmental complexities of sediment, water and biological interactions means that it is necessary to analyze the natural disturbance regime at the potential dredging or disposal site and its relation with the associated benthic communities for effective management.

b. Consequence of Impact to Uses

Most regulatory decisions pertaining to dischargers are made on a case-by-case basis with the primary intent of facilitating the use rather than protecting the environment. Use of the Monterey Bay area for discharges is considered as an alternative without any special consideration of the area's nationally significant resources and qualities. Human uses that cause such discharge are not discouraged or caused to decrease. Therefore, from the perspective of the Sanctuary certain gaps remain in the regulatory framework. For example, EPA approval is needed for ocean dumping and for any location of a new ocean outfall. EPA regulations take the ecological productivity and sensitivity of an area into

consideration; nevertheless, such regulations do not guarantee that EPA will prohibit the disposal of waste in the area based on threats to Sanctuary resources and qualities.

Desalination activities may not only provide freshwater but with associated impacts to marine resources the activities may also impact commercial or recreational fishing activities, intertidal nature viewing, and public access and recreation. New desalination plants could also lead directly to new development projects, and a resulting increase in population migration to coastal areas. Desalination projects that occur on a case-by-case basis development could occur in the proximity of each plant which may interfere with regional consideration of cumulative impacts to the coast and adjacent ocean environments.

2. Sanctuary Alternative (Preferred)

a. Consequence of Impact to Resources

The proposed regulations prohibiting discharge or deposit of materials or other substances without NOAA approval complements the existing regulatory system, would enhance the area's overall recreational and aesthetic appeal, maintain the present good water quality in the Sanctuary, and help protect Sanctuary resources. By maintaining high water quality in the Monterey Bay area and regulating discharge activities from an ecosystem-wide perspective the impact of this regulation is predicted to protect the resources and qualities of the Monterey Bay Sanctuary above that of the status quo.

As the Sanctuary will not be terminating any existing uses that discharge into the Sanctuary it is only possible to predict that the Sanctuary will have a positive impact by restricting and potentially prohibiting future uses that threaten the resources and qualities of the Sanctuary. For example, it is possible to state that the prohibition on oil and gas activities resulted in an elimination of an estimated 302,000 barrels of muds and cuttings and 225 million barrels of formation waters that would have been discharged during the lifetime of potential OCS development off central California. Without specific information on magnitudes, qualities and frequencies of future disposal activities and an estimate of the corresponding threats to the environment no accurate analysis can be determined on the exact beneficial consequences of this Sanctuary regulation to the resources and uses of the Monterey Bay area.

b. Consequence of Impact to Uses

The impact of this regulation is expected to be beneficial to the users of the Monterey Bay area. The requirement of Sanctuary certification or other approval of permits for municipal outfall and dredge disposal will ensure that these potentially harmful activities receive special consideration from the Sanctuary viewpoint and will not only protect the areas resources and qualities but uses such as aquaculture, research institutions, aquariums, fishing and recreation and tourism that depend upon high water quality and uncontaminated background seawater supplies.

Another positive effect of the regulations will be that by

working within the existing regulatory process NOAA can provide and coordinate data from existing studies that can be used to make better informed management decisions by all agencies including the Sanctuary. For example, DDT and its degradation products have been found in the tissues of all eight species of marine fishes caught and analyzed from Monterey Bay (Shaw, 1972). The California Department of Fish and Game in cooperation with the California Department of Health Services is conducting an aquatic toxicology evaluation program in Monterey Bay (Welden, 1988). The main objectives of the program are to determine the average chemical contaminants found in a range of the most common commercial and sport-caught fish in the bay and to give a current risk-assessment of the effects of consuming them. This study was scheduled to be released in the fall of 1989 but has not yet been released. Sanctuary management can use this data to attempt to formulate management measures to address and possibly mitigate the source of the pollution to assist in achieving a more healthy and productive fishery.

Finally, users of the Monterey Bay area for discharges and deposits will not be prohibited from conducting their activities with designation. Discharges are allowed subject to all prohibitions, restrictions and conditions validly imposed by any other authority of competent jurisdiction, provided, however, that NOAA may regulate the exercise of these existing permits or other authorizations to achieve the purposes for which the Sanctuary was designated.

NOAA will also review applications for non-preexisting permits and other authorizations (and applicants must provide timely notice of the filing of the applications and any additional information NOAA deems necessary) and either approve them, approve them with terms and conditions, or disapprove them to ensure Sanctuary resources and qualities are protected.

NOAA intends to consult with scientific institutions and local, State and regional organizations such as the Association of Monterey Bay Area Governments, as well with the owners, holders of or applicants for any authorization or right and the relevant permitting authorities of these activities to determine means of achieving the Sanctuary purposes. The Association of Monterey Bay Area Governments acts as a clearing house in the Monterey Bay area for permits or licenses that require multi-agency review and comment. An opportunity exists to coordinate the necessary data analysis and research and consult within the existing regulatory framework to achieve water quality that is consonant with Sanctuary designation.

If additional conditions are necessary, NOAA will work with the permittees and permitting authorities to determine the necessary level of conditions to provide adequate protection of the proposed Sanctuary's resources. Procedures to ensure efficient administration of NOAA certification and other approval processes are laid out in the proposed Sanctuary regulations and the details are being refined in consultation with other agencies through an MOA. In general, NOAA intends to work with existing authorities to

formalize the consultative and management role of the Sanctuary and increase Federal, State and local cooperative efforts to achieve the agencies mutual goals.

For example, the requirement of NOAA certification of existing permits for municipal sewage outfalls will ensure NOAA consideration of potential impacts on Sanctuary resources and qualities. The NOAA certification process will be coordinated with EPA and State and Regional Water Quality Control Boards. NOAA approval of future permits for municipal sewage outfalls is necessary in order for such outfalls not to be subject to Sanctuary regulatory prohibitions and will ensure protection of Sanctuary resources and qualities.

Thus, if a city or town were discharging sewage effluents into the Bay pursuant to a valid National Pollution Discharge Elimination System (NPDES) permit issued prior to the effective date of Sanctuary designation, the city or town could continue to discharge under the permit without being in violation of the discharge prohibition by requesting certification of the permit in accordance with the proposed Sanctuary regulations. The Director would then impose on the exercise of the NPDES permit such terms and conditions as he or she deems necessary to achieve the purposes for which the Sanctuary was designated. Sanctuary management will be empowered to take into account when reviewing proposed NPDES permits the sensitivity of Sanctuary resources and qualities such as finfish and shellfish populations to municipal discharge effluents. Such discharges would remain subject to all

prohibitions, restrictions and conditions imposed by any other authority of competent jurisdiction.

The requirement of secondary discharge is only expected to have a minimal impact as only the cities of Santa Cruz and Watsonville are currently discharging at primary levels. The City of Santa Cruz has already been required to up grade to secondary treatment by 1992. The City of Watsonville has only just received a 301H permit, thus it will have five years to install the necessary equipment to upgrade to secondary before its permit will need to be renewed.

In reviewing existing or future permits, licenses, approvals, or other authorizations NOAA intends to encourage best available management practices to minimize non-point source pollution entering the Sanctuary and to require at a minimum secondary treatment and tertiary treatment as appropriate or necessary depending on the threat to Sanctuary resources and qualities, for point source pollution, such as municipal sewage discharge.

Sanctuary certification of authorized dumping and dredging activities will be done in coordination with the Harbor Masters, COE, EPA, RWQCB and Regional Water Quality Control Board Waste Discharge Requirement (WDR).

WDRs include prohibitions and discharge limitations including limited time intervals for disposal (WDR No. 88-73 and WDR No. 88-68). In the case of the Moss Landing WDR (No. 88-73) and the Santa Cruz WDR (No. 88-68), there are also provisions that if the spoils are clean enough it is encouraged that they be used for beneficial

beach nourishment. NOAA can work within this existing process to ensure that these requirements are in place, enforced and adequate to protect the resources of the Sanctuary.

Use of designated ocean disposal sites, SF-12 and SF-14, under existing 404 permits would continue but would have to be modified upon Sanctuary designation to take into account the more stringent evaluation requirements under section 404 which classifies Sanctuary areas as "special aquatic sites" rather than a "waters of the U.S." classification as currently used under the MPRSA.

NOAA, in cooperation with Moss Landing Harbor District the Central Regional Water Quality Control Board and EPA will review and monitor these activities and recommend modifications to existing permits if there is evidence that such activities injure or threaten Sanctuary resources and qualities.

NOAA will ensure that Sanctuary research data is applied to the certification process and that environmental data is carefully analyzed and used in the certification of the permit.

Ocean disposal of any materials dredged from a site where pollution is possible must be preceded by bioassay tests to determine the effect on aspects of the marine environment. The test results will determine whether any material from Moss Landing and Santa Cruz may be legally dumped at any ocean disposal site in the area under Title I. The Sanctuary requirement of certification will assure review for possible impacts without imposing undue burdens.

Any proposed dumping of dredge spoils will be reviewed for the

effects on Sanctuary resources and qualities, e.g., the benthic environment and any local populations of algae and kelp. The negative impacts of ocean dumping and dredge disposal include smothering of benthic organisms, increase in water column turbidity resulting in potential damage to industry that requires pollutant-free water (such as for cooling purposes, refractories etc.), mariculture operations, shellfish harvesting, commercial and sport fishing and the negative aesthetics due to odor and water discoloration to contact and non-contact water recreation.

The regulation may impose additional costs by requiring the use of more expensive dredge disposal methods or dumping sites. The regulation could also result in additional costs if the Director were to determine that a higher level of treatment or other, more expensive sewage disposal methods were preferable to disposal in the Sanctuary. It is difficult to predict accurately the economic impact of this regulation without analyzing specific proposals. The application of this regulation to dumping and dredge disposal adds further protection of the resources and qualities to that afforded by the existing legislation.

In addition, the COE and EPA are investigating a new ocean disposal site off of the Golden Gate and NOAA recommends pursuing only those study sites either beyond 12 nmi from the western boundaries of the MBNMS and GFNMS Sanctuaries or within 12 nautical miles only if data can show that there are no detectable concentrations above normal ambient values, of any waste within 12 nautical miles of either national marine sanctuary.

NOAA will specifically work with EPA regarding the designation of new sites under Title I, Section 102 of the MPRSA [near] to the Sanctuary and specifically the issuance of section 404 permits between the two GFNMS and MBNMS Sanctuaries to avoid possible negative impacts to either GFNMS or MBNMS. Consultation with EPA regarding the designation of any new ocean disposal site [near] to the Sanctuary will undertake to determine if there "is identifiable progressive movement or accumulation, in detectable concentrations above normal ambient values, of any waste within 12 nautical miles of any shoreline [or] marine sanctuary designated under Title III of the MPRSA," (40 CFR 228.10(c)(1)(i)). If the effects of the activities at the disposal site are determined to be categorized in Impact Category I then the required Impact Analysis, generated by EPA, maybe used by EPA and NOAA as a basis for modifying the disposal site's use, including withdrawal of its designation.

The effects of the discharges from desalination will depend on the particular constituents of the discharges and the conditions of the ocean area where the discharges will occur. Impacts to marine resources need to be studied both in the field and laboratory. Particular studies would be focused at the location of the outfall including dilution studies, inventory of organisms in the area and pre- and post-operational monitoring.

Finally, the Sanctuary would investigate all of the proposed desalination activities on a cumulative basis with regards to their combined impact on the entire Sanctuary ecosystem.

D. Historical Resources

1. Status Quo

a. Consequence of Impact to Resources

Many cultural and historical resources are known to exist in the area but few have been specifically examined and protected, particularly verification of sites and significance of shipwrecks. Generally, the area's potential as a baseline indicator of regional environmental conditions of interests to marine scientists and archaeologists appears under utilized; such an integral mechanism for assessing the adequacy of resources protection efforts is being ignored.

To date, surveys of the study area's submerged lands for historic resources have been limited. The Bureau of Land Management (BLM), now MMS, for example, conducted a 1979 survey of the shipwreck literature in central and northern California as part of its EIS for lease Sale #53. This agency is required by law to consider potential disturbance and damage mitigation actions for significant underwater historic resources if oil and gas activities are proposed nearby.

b. Consequence of Impact to Uses

Current activities will continue under the status quo without any special protection to historical sites beyond state waters and to the ecological impacts of taking historical resources throughout the Sanctuary. There would be no special requirements for private sector users such as treasure salvors and recreational divers or public sector agencies such as the Navy, to consider the

historic and ecological consequences of their impact from a Sanctuary perspective.

2. Sanctuary Alternative (Preferred)

a. Consequence of Impact to Resources

This regulation is aimed at protecting historical resources (as defined in the program regulations, this term includes cultural, archeological and paleontological resources) from damage and/or removal. The proposed Sanctuary regulations provide for issuance of a NOAA permit to further salvage operations in connection with an abandoned shipwreck in the Sanctuary title to which is held by the State of California.

NOAA will thus be able to ensure that all parties affecting historical resources within the Sanctuary conduct their activities in a systematic fashion according to recognized archeological procedures, that the activity is conducted consistent with the NHPA and finally that the proposed user consult with the California State Historic Preservation Officer.

As part of the Sanctuary management regime NOAA intends to research the number and type of historical resources within the boundaries of the Sanctuary. This research will further our understanding of how to protect these resources so that they are available for future generations.

Historical resources are defined to mean resources possessing historical, cultural, archaeological or paleontological significance, including sites, structures, districts, and objects significantly associated with or representative of earlier people,

cultures, and human activities and events. Thus any inundated prehistoric aboriginal sites and associated artifacts, as well as shipwrecks would be included in the resource protection regime of the proposed Sanctuary.

NOAA will also seek National Register listing of identified resources located in the Sanctuary under the National Historic Preservation Act. Listing would make available grant and survey funds from the Secretary of the Interior (Heritage Conservation and Recreation Service) to be used to identify resource distributions and assess their significance. Placement on the National Register also ensures careful review of proposed Federal activities which could adversely affect identified resources. However, listing does not prevent removal or damage of the resource by non-Federal entities.

Historical resources in the marine environment are fragile, finite and non-renewable. This prohibition is designed to protect these resources so that they may be researched and information about their contents and type made available for the benefit of the public.

b. Consequence of Impact to Uses

The proposed regulation should not significantly affect existing activities within the Sanctuary. However, new coastal development activities such as desalination and discharge outfall construction will need to consider the proximity of historic resources to their proposed activity to avoid potential injury to these valuable resources. Users such as Navy salvage operations,

recreational divers and treasure salvors will have to receive a Sanctuary permit if their proposed activity would violate the Sanctuary regulation.

NOAA can also impose penalties of up to \$50,000/day for infractions of this regulation to enforce NOAA's responsibility for the proper management of historic artifacts.

This prohibition does not apply to accidental moving, possession or injury during normal fishing operations.

E. Alteration of or Construction on the Seabed

1. Status Quo

a. Consequence of Impact to Resources

Loss of resources, habitats and degradation of water quality will continue with the predicted increase in activities that involve alteration and construction of the seabed.

Sand mining in the area is causing loss of benthic habitat and erosion of the seabed (Evaluation of Request for Renewal of Permits for the Monterey Sand Company by Kendell and Bitterman, 1988). A sediment budget analysis performed for Monterey Bay indicates a budget deficit. This signifies an erosional rather than a depositional trend for the Bay (Oradive, 1986). The results of the analysis indicate that about 2.1 million cubic yards of sediment are deposited annually into the bay while an estimated 2.34 million cubic yards of sediment are lost annually. Sediment deposition occurs from cliff erosion, river discharges, and longshore drift, with over half of the total coming from the river discharges. Sediment losses occur from deposition into the submarine canyon, sand mining operations, off-shore deposition by rip currents, and eolian sediment transport to the dunes.

Longshore transport along the bay is generally in a southerly direction. The discharge of sediment from the San Lorenzo, Pajaro, and Salinas Rivers has, through the ages, combined with this southerly transport and the prevailing northwesterly breeze to build the expansive sand dunes along the bay (McGee, 1986). Erosion of the beach has occurred in the vicinity of this mining

and some researchers believe it has increased because of the mining (Griggs, 1986; McGrath, 1986, 1987). Combellick and Osborne (1977) state that mining and weak longshore transports of new sand are the principal factors causing erosion. Because most sand transported along the northern bay is lost to the submarine canyon, the only source of suspended sand in the southern bay is the Salinas River. This river source does not appear to be adequate to support sand mining without erosion occurring. Porter et al. (1979) concluded in 1975 that the quantity of sand supplied to the southern beaches from the Salinas River is inadequate to consider the mined sand as a renewable resource (in Clark and Osborne, 1982). The major source of the mined sand thus appears to be the historic and current erosion of the nearshore sand dunes. Current State Lands Commission leases and Corps of Engineers permits are being reviewed. Additionally, an environmental impact statement has been required by the Corps of Engineers for renewal of local sand mining permits.

The limited dredging and disposal activities at current frequencies, magnitudes and quality in the proposed Sanctuary area do not appear to pose a significant threat to the resources of the area. Disposal of clean sand dredge material on beaches assists with beach replenishment projects. Disposal at the head of the Monterey Canyon does not appear to significantly injure benthic invertebrate populations due to the resilience of these communities to natural seabed disturbances (see analysis for dredge disposal consequences of impacts under status quo for discharges and

deposits). However, new disposal at sites other than the head of the canyon is likely to cause an increase in turbidity and destruction of benthic communities.

b. Consequence of Impact to Uses

Dredging, dredge disposal, and related uses involving seabed alteration are not presently extensive in the study area (see Part II, Section 2). Ocean disposal of dredge spoil from local harbors is an ongoing activity and in certain cases is deposited on shores for beach nourishment. Certain activities, such as routine harbor and navigation maintenance are also vital for the local economy and safety of the users in the proposed Sanctuary.

However, if the pace of activities or demand for uses such as sand mining, strip mining and ocean mineral mining accelerate substantially in the future there is a potential for severe environmental threats to the resources of the Monterey Bay area. These activities are known to increase the turbidity of the water column, disturb and alter benthic communities on the ocean floor, and alter natural erosion and sedimentation rates.

Once again the regulatory regimes responsible for these uses may not take into account the ecosystem perspective or sensitivity of area resources and qualities.

2. Sanctuary Alternative (Preferred)

a. Consequence of Impact to Resources

Over the short and long term, human intrusion upon marine

wildlife, along with potentially adverse impacts on their food supplies, e.g., benthic and pelagic fish resources, will be minimized by regulating activities that alter the seabed and Sanctuary habitats.

Dredge and dredge disposal activities are not extensive within the preferred alternative's proposed Sanctuary boundaries (see Part II, Section 2); nevertheless, unrestricted alteration of, construction on, or drilling of the seabed represents a potential threat to marine resources. Foremost among these adverse impacts would be increased turbidity levels, disruption or displacement of benthic and intertidal communities, and human intrusions near marine bird and marine mammal concentrations. This proposed regulation will allow limited and ecologically sound dredging (particularly along the mainland and in harbors) at levels fairly certain not to harm breeding grounds, haul out areas, and foraging areas.

b. Consequence of Impact to Uses

Overall there is expected to be a positive impact to the users of the Monterey Bay area. No activities are proposed to be terminated with designation and only new sand mining and ocean dredge disposal will be prohibited with Sanctuary designation. However, there are no new proposed designations for disposal sites and dredge disposal within the proposed Sanctuary area. Sand mining can continue until expiration of current permits. After expiration of existing permits sand mining activities will still be allowed pursuant to other state and federal regulations in areas

above mean high tide. Thus no severe economic impacts upon commercial firms are expected.

Harbors are excluded from the boundaries of the Sanctuary and these special areas and uses would continue to be managed by the status quo and not be impacted by the Sanctuary. Beyond the harbor exclusion zones, dredging at current rates and magnitudes would be allowed for navigational projects, such as dredging of navigation channels and installation of navigation aids. The regulation of projects for docks and piers in the nearshore area will remain the responsibility of the existing regulatory authorities.

The regulation prohibits persons from placing objects on the seabed, such as but not limited to artificial reefs, new mariculture operations, pipelines and outfalls unless relevant permits are reviewed and approved by NOAA. The prohibition also includes placement or abandonment of any structure or material on the seabed, which includes vessels that run aground and thereby helps ensure that the owners and operators are responsible for their removal.

Existing holders of authorizations have an obligation to seek certification from NOAA of their authorizations. Existing activities, such as dumping of dredge spoils or other waste would be monitored by NOAA and NOAA may require conditions on their existing permits if it determines that these activities injure a Sanctuary resource or quality.

The activities exempted from this regulation will be monitored by the Sanctuary manager, based on information supplied by the EPA,

COE, the State Lands Commission and the California Coastal Commission. If the data collected demonstrate that a greater degree of Sanctuary oversight is appropriate, amendments to the regulations could be proposed.

F. Taking Marine Mammals, Turtles and Seabirds

1. Status Quo

a. Consequence of Impact to Resources

The abundant and diverse marine mammals and seabirds that exist in the Monterey Bay area currently use their habitats in close proximity to a number of human activities. So far there is no specific evidence that marine mammals, turtles or seabirds are threatened by any one activity. However, a number of conflicts potentially exist between human and marine mammal and seabird uses of the Monterey Bay area. Specifically, sportdivers compete with Sea Otters for abalone and commercial fishery nets may threaten diving seabirds and submerged marine mammals.

The current regulatory regime under the U.S. Departments of the Interior and Commerce gives each Department the authority to designate and protect oceanic habitats if found to be "critical," for species listed as "endangered" under the Endangered Species Act (ESA). The Marine Mammal Protection Act (MMPA) and the ESA prohibit the "taking" of marine mammals and threatened or endangered species. The Migratory Bird Treaty Act prohibits the hunting of seabirds. The term "taking" has been interpreted broadly by the administering agencies, so that the ESA and MMPA provide considerable protection. However, the potential threats to marine mammals and endangered species range from direct injuries to a specific animal or population to indirect or cumulative degradation of their habitats. Neither the MMPA nor the ESA fully prevent such degradation of habitats. Section 7(a) of the ESA

does provide protection against actions which jeopardize endangered species or their critical habitats, but this section applies only to activities authorized, funded or carried out by Federal agencies, not to private or state actions. There is no explicit provision for the designation or protection of marine mammal habitats under the MMPA. Thus, the MMPA and the ESA both provide some protection to the marine mammals and seabirds of the Sanctuary by prohibiting the taking of specific species protected under those acts. However, these acts only provide protection to these species on a case-by-case basis without consideration of their role in the ecosystem or from the special purview of the Sanctuary management regime.

A portion of the habitat area used by marine mammals and seabirds foraging at Monterey Bay is already protected under the National Marine Sanctuary Program. The nearby GFNMS provides protection for marine habitats used by mammals and seabirds, but Monterey Bay, which is an important feeding ground for many of the same mammals and seabirds and which also supports a unique combination of benthic organisms, is not similarly protected under the present regime.

With the exception of the Title III of the Marine Protection, Research and Sanctuaries Act (MPRSA), no Federal authority currently exists to identify and protect localized marine habitats of exceptional importance to non-endangered species. However, Title III of the MPRSA has never been implemented in the Monterey Bay area. Also, while the Marine Mammal Protection Act (MMPA) and

the Migratory Bird Treaty Act proscribe the hunting and taking of marine mammals and seabirds, they do not protect their habitats from potentially adverse uses. Such program deficiencies have left certain valuable marine habitats largely unprotected. If current uses intensify and seriously threaten resources, the lack of suitable management authority to intervene could allow undesirable environmental impacts to the seabirds, marine mammals and turtles of the area.

b. Consequence of Impact to Uses

Currently the status quo strictly enforces the taking of marine mammals and seabirds under relevant legislation. Fishing activities that potentially take marine mammals and seabirds are required to have observers on board to monitor the extent of the mortality. Researchers studying marine mammals are required under the MMPA to obtain a permit for their activities.

2. Sanctuary Alternative (Preferred)

a. Consequence of Impact to Resources

The proposed regulation would overlap the MMPA, MBTA and ESA but also extend it consistent with the intent of the MPRSA to protect the Sanctuary resources on an environmentally holistic basis. The proposed regulation would provide this protection effectively including all marine mammals and turtles in the Sanctuary and seabirds in or above the Sanctuary.

b. Consequence of Impact to Uses

NOAA enforcement officials would be able to consider taking

cases in the Sanctuary along the same lines that they now consider them under the Marine Mammal Protection Act (MMPA), the Endangered Species Act (ESA) and the Migratory Bird Treaty Act (MBTA).

The regulation would not preclude a number of current activities from continuing. For example, scientific research on marine mammals and seabirds as research on Sanctuary resources is encouraged as part of the Sanctuary mandate. To facilitate this research the proposed regulations allow the issuance of Sanctuary permits for research. If the research is on Federal or State designated endangered species the researchers are already required to obtain permits from the relevant management agency. These permits will also need Sanctuary approval to ensure the goals of the Sanctuary are met.

As another example, NOAA will work with existing fisheries management agencies as well as National and local fishery organization (e.g., the PCFFA) to ensure that the incidental taking of seabirds and marine mammals in commercial fishing nets is minimized and that the existing permits that govern this incidental take fulfill the purposes for which the Sanctuary is designated.

Finally, rehabilitation of injured, and studies on dead seabirds and marine mammals, would be permitted under these Sanctuary regulations if necessary in response to an emergency threatening life, property, or the environment or pursuant to a Sanctuary research permit.

G. Overflights

1. Status Quo

a. Consequence of Impact to Resources

There have been reports of low-flying aircraft (below 1000' AGL) in areas of Monterey Bay which have startled bird populations and caused stampedes of marine mammals. There are a number of small, private airfields in the Monterey Bay area and often small planes can be observed flying along the coastline. Low helicopter overflights have also been known to cause the drowning of sea otter pups as parents desert the young when disturbed by the noise and downdraft of the helicopter's rotor blades. Low aircraft overflights (below 1000 feet) have been observed regularly to disturb bird and mammal communities in the neighboring Gulf of the Farallones National Marine Sanctuary.

The California Department of Fish and Game regulations that presently prohibit overflights less than 1000 ft above the Año Nuevo Reserve, Point Lobos Reserve and the California Sea Otter Game Refuge appear to provide adequate protection to the resources of these particular areas from visual and acoustical disturbances from aircraft but are limited in their offshore extent. In addition, although the Federal Aviation Administration charts and NOAA's San Francisco Sectional Aeronautical Chart indicates on the chart a Notice to Pilots that prohibits flights below 1000 ft (305 m) Above Ground Level (AGL) over the Año Nuevo and Point Lobos State Reserves and the California Sea Otter Game Refuge other sensitive areas to the north of the Refuge at Carmel Bay are not

protected.

Persistent low altitude overflights can severely disrupt various marine mammal and seabird behavior patterns, particularly those of breeding and nesting.

b. Consequence of Impact to Uses

Currently only a few commercial charter airplanes are providing opportunities to view marine mammals and seabirds from the air but these uses can be expected to increase. A seaplane operation based out of Santa Cruz provides a service for visitors who wish to observe Monterey Bay from the air.

Small private planes often fly low along the coast to view the coastal environment and this use can also be expected to increase with the growing population in the area.

Any potential OCS leasing would involve an increase in air traffic from helicopter overflights servicing offshore platforms from coastal support facilities.

2. Sanctuary Alternative (Preferred)

a. Consequence of Impact to Resources

This prohibition is intended to protect marine birds and mammals from the disturbance and harassment of low-flying aircraft. For example, seabirds congregated near the shoreline, pinniped haul-out areas, and sea otters among the kelp beds are all primarily concentrated within these three zones.

In particular, adjacent water areas where marine animals forage would receive additional protection from potentially

disruptive overflights. The 1000 ft (305 m) minimum height parallels the National Marine Fisheries Services's selective prohibition of overflights under 1000 ft (305 m) in areas where marine wildlife harassment is likely.

This regulation will contribute to the protection of natural undisturbed behavior patterns of marine mammals and birds concentrating and breeding along island and mainland shorelines.

Marine mammals and birds are highly susceptible to disturbance from low-flying aircraft. Sanctuary management experience with similar regulations in the Channel Islands and Gulf of the Farallones National Marine Sanctuaries has revealed that one can enforce such regulations from the ground by observing the Identification Numbers on aircraft flying below 1000' and then reporting the incident to the appropriate airfield. NOAA will monitor the current status and future trends of overflights to determine if the regulation of overflights should be expanded to protect additional areas.

b. Consequence of Impact to Uses

Private recreational overflights outside the restricted area, which occur regularly but almost entirely along the mainland coast anyway, e.g., for whale migration watching, would not be affected if beyond three miles of mean high water. Over the prohibited zones private planes will still be able to enjoy general scenic and whale observation opportunities, albeit from altitudes of 1000 feet (305 m) or above.

NOAA has received no reports of low-level military overflights

over sensitive areas. NOAA has consulted with the Department of the Navy and determined that current Navy flight operations appear to be executed at a safe distance from mammals and seabirds. If low-level overflights were to occur after Sanctuary designation, NOAA will identify and consult with the responsible Department as provided for in Article 5 of the draft Designation Document.

Uses of the area's air space necessary for National Defense or to respond to an emergency threatening life, property, or the environment, such as Coast Guard search and rescue operations and enforcement operations, would be exempted.

Because no commercial airlines fly regular routes over the prohibited zones at these low altitudes, this regulation should pose no burden on commercial carriers.

Helicopters servicing offshore oil and gas platforms would be required to fly over 1000' if passing over the prohibition zones. However, as oil and gas development is prohibited within the Sanctuary the consequences of this regulation to this type of overflight is expected to be minimal.

Aircraft that need to fly below 1000 feet within these zones for research purposes would require a Sanctuary research permit which would be processed expeditiously to ensure that while Sanctuary resources and qualities are protected there would only be a minimal administrative burden on the applicant.

H. Operation of "Personal Water Craft"

1. Status Quo

a. Consequence of Impact to Resources

The high density of inshore flora and fauna and vulnerability of these resources to personal water craft warrants protection from this activity. Personal water craft are capable of travelling at speeds which allow insufficient time for some marine species to avoid the vessels. For example, in August, 1990, a jet skier reportedly ran over sea otters near the Coast Guard Pier in Monterey Harbor. Officials found at least one injured otter immediately afterwards. The likelihood is great for such events to occur again in the future. These risks may also apply to harbor seals, sea lions, sea turtles, some fish species and marine birds.

b. Consequence of Impact to Uses

Personal water craft are a relatively new form of water sport and in the Monterey Bay area are currently only operated in small numbers and usually only during the summer. However, the abundance and rapid growth of other uses of the area, including recreational water-sports, warrants a long-term perspective on the management of uses of the proposed Sanctuary. In addition, there is growing awareness of conflicts with other user groups of the area that has recently resulted in the promulgation of specific regulations intended to minimize these conflicts.

The State of Hawaii has already proposed regulations that would permit operation of personal water craft only in specified areas, in part to avoid injury to neighboring marine mammals. If

the use of personal water craft were to increase, and/or other uses or resources of the Sanctuary were threatened by personal water craft, then the Sanctuary manager will investigate the issue in coordination with the affected parties and propose possible management and/or regulatory measures.

2. Sanctuary Alternative (Preferred)

a. Consequence of Impact to Resources

This regulation is intended to reduce negative impacts of this activity on coastal populations of marine mammals and seabirds that are especially vulnerable to disturbance and injury from this activity. Zoning of this activity away from the kelp beds and estuaries of the area will prevent conflicts with sea otters and fragile estuarine communities.

b. Consequence of Impact to Uses

Overall the impact of this regulation should be beneficial to users of the area. Many conflicts that currently arise from interference between personal water craft operators and other recreationists will be avoided by moving the personal water craft beyond the areas of other recreational activities. Personal water craft operators will still be able to participate in this activity within areas close to areas traditionally used and near to coastal access points.

I. Vessel Traffic

1. Status Quo (Preferred)

a. Consequence of Impact to Resources

Most intentional discharges of oil from vessels (and some releases of air pollutants) generated during loading and off-loading are explicitly regulated by existing regulations. Other potential threats due to vessels, such as noise and visual disturbances, propeller hits, grounding, and accidental oil spills, are not (and in certain instances cannot be) controlled or prevented.

Disturbance from vessels could result in flight or other changes in behavior. Repeated disturbances may cause mammals to temporarily or permanently abandon an area. Trash disposal can cause injury to marine resources from ingestion and entanglement. Recent implementation of Annex V of MARPOL by the United States makes it illegal for any vessel to dump plastic trash anywhere in the ocean or navigable waters of the United States and illegal to dump other types of garbage in the ocean depending on the type of garbage and the distance from shore (see Appendix C for details of these restrictions).

However, the threat to coastal and marine resources and qualities from vessel traffic appears to be most severe from large oil tanker and barge spills. The recent disaster of the Exxon Valdez grounding off Valdez, Alaska, highlights the severe environmental and socioeconomic damage that results from oil spills in the marine environment. Recently there were three such tanker

oil spills on the East Coast: one each in Rhode Island and Texas on June 23, 1989; and one on the Delaware River near the Port of Philadelphia on June 24, 1989. The largest of these resulted when the Uruguayan oil tanker President Rivera ran aground near Philadelphia, releasing 298,000 gallons of oil into the Delaware River. At Narragansett Bay, the Greek-registered World Prodigy grounded on Brenton Reef near Newport, dumping 300,000 gallons of oil. In Texas, the tanker Rachel B. collided with a barge resulting in 252,000 gallons of oil spilling into the Houston Ship Channel.

According to the U.S. Coast Guard, Marine Pollution Retrieval System (July, 1989), since 1973 there have been an average of just under 10,000 oil pollution reports per year. Since 1980 there have been 588 incidents of 10,000 bbl or greater (43 tankers, 109 barges, 58 miscellaneous vessels and 378 non-vessel incidents). In the year 1988 alone there were 5.5 million gallons of oil spilled, of which 60% was attributable to vessels.

Four spills have recently occurred off the West Coast: the tanker Puerto Rican near San Francisco in 1984, the oil barge Nestucca off the coast of Washington in 1988, the Exxon Valdez near Valdez, Alaska in March, 1989, and the American Trader in 1990. The Exxon Valdez disaster has received much publicity and scientific investigations are currently underway on the long-term effects of the spill and possible future management measures (CMC, 1989).

The example closest to Monterey Bay was the Puerto Rican

spill. This tanker was disabled about eight miles seaward of the Golden Gate by on-board explosions. The vessel eventually broke apart and discharged refined oil products within the boundary of the Gulf of the Farallones National Marine Sanctuary (GFNMS). The progress of this incident demonstrates the seriousness of the potential hazard to Monterey Bay.

The Puerto Rican was disabled shortly before the predicted onset of the Davidson current, which reverses the direction of California coastal currents from a southerly to northerly flow (See Part II, Section II). The wind and current direction in the San Francisco Bight, however, was still to the south and initial trajectory estimates indicated that spills occurring in the area would move southward. It was therefore decided to tow the burning vessel out to sea, south of the Farallon Islands. The ship broke apart southwest of the Farallon Islands and the resulting spill did move southward initially. Unexpectedly, wind and current direction changed and the spill moved rapidly north through the Gulf of the Farallones National Marine Sanctuary and up to Bodega Bay and beyond.

Some 48,000 barrels of hydrocarbons were released into the ocean from the Puerto Rican. Of this amount, only 1,460 barrels were recovered during cleanup operations (USCG, 1985). This spill killed an estimated 2,874 seabirds, and did an unquantified amount of damage to water quality, fishery resources, marine mammals, and human uses. By comparison, in February, 1986, the tanker barge Apex Houston spilled some 600 barrels of oil along the central

California coast killing an estimated 9,817 seabirds within the Gulf of the Farallones National Marine Sanctuary.

b. Consequence of Impact to Uses

Given the expected increases in vessel traffic, and the potential for vessel accidents and oil spills and the risks of vessels entering nearshore waters and disturbing marine bird and mammal populations, threats to Sanctuary resources and qualities seems likely to increase.

Although it is impossible to eliminate all probability of such accidents the U.S. Coast Guard is working on proposals to reduce vessel accidents off the shore of California by creating Vessel Traffic Separation Schemes (TSS), an internationally recognized routing measure that separates vessels into opposing streams of traffic through the establishment of traffic lanes; and Shipping Safety Fairways (SSF), where no fixed structures are permitted. Such schemes have to be approved by the International Maritime Organization before they take effect. Once in place adherence to the traffic lanes by vessels is entirely voluntary.

The U.S. Coast Guard was examining extending the existing San Francisco TSS an additional 28 nmi to the south-southeast along the coast to a point approximately due west of Santa Cruz. Two parallel one-mile wide SSF were proposed from the termination of the extended TSS to the Santa Barbara Channel TSS at Point Arguello. With the exception of the waters off Point Conception, the proposed routing system followed current traffic patterns along the coast. Pillar Point was the nearest area of the coast to the

amended shipping lanes (about 5 nmi). Point Sur was approximately 8 nmi away, while Año Nuevo was 10 nmi distant.

This proposal is now on hold and alternatives to the TSS described above are being considered that would provide additional safeguards from the possibilities of collisions and of oil spills reaching the shore of the Monterey Bay area.

The USCG voluntary vessel traffic lanes out of San Francisco currently receive a very high level of compliance. Under the existing regulatory system commercial vessels, including tankers and other bulk carriers may transit anywhere in the proposed Sanctuary, even near the very sensitive nearshore areas, where they could cause visual disturbances and create increased danger of pollution, both from operational discharges and from accidental groundings. Generally, based on good seamanship, large vessels are kept at a considerable distance from the shore.

Local vessel traffic will probably increase considerably with the development of the tracts to be leased in the Central California OCS due to servicing requirements and transportation of produced oil. Many of those vessels may be capable of navigating quite near to Año Nuevo and other offshore areas. Environmental consequences and risks of local tanker traffic associated with central California OCS oil and gas development offshore central California is considered separately under the section on oil, gas and mineral activities.

Generally speaking, few large vessels transiting the study area's customary lanes and adjacent ocean waters have occasion to

enter Monterey Bay. The only exception is oil tankers, originating primarily at San Francisco Bay refineries, which utilize the Bay for nearshore off-loading at the Pacific Gas and Electric (PG&E) power plant. This traffic represents a continuing environmental concern, especially in regard to certain Monterey Bay marine mammal and seabird communities, should oil spills occur either in nearshore transit (due to grounding or collisions) or while off-loading. Vessels presently follow routine and safe entry and exit procedures into and out of the Bay and unload one at a time. The USCG's Monterey station keeps a close watch on these operations with regard to marine environmental protection. No major spills have ever occurred in the Bay although minor accidental discharges have been documented. A proposed expansion of Moss Landing's offshore terminal by PG&E has been withdrawn. Consequently, oil product delivery pattern--at least in term of tanker vessel size--will remain the same, i.e., 50,000 DWT maximum.

2. Sanctuary Alternative

a. Consequence of Impact to Resources

Instead of promulgating a regulation that may not adequately protect Sanctuary resources and qualities NOAA prefers to immediately work with the U.S. Coast Guard to determine an effective action that will provide the greatest possibility of preventing injury to Sanctuary resources and qualities.

In the meantime, Sanctuary resources and qualities will continue to be at risk from this no action alternative with the potential consequences already described above under the Status

Quo.

b. Consequence of Impact to Uses

Without detailed consultation with the U.S. Coast Guard it is difficult to calculate the impact to U.S. vessels affected by a Sanctuary regulation. Immediate NOAA action would effectively only apply to U.S. Flag vessels and would not affect foreign vessels as the action would not have gone through the IMO.

However, immediate action, of any kind, would alleviate some of the public concern that the Sanctuary is vulnerable to vessel traffic impacts to natural resources. Potentially, such NOAA action would also have a positive impact to other recreational and fishing user groups.

J. Fishing

1. Status Quo (Preferred)

a. Consequence of Impact to Resources

What little data exist show that there is minimal impact to the benthic resources on the ocean floor from roller trawling and that both trawlers and gill-netters are now prohibited from fishing in nearshore areas with high concentrations of marine mammals and seabirds, thus helping minimize any incidental taking of these species.

b. Consequence of Impact to Uses

Fisheries in general have benefitted from Sanctuary status at other Sanctuaries in the National Program due to the protection provided to the industry and fish stocks from the negative impacts of ocean dumping, offshore oil and gas development, seabed mining and water pollution. Fishing activities are also predicted to benefit from designation of the Monterey Bay Sanctuary.

Fishing in the Sanctuary is regulated other than under the MPRSA by Federal and State authorities. Designation of the Sanctuary shall have no effect on any regulation, permit, or license issued thereunder, e.g., regulations promulgated under the California Fish and Game Code and regulations implementing Fishery Management Plans promulgated under the Magnuson Fishery Conservation and Management Act, 16 U.S.C. §§ 1801 et seq.

NOAA did evaluate the possibility of proposing some additional Sanctuary regulation of fishing. However, the existing management authorities, the California Department of Fish and Game, NMFS and

the PFMC, have comprehensive management authority over these resources. Moreover, the long-term interest of these agencies parallel those of the Sanctuary -- ensuring healthy stocks and their habitats -- and, by relying on the existing arrangements, NOAA will avoid duplication of regulations and programs.

Thus, the close coordination and consultation which has already been initiated between the PFMC, CDF&G and NOAA indicates that Sanctuary concerns, if any, will be fully communicated to the authorities dealing with these on-going management issues.

Notwithstanding the above, the absence of fishing activities from the scope of regulation does not absolve fishermen from obeying not only existing State and Federal regulations but also Sanctuary regulations, which are designed to protect Sanctuary resources and qualities.

Finally, as part of the Sanctuary research and management regime, NOAA will consider supporting periodic monitoring of the effects of trawling and gillnetting on the Sanctuary resources and qualities. NOAA will also consider the possibility of making funds available for technical assistance for studying the area's marine finfish, shellfish, and algae resources and for strengthening the present enforcement capabilities of the CDF&G and other enforcement entities including the NMFS and the USCG.

2. Sanctuary Alternative

a. Consequence of Impact to Resources

Sanctuary regulations at the time of designation would be intended to protect identified resources at risk from the threat of

fishing activities. As such regulations would require extensive consultation with affected parties and agencies, no major threat has yet been identified, and recent state legislation appears to address many of the potential threats such as from gill nets and roller trawling, there does not appear to be any major benefit to the environment with promulgation of regulations affecting fishing activities with designation.

b. Consequence of Impact to Uses

Sanctuary regulations would add another set of restrictions on the currently heavily regulated fishing industry. Many boats have already been required to move further offshore from ecologically sensitive areas and additional area closures would add to this burden. Potential user groups that would benefit from fishing regulations would involve recreationists and nature watchers if the regulations result in more abundant and healthy fish, seabird and marine mammal populations.

III. Section: Management Alternative Consequences

A. Consequences of Status Quo

Presently, numerous Federal, State, and various other regional and local government agencies are vested with some regulatory authority over specific resources and human activities. However, no single entity has management jurisdiction to govern marine resource use and conservation comprehensively, i.e., for the entire Monterey Bay region. Generally, each has a narrow geographic or functional jurisdiction. Present arrangements, therefore, fail to integrate a breath of scope sufficient for sustained regional resource protection in the offshore environment. Although the importance of individual resources, e.g., endangered species, is on occasion well acknowledged in law and regulatory implementation is often fairly effective, the system under-emphasizes the national significance and preservation priorities warranted by this unique marine environment. Finally, the formal designation of a Monterey Bay National Marine Sanctuary, requires providing a concerted management focus on coordination of existing regulatory arrangements to ensure long-term protection of the exceptional diversity of marine resources in the region.

1. Enforcement

A reliable and effective enforcement capability is also necessary to ensure that regulations are observed. The CDFG has approximately 8 skiffs, two 65 ft. patrol boats (in Monterey and San Francisco), one 30 ft. patrol boat in San Francisco. CDFG staffs a 30 ft. vessel owned by NOAA for patrolling the Gulf of the

Farallones National Marine Sanctuary. No boats patrol all ocean waters from Bodega Bay to Monterey. The 65 ft. vessel in Monterey occasionally patrols the area south of Monterey. (Capt. Phil Helms, CDF&G, Personal Communication; 1989). The two larger patrol boats in the 65 ft. (20 m) class traverse the proposed Sanctuary area out of San Francisco, and Moss Landing from Bodega Bay to Morro Bay. Finally CDF&G has two 100 ft. patrol boats: one originates from the south in Long Beach and patrolling Santa Barbara and Ventura counties, but does not conduct surveillance runs on any regular basis into the proposed Sanctuary's southernmost segment. The other 100 ft. boat, based to the north in Eureka, occasionally heads south through the proposed Sanctuary.

CDFG wardens sometimes patrol the Año Nuevo Reserve mainland, the Point Lobos Ecological Reserve, and California Sea Otter Game Refuge by foot or vehicle; however, no wardens are permanently located at any of these areas. Moreover, patrols by boat or on land are responsible for enforcing not only specific regulations applicable to individual reserves and refuges, but also the entire California Fish and Game Code. Thus, arrangements appear somewhat strained regarding enforcement and monitoring.

Certain enforcement functions in the proposed Monterey Bay Sanctuary area are also carried out by the California Department of Parks and Recreation (CDP&R). For example, although the Año Nuevo State Reserve and the Point Lobos Ecological Reserve were originally designated under CDF&G authority, CDP&R assumed on-site management responsibility. Pursuant to this mandate, CDP&R staff

are permanently located at both areas and conduct regular land-based patrols. They do not, however, have general authority to prohibit diving, fishing, collecting, or other human activities which may adversely affect, e.g., through intrusion, sensitive marine resources. Also, the CDP&R is entirely dependent on the CDF&G for the prosecution of violations occurring beyond the intertidal zone. As a result, actual CDP&R enforcement levels in the study area tend to reflect CDF&G capabilities. The CDF&G occasionally conducts patrols of Año Nuevo and Point Lobos Reserves, but, due to personnel shortages, the CDP&R has assumed primary management responsibility here as well.

The NMFS recently entered into a cooperative agreement with the State CDF&G whereby both parties agreed to enforce each other's regulations. However, due to practical constraints of budget and staffing NMFS enforcement activity has remained largely confined to its own statutory responsibilities.

In view of available State and Federal enforcement staff and the large marine area of approximately 2,200 square nmi (6860 square Km) to be covered, the current enforcement capability appears inadequate.

2. Research and Education

The existing management system contains no mechanism for maximizing the area's research value, e.g., by means of a comprehensive or extended program framework. A variety of organizations conduct significant research in the ocean waters of the Monterey Bay area on an individual basis. The establishment of

a Monterey Bay Marine Geological Consortium has been proposed. The consortium, consisting of the Institute of Marine Sciences-University of California at Santa Cruz, the Moss Landing Marine Laboratories, and the Monterey Bay Aquarium Research Institute, would improve marine geological and geophysical studies of the Monterey Bay and offshore regions. To date, however, no coordinating entity exists to identify regional research information needs or to design strategies for filling them. Thus, scientific research is pursued in a rather fragmented fashion which often fails to incorporate other relevant environmental quality parameters.

Although literature and other educational information on Monterey Bay and its habitat values is available to the general public, these efforts are largely uncoordinated and the collected research is rarely applied to management problems. Tourists, recreational fishermen and, nature enthusiasts who visit the Bay thus have little or no knowledge of its geology or of the complex communities of biota that inhabit the canyon and surrounding waters. Nor do they realize the value of Bay waters to the mammals and birds that feed there or pass through in transit.

B. Consequences of Sanctuary Alternative 1.

This alternative is cost effective as it slowly phases in the necessary management structure in parallel to the growing presence of the Sanctuary and the demands of its users. However, the Sanctuary would initially have low visibility and reduce the

effectiveness of the resource protection regime due to the limited staff. In addition, due to the long coastline boundary of the Sanctuary and the variety of shoreline habitats and user groups, one centralized information center may not provide optimal representation or access to widely separated visitor groups.

1. Enforcement

Gradually NOAA, would provide an enhanced enforcement regime by providing additional boats, personnel and equipment for on the water and surveillance and enforcement. See the Management Plan for possible additional enforcement measures provided by the Sanctuary.

2. Research and Education

Research and education programs should benefit from Sanctuary designation with the implementation of NOAA programs and assistance with coordination. See the Management Plan for possible areas where the Sanctuary could positively impact existing programs.

C. Consequences of Sanctuary Alternative 2 (Preferred)

The preferred alternative would ensure that the Sanctuary program is implemented rapidly and cultivates the public support gained during the early, designation process. The wide variety of opportunities for interpretation as well as research requires the full-time attention of individual research and education coordinators. The Sanctuary Manager will then be able to devote him/herself to the coordination of existing management authorities and resource protection. In the long run this alternative will not

increase the budget of the Sanctuary as all of these personnel will be required for effective management in the future.

1. Enforcement

The impact of enhanced surveillance and enforcement efforts focused on Sanctuary resources should be beneficial. What is proposed is a coordinated emphasis on resource protection in Monterey Bay rather than an elaborate surveillance and enforcement presence.

NOAA, at present, envisions a State-Federal cooperative enforcement system involving the California Departments of Fish and Game and, Parks and Recreation, the U.S. Coast Guard, the U.S. Fish and Wildlife Service, the National Marine Fisheries Service, and the National Park Service. Since the proposed Sanctuary would include both State and Federal waters close coordination between State and Federal authorities would be required.

2. Research and Education

The impacts resulting from implementation of the research and education program are also expected to be positive. The research program will result in a coordinated mechanism for studying Monterey Bay area's resources and developing effective management strategies. The educational program is designed to enhance public awareness of the Bay area resources and the importance of protecting such special marine areas.

The research program would provide a coordinated effort to obtain vital baseline and monitoring data on the resources and on human activities in Monterey Bay area. Information on water

quality and circulation, species density and diversity, fisheries resources and marine mammals and seabirds would be used in assessing the health of the Bay environment and the effects of human activity in the area. This would improve management's ability to develop long-term planning for the Sanctuary and would provide data useful in responding to oil spills.

The educational program would improve public awareness of the importance and fragility of Monterey Bay's resources and thus engender support for resource protection efforts. The program would provide audiovisual material, exhibits, and other information products for individuals, schools and interested groups.

A major responsibility of the Sanctuary manager is the development and enhancement of education and research efforts. As presently envisioned, the Sanctuary Information Center might also serve as the administrative headquarters for the Sanctuary.

The Sanctuary Information Center would be the focus for research and education activity. The Center would collect literature and information on resources and activities in the Sanctuary, and also provide visitor orientation and education materials, such as slides, brochures, and apprise visitors both of regulations and the need for protecting the marine resources. Efforts to develop the Sanctuary Information Center will be coordinated with existing agencies, particularly the State of California Departments of Parks and Recreation and Fish and Game; private institutions, such as the Monterey Bay Aquarium, and other Federal agencies such as the National Park Service, and Fish and

Wildlife Service.

The general information collection would include both technical and non-technical reference material, and would provide as complete and detailed a description of Sanctuary conditions and use over time as possible.

To further this end, the Sanctuary manager would ask researchers to notify the Sanctuary Information Center of any research projects in the sanctuary and to submit reports of their research. This notification process would result in a master listing of research projects conducted from the time of designation. This listing would be continually updated and kept open for public use.

A notification procedure should ensure that research parties are not only familiar with existing regulatory controls, but also that they better understand which resources are particularly susceptible to adverse research-related impacts. In addition, the master listing could: (1) produce a record of scientific investigations which might provide important management information, (2) contribute to efforts to monitor use patterns within the Sanctuary, (3) be of assistance in identifying areas of research not receiving adequate attention, and (4) ensure that Sanctuary managers are aware of relevant area-specific studies and literature. Finally, this notification process would provide both sanctuary managers and researches with a record of individuals and groups who have first-hand experience with the area's resources. This would be a valuable tool in coordinating research efforts and

encouraging multi-disciplinary analyses.

In turn, researchers could benefit from the resources of the Information Center and, unless the research would require a permit notification would not impose any delay. The compilation of technical documents in the Sanctuary Information Center will provide a baseline of site-specific information which would help long-term environmental analysis and encourage further research within Sanctuary boundaries. The Sanctuary manager will directly encourage research by sponsoring a monitoring program, providing partial funding for research, and encouraging researchers and funding organizations to conduct or support studies in the Sanctuary. The monitoring effort will focus on the overall health of the natural resources of the area as well as the level and effects of human activities occurring nearby. The information gained from such monitoring efforts and other research projects should enable NOAA to manage and regulate the Sanctuary more effectively, and to assist other applicable authorities in carrying out their responsibilities.

Another research objective of the Sanctuary managers would be to map and complete a detailed inventory of historical resources. Many of the known wrecks in the area need to be documented and researched. Limited archaeological research has been conducted in the area and active research into, and mapping of, possible historical artifacts in the Bay has been initiated on a small scale (U.S. Bureau of Land Management, 1979c).

IV. Section: Unavoidable Adverse Environmental or Socioeconomic Effects

Specific environmental and socioeconomic effects of each proposed regulation are included throughout the environmental consequences section of the preferred alternative.

The net environmental and socioeconomic effects of designating the Sanctuary and implementing the Sanctuary Management Plan and regulations are estimated to be positive. While such effects are difficult to quantify, the purpose of the Sanctuary in part will be to maintain or improve water quality, fisheries, aesthetics and tourism without causing any adverse effects.

The proposed Sanctuary regulations would allow all activities to be conducted in the proposed Sanctuary other than a relatively narrow range of prohibited activities. The procedures proposed in these regulations for applying for National Marine Sanctuary permits to conduct otherwise prohibited activities, for requesting certifications for existing leases, licenses, permits, approvals, other authorizations or rights authorizing the conduct of a prohibited activity, and for notifying NOAA of applications for leases or other authorizations to conduct a prohibited activity would impose a cost in time and effort on the part of applicants for such permits or certifications and those subject to the notification requirements. However, NOAA will keep such costs to a absolute minimum by working closely with State and Federal regulatory and permitting agencies to avoid any duplication of effort and will set strict guidelines for reviewing applications in

as brief a time as possible.

The regulation prohibiting discharges and deposits and alteration of or construction on the seabed may require permit holders for such activities to seek other areas of disposal or apply higher levels of treatment. All measures, terms and conditions applied to existing activities will be done in consultation with the affected party and the appropriate management agency.

Estimates of revenue foregone by the proposed prohibition of oil, gas and mineral activities within the Sanctuary boundary has been presented in detail under the socioeconomic consequences for this proposed regulation. Balancing the foregone revenue would be preventing adverse socioeconomic effects by the proposed prohibition of and oil, gas and mineral activities. For example, the proposed prohibition may alleviate or remove matters ranging from costs to local communities for developing on-shore facilities to political and legal action resulting from public controversy and apprehension concerning proposed oil and gas activities.

It is not possible to quantify the positive socioeconomic effects of prohibiting OCS oil and gas activities. The recent NAS study (1989) on the Adequacy of Environmental Information For Outer Continental Shelf Oil and Gas Decisions: Florida and California found that "few data have been collected by MMS or anyone else to address the social and economic impacts of OCS activities".

V. Section: Relationship Between Short-term Uses of the
Environment and the Maintenance and Enhancement of
Long-term Productivity

Sanctuary designation emphasizes the importance of the natural and historical resources of Monterey Bay area. The quality of the Monterey Bay environment is still relatively pristine and the healthy and the diverse natural ecosystem is relatively unaltered. Designation will enhance public awareness of the area and provide long-term assurance that its natural resources will be available for future use and enjoyment. Implementation of the preferred alternative ensures that changes in use patterns which degrade the Bay environment are monitored and possibly reversed.

The education, research and resource protection programs will provide information, management and protection that develops a foundation for wise public use of the area and results in long-term productivity. Similarly, information collected in the research program will assist marine natural resource managers in making better management decisions. Better management will in turn help resolve use conflicts and mitigate the adverse effects of human activities.

NAKVAS. PLAN

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I. Section Introduction

The Marine Protection, Research, and Sanctuaries Act of 1972, as amended, and its implementing regulations (15 CFR Part 922) require that a management plan be prepared for each proposed Sanctuary. Once the Sanctuary is designated, the plan will be implemented. The management plan focuses on Sanctuary goals and objectives, management responsibilities and guidelines for the resource protection, research, education and administration programs.

The plan establishes an administrative framework in recognition of the need for cooperation and coordination to ensure effective management. The Sanctuaries and Reserves Division (SRD), National Oceanic and Atmospheric Administration (NOAA), is responsible for management of the site.

Variable funding for staff and program development over the next several years may affect specific aspects of Sanctuary management described in this plan. Modifications to the scope and scale of the programs may have to be made because of such unforeseeable changes in the level of funding. The goals and objectives of the plan will, however, remain unchanged.

Sanctuary goals and objectives provide the framework for developing the management strategies. The goals and objectives direct Sanctuary activities towards the dual purposes of public use and resource conservation and are consistent with the intent of the National program.

The management strategies planned for the proposed Monterey Bay National Marine Sanctuary (MBNMS) are directed to the goals and objectives outlined below. It should be noted that, although the Sanctuary goals are listed discretely, they are actually overlapping. For instance, the research and education efforts both contribute to resource protection and to enhancing public use of the Sanctuary.

The first task upon Sanctuary designation will be to establish liaison with the appropriate agencies to ensure the Sanctuary mandate can be carried out through a cooperative management strategy. Sanctuary staff will meet with other agencies and institutions operating in the area to familiarize them with the Sanctuary mandate and staff, and determine appropriate working relationships. For example, discussions to determine resources most in need of management would take place with California Departments of Fish and Game and Parks and Recreation, State Water Quality Resources Board, Regional Water Quality Control Boards, U.S. Coast Guard, U.S. Fish and Wildlife Service, local businesses, Association of Monterey Bay Area Governments, towns and cities, agricultural and fishing representatives and research institutions.

A Monterey Bay National Marine Sanctuary Advisory Committee (SAC) will be created by the Sanctuaries and Reserves Division to assist the Sanctuary Manager in policy making. The Committee will consist of appointed representatives of government agencies, research and education groups, and commercial and environmental interests.

During the public comment period on the DEIS/MP, NOAA received many requests from Government agencies, environmental organizations, municipalities, research and education groups and private industries as well as individual members of the public requesting participation in the SAC. One of the top priorities for the Sanctuary Manager will be to assist with the creation of the SAC according to the procedures and guidelines required by the Federal Advisory Committee Act (FACA). All groups and individuals will have an opportunity to assist in the development of the SAC via the procedures specified in FACA and its implementing regulations (see Appendix A).

It is intended that the SAC will create subcommittees to assist in developing programs in research, education, resource protection and administration for the Sanctuary. Thus the SAC will play a key role in determining what the management priorities should be, and coordinating Sanctuary actions with those of other agencies.

The Sanctuary staff will work with other agencies to coordinate resource management programs and look for necessary support for such programs. The Sanctuary also will support management-related research and monitoring through funding, staffing, and other means that may be available and appropriate.

Other immediate and high priority activities will include reviewing development or management proposals that will impact upon the marine resources, providing policy advice to other agencies working in the proposed Sanctuary area, and making presentations to

appropriate levels of government.

Another priority will be to assist in coordination and support of existing interpretive and education programs, such as those of the California Department of Parks and Recreation and the Monterey Bay Aquarium. SRD headquarters and Sanctuary staff will review and develop educational materials, signage, interpretive displays and appropriate facilities in cooperation with existing programs. Interpretive information provided to those using the Sanctuary for recreation uses may help them enjoy their visit more and increase their awareness of Sanctuary resources.

The general public and interested organizations in central and northern California will play important roles in attaining resource protection goals in the Sanctuary. Interpretive programs fostering public understanding and, hence, support for management objectives, are inherent in the plan's concept. The establishment of a MBNMS will provide an excellent opportunity to inform the public about the value of efforts to protect its fragile resources and the need for a long-term management framework. Effective communication will depend on publications, exhibits, and special events that convey the significance of the Sanctuary's resources to both the in-state and out-of-state public.

The management plan proposes actions tailored to specific issues affecting the Sanctuary. The plan recognizes the need for a balanced approach reflecting the existing protection priorities and the multiple use character of the area. Implementation of this plan will require cooperation and coordination among many federal,

state and local government agencies as well as private organizations and individuals. See Appendix 2 for a listing and brief description of the various state and federal management authorities which have statutory responsibility for protecting marine resources in the proposed Monterey Bay National Marine Sanctuary area. Information exchange, sharing facilities and staff, and the coordination of policies and procedures for resource protection will be features of all programs, including research and education. The plan is designed to guide management of the proposed MBNMS for the first five years after implementation. During this period, management initiatives will generally fall into four basic programs: Resource Protection, Research, Education and Administration. The remainder of this section describes goals, guidelines and initiatives for each program.

II. Section: Resource Protection

A. Introduction

The proposed designation of Monterey Bay as a National Marine Sanctuary focuses attention on the value of the area's resources. To ensure that these resources are protected, the Sanctuary resource protection program includes: (1) statement of Sanctuary resource protection goals; (2) promulgation of Sanctuary regulations, including procedures for working with existing regulatory authorities in cases of overlapping jurisdiction; (3) contingency planning and emergency response; (4) encouraging compatible use of the Sanctuary; and (5) surveillance and enforcement, including coordination of policies and procedures among the agencies sharing responsibility for resource protection and enforcement of Sanctuary regulations in addition to those already in place.

B. Goals

The highest priority management goal for the MBNMS is the protection of its marine environment, resources and qualities. Many of the activities that affect the MBNMS marine environment are presently governed by existing State and Federal regulations under the jurisdiction of many different agencies. When this occurs, a National Marine Sanctuary may serve the function of coordinating the activities of these management and regulatory agencies by specifically taking steps to:

- Coordinate policies and procedures among the agencies sharing responsibility for protection and management of resources;
- Encourage participation by interested agencies and organizations in the development of procedures to address specific management concerns (e.g., monitoring and emergency-response programs);
- Develop an effective and coordinated program for the enforcement of Sanctuary regulations;
- Enforce Sanctuary regulations in addition to other regulations already in place;
- Promote public awareness of, and voluntary compliance with, Sanctuary regulations and objectives, through education and interpretive programs stressing resource sensitivity and wise use;
- Ensure that the water quality of Monterey Bay is maintained at a level consonant with Sanctuary designation;
- Establish memoranda of agreement and other mechanisms for coordination among all the agencies participating in Sanctuary management;
- Ensure that the appropriate management agency incorporates research results and scientific data into effective resource protection strategies;
- Reduce threats to Sanctuary resources.

C. Sanctuary Regulations

A summary of the existing regulatory regime in the area of the proposed MBNMS and the proposed Sanctuary regulations are included in Part III of the EIS. The proposed Designation Document (Appendix B) describes the relationship between Sanctuary designation and other regulatory programs. The proposed Designation Document also includes a list of activities subject to regulation now or in the future.

To ensure protection of Sanctuary resources and conservation of Monterey Bay's valuable habitat, NOAA proposes eight additional regulations governing oil, gas and mineral activities; discharges and deposits (from both within and from outside of the boundaries); historical resources; alteration of or construction on the seabed; marine mammals and seabirds; overflights and "personal water craft". Vessel traffic may be regulated in the future after SRD has consulted with the U.S. Coast Guard regarding threats to Sanctuary resources and qualities from vessel traffic and appropriate means of reducing those threats. Fishing is also included in the scope of regulations. The Pacific Fisheries Management Council would have the first opportunity to draft any regulation affecting fishery activities.

However, any of the prohibited activities other than: (1) exploring for, developing, or producing oil, gas or minerals in the Sanctuary, (2) discharge of primary treated sewage after expiration of permits existing as of the date of designation, (3) sand-mining below mean-high water after expiration of permits existing of the

date of designation, and (4) disposal of dredge material other than at existing sites at current frequencies, magnitudes and quality; could be conducted lawfully if: 1) Necessary for national defense or law enforcement; 2) necessary to respond to an emergency threatening life, property, or the environment; or 3) pursuant to:

(a) a National Marine Sanctuary permit issued under section 944.9; or authorized by a Special Use permit issued under Section 310 of the Act.

(b) a certification by the Director of the Office of Ocean and Coastal Resource Management under section 944.10 of a valid lease, permit, license, or other authorization issued by any Federal authority of competent jurisdiction and in existence on (or conducted pursuant to any valid right of subsistence use or access in existence on) the effective date of this designation, subject to complying with any terms and conditions imposed by the Director as he or she deems necessary to achieve the purposes for which the Sanctuary was designated.

(c) The activity is authorized by a valid lease, permit, license, approval or other authorization issued by any Federal, State, or local authority of competent jurisdiction after the effective date of Sanctuary designation, provided that the Director or designee was notified of the application in accordance with the requirements of section 944.11, the applicant complies with the requirements of section 944.11, the Director or designee notifies the applicant and authorizing agency that he or she does not object to issuance of the authorization, and the applicant complies with

any terms and conditions the Director or designee deems necessary to protect Sanctuary resources and qualities.

The prohibitions would apply to United States-flag vessels, persons who are citizens, nationals or resident aliens of the United States, and to foreign-flag vessels and persons not citizens, nationals, or resident aliens of the United States 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.

1. Emergencies

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 activity, including those not listed in the scope of regulations, is subject to immediate temporary regulation, including prohibition, in accordance with the Administrative Procedure Act.

2. Defense or Law Enforcement Activities

The Sanctuary prohibitions, except for the prohibition on oil, gas and mineral activities, do not apply to activities being carried out by the Department of Defense as of the effective date of Sanctuary designation. Nonetheless, all activities carried out by the Department of Defense shall be carried out so as to minimize any adverse impact on Sanctuary resources and qualities. The exemption from prohibitions of additional activities having the

potential for significant impacts carried out by the Department of Defense shall be determined in consultation between the Director or designee and the Department of Defense. If it is determined that an activity may be carried out, such consultation shall include a determination of how it shall be carried out so as to minimize any adverse impact on Sanctuary resources and qualities.

In the event of threatened or actual destruction of, loss of, or injury to a Sanctuary resource or quality resulting from an untoward incident, including but not limited to spill and groundings, caused by a component of the Department of Defense, the cognizant component will promptly coordinate with the Director or designee for the purpose of taking appropriate actions to respond to and mitigate the harm and, if possible, restore or replace the Sanctuary resource or quality.

D. Contingency Plans

The resources of the MBNMS are susceptible to natural and human-related changes. Many of these changes are gradual and can be detected only through long-term monitoring of environmental and biological indicators. However, certain sudden and catastrophic changes in conditions (due to an accidental oil spill or vessel grounding, for example) could seriously impact resources and present severe health and safety hazards.

1. Existing Capabilities

A number of Contingency Plans are presently in effect in the Monterey Bay area. Under the National Contingency Plan for the removal of oil and hazardous substances in coastal and marine areas of EPA's Region IX (California, Nevada and Arizona), remedial action to control or remove this type of material that could endanger the public health is the responsibility of U.S. Coast Guard (USCG) directed Regional Response Teams acting through an On-Scene Coordinator and a Regional Response Center. The USCG's hazardous materials mission under the Oil and Hazardous Substance Pollution Contingency Plan is to: (1) prevent spills, (2) investigate spills that may occur and (3) coordinate response between all responsible parties.

The Eleventh Coast Guard District, based in San Francisco, will provide Regional Response Center facilities. The On-Scene Coordinator will receive scientific support from NOAA and assistance as necessary from the Regional Response Team and other

appropriate Federal and state agencies.

Assistance is also possible from private groups and industry. All of the relevant public and private agencies that would assist in a clean-up have Oil Spill Contingency Plans on file in the USCG Monterey Bay Office which are required to undergo periodic updates and approval by the USCG (LTJG Ray Perry, Personal Communication, April 5, 1989).

The Moss Landing Power Plant and Marine Terminal has an Oil Spill Contingency Plan that was most recently updated in November, 1988. Tankers that unload at the Moss Landing terminal carry an average of one hundred and fifty thousand (150,000) barrels of oil. A boat, contracted by PG&E, equipped with portable skimmers, containment booms and other spill cleanup equipment is with the tanker during unloading. Two more boats are stationed at the plant docks, similarly equipped, but without crews. However, some Moss Landing PG&E employees are trained to operate the boats and equipment and are available on an "on-call" basis. The USCG can respond within 15 minutes and provide the necessary additional personnel, boats and equipment from the Monterey Coast Guard Station, if necessary (Carl Walker personal communication after discussion with Dan Bishop, May 4, 1989), although it will take longer for the USCG to also bring the necessary equipment.

Recently a group of local boat operators including, fishermen and researchers have organized themselves to begin determining their capabilities during an ocean emergency. The group, the Professional Mariners Response Organization, intends to conduct a

small-scale emergency response drill using only a few boats (5) during October 1991 to determine the effectiveness of their equipment and the best means of providing assistance during a real emergency response (Lee Bradford, pers. comm. June, 1991).

The U.S. Navy has a Contingency Planning Guide (Draft, 1987) that details the oil spill response equipment, operating personnel and spill response specialists that are available from the Supervisor of Salvage of the Naval Sea Systems Command for major spill response efforts. The Navy oil spill plans outline responsibility for all Navy spills such as those emanating from damaged Navy Fleet oilers or from Military Sealift Command chartered tankers.

In addition a number of oil companies and organizations including, Exxon Company (April, 1980), Cities Service Oil and Gas Corporation (Draft April, 1986; revised, 1988), Atlantic Richfield Company (April, 1981) and the Western Oil and Gas Association (January, 1987), have Oil Spill Contingency Plans or Documents that are designed to provide information and logistical support to the responsible government agency, discharger and other interested agencies in the event of a spill.

Finally, Clean Bay and Clean Seas are two industry-supported oil spill clean-up cooperatives operating in the San Francisco Bay and the Santa Barbara areas, respectively. The primary responsibility to develop oil spill prevention control techniques rests with management of each member company. However, the services, equipment and personnel of each cooperative are available

to member, non-member and government agencies in each area of interest. The dividing line between the two cooperative areas of operations is at Cape San Martin. Therefore the resources of Clean Bay would be most relevant for oil spills in the Monterey Bay area although mutual assistance is available from each other's region.

Clean Bay consists of 17 members including 6 oil refineries. The cooperative would have a 4 hour response time to Moss Landing, and 8 to 10 hours with the vessels located in Richmond. Within 6 to 7 hours Clean Bay could mobilize a plane located in Oakland and spray dispersants on the spill from the air. This type of dispersant action needs approval from the Coast Guard (Rick Willett, personal communication, May 18, 1989).

Recent State (SB 2040) and Federal legislation (Oil Pollution Act) specifically address numerous additional response, as well as preventative, measures regarding vessel oil spills (see Appendix C for details regarding this legislation).

2. Sanctuary Action

Overall the Monterey Bay USCG and the PG&E response capabilities only seem adequate for immediate response and for minor to moderate events. Based on their recent involvement in the Exxon Valdez spill, staff from the Monterey Bay Aquarium have concluded that the current Monterey Bay contingency plan for oil spill removal and wildlife recovery is inadequate (Julie Packard, personal communication, May 1, 1989).

One of the first management actions of the Sanctuary will be

to run an emergency response exercise for an oil spill in the Sanctuary boundaries. The intent of this exercise will be not only to test the adequacy of existing plans and the availability and effectiveness of the equipment allocated but also to provide an opportunity for existing emergency response agencies and personnel to work with the Sanctuary and to define each others roles and responsibilities.

A Marine Safety Office Contingency Plan is currently under review at the Coast Guard station in Monterey Bay. It is designed to incorporate and coordinate the above plans, resources and equipment in the event of a spill in the Monterey Bay region. Sanctuary personnel will work with the USCG during the preparation of this plan to identify those areas where the Sanctuary can assist and supplement necessary actions as well as take the lead in areas of Sanctuary expertise.

The Sanctuary program is preparing a National Plan with additional site specific plans, such as for Monterey Bay, that will recognize the need for ongoing training and importance of appropriate equipment on hand in the event of a large-scale emergency that will require long-term response and clean-up capabilities.

To provide further protection to Monterey Bay resources, the Sanctuary staff will assess the state of preparedness of the relevant parts of the contingency plans as they relate to the Sanctuary. This action will entail exchanging information with government and industry response teams and seeking their support in

assessing detection and clean-up capabilities that can be used to protect Bay resources and a possible trial simulation in Monterey Bay. In addition, and consistent with the National Marine Sanctuary Program Regulations (15 CFR Part 922), NOAA will provide the necessary resources and impetus to develop and implement a site-specific contingency and emergency-response plan designed to protect the Monterey Bay Sanctuary's resources. The plan shall contain alert procedures and actions to be taken in the event of an emergency such as a shipwreck or an oil spill. The plan will specify the role of the Sanctuary and with which action items it has lead responsibility versus providing assistance when requested by another lead agency.

An SRD-level contingency and emergency-response plan has been prepared for the Channel Islands and Key Largo National Marine Sanctuaries. A similar plan for the proposed MBNMS will be created that will:

- Describe emergency-response procedures and coordination requirements for SRD and Sanctuary staff;
- Provide a geographic information system depicting resources at risk;
- Outline procedures for emergency research; and
- Provide damage assessment guidelines.

In conjunction with this plan, agreements may be formulated to improve spill detection programs and augment containment capabilities (i.e., with additional equipment, staff, and deployment plans). These efforts will be closely coordinated with similar efforts to protect the Elkhorn Slough NERR.

E. Compatible Use of the Sanctuary

Encouraging the private and public uses of the Sanctuary, not prohibited pursuant to other authorities, in ways that are compatible with the primary objective of resource protection, is an important aspect of the resource program. Thus the Sanctuary will:

1. Encourage the public who use the Sanctuary to respect sensitive Sanctuary resources and qualities.
2. Provide relevant information about Sanctuary regulations and use policies;
3. Collaborate with public and private organizations in promoting compatible use of the Sanctuary; and
4. Monitor and assess the levels of use to identify and control potential degradation of resources and minimize potential user conflicts.
5. Monitor commercial and recreational activities in the Sanctuary and encourage other agencies to do so to detect areas of particular management concern;
6. Collect and publicize information on commercial and recreational activities in the Sanctuary;
7. Consulting with other agencies on policies and proposals for the management of activities which may affect protection of Sanctuary resources; and
8. Developing educational materials aimed at enhancing public awareness of the Sanctuary's resources and their need for protection.

Monitoring and information exchange programs are discussed under research (Section III). The development of materials is discussed under education (Section IV).

F. Surveillance and Enforcement

1. Sanctuary Action and Coordination with Existing Agencies

A primary feature of the resource protection program is the surveillance of Sanctuary waters and enforcement of applicable regulations. Although a detailed enforcement plan has not been developed, NOAA, at present, envisions a State-Federal cooperative enforcement system involving the State of California Resources Agency, the U.S. Coast Guard, the U.S. Fish and Wildlife Service, the National Marine Fisheries Service and the National Park Service.

Since the proposed Sanctuary would include both State and Federal waters, close coordination between State and Federal authorities would be required. To achieve this objective the Sanctuary envisions a cooperative agreement where Federal Sanctuary officers are deputized to enforce existing State regulations and State enforcement officers are deputized to enforce Sanctuary regulations. All officers would report directly to the Sanctuary manager and work full-time on Sanctuary management issues. This mutual deputization would foster a close working relationship between the State and the Sanctuary as well as assist in increasing mutual goals of enhanced resource protection.

Boats for both State and Federal officers would be made available by the Sanctuary to patrol the Sanctuary for not only education and enforcement purposes but also to increase the visibility of the Sanctuary and the public's awareness of the

Sanctuary's presence.

A radio transmitter would be established from the local Sanctuary headquarters using a 100 Watt VHF transmitter to create coordinated network of enforcement personnel to assist with rapid response to diving or boating accidents or an oil spill response. Due to the geographic limits on the range of the transmitter to boats (30 mile max.) and from boat-to-boat (15 mile max.) and the large size of the proposed Sanctuary, repeaters would have to be established on towers along the coast to enable long-range communication. A dedicated frequency for Sanctuary operations would be made available using using the existing dedicated frequency bands for government use.

The Sanctuary also intends to take advantage on either a regular basis or on an ad hoc basis, depending on availability, of NOAA aircraft that fly over the Sanctuary area that could provide additional assistance during enforcement actions or emergency responses. Aerial surveys could also be arranged for research purposes as well as assist in concentrating on-water actions to specific locations.

The USCG has broad responsibility for enforcing all Federal laws in navigable waters under U.S. jurisdiction. Where these laws regulate fishing harvests, the USCG works closely with the NMFS and the CDF&G. The CDF&G enforces Federal as well as California fishing regulations in the exclusive economic zone (200 miles from the State's coastal baseline) and acts as the primary agency for the enforcement of fishery regulations applying to Monterey Bay.

Sanctuary designation would have the effect of broadening USCG enforcement responsibilities to include the enforcement of Sanctuary regulations. Neither NOAA nor the USCG has the resources to conduct systematic surveillance and enforcement operations to ensure compliance with Sanctuary regulations. However, both the USCG and the State conduct operations in the area. The USCG would provide limited surveillance in conjunction with multi-mission, surface or aerial operations.

NOAA plans to rely on such observers from other agencies and cooperating organizations, including excursion and service boat operators, to assist in providing the surveillance information needed for the enforcement program. The enforcement program is expected to be sufficiently strong to deter widespread violation of Sanctuary regulations. However, in the event that analyses of use patterns after Sanctuary designation indicate that additional surveillance is required, NOAA will provide for more intensive enforcement to protect Sanctuary resources. The effectiveness of Sanctuary enforcement operations will be evaluated two years after Sanctuary designation and annually thereafter.

Emphasis will also be placed on information development and dissemination as well as after-the-fact enforcement efforts. The interpretation and education program will therefore be important in engendering voluntary compliance with Sanctuary regulations.

2. Public Education and Information

Because the most effective enforcement is prevention, the

Sanctuary education program will make every effort to inform users of the need to use the Sanctuary environment wisely. The focus of the first year of the education program will be to inform the public about the existence of the Sanctuary, its purpose and intent, its areal coverage and the National significance of its resources and qualities. Much of this effort will involve the preparation of easily understood brochures and other written materials on regulations, and the reasons for them. These materials will be made available to all Sanctuary users.

3. Planning and Coordination

Information obtained from the research program and from surveillance-enforcement activities on Sanctuary visitor use patterns, frequently occurring violations, and potentially sensitive resources, will be reviewed in periodic meetings between the Sanctuary Manager, the Sanctuary Advisory Committee and enforcement agency personnel to determine the adequacy of surveillance levels.

III. Section: Research

A. Introduction

Specific sites within the study area have a long history of research and a considerable amount of baseline environmental information has been documented. These are historical research areas of national significance. Año Nuevo Island and Año Nuevo Point have been intensively studied as has the rocky intertidal area along the northern shoreline of the Monterey Peninsula (Hopkins Marine Life Refuge and Pacific Grove Marine Gardens Fish Refuge). The Monterey Canyon and the Bay environment have been the focus of research as well.

Thirteen marine research/education institutions are found in the study area, eleven of which are in the proposed Sanctuary boundaries. The eleven encompassed by the boundaries are the Año Nuevo State Reserve; State University of California's Institute of Marine Sciences at Long Marine Laboratory at Santa Cruz; Elkhorn Slough National Estuarine Research Reserve, (NOAA and CDF&G); San Jose State University's Moss Landing Marine Laboratories; Stanford University's, Hopkins Marine Station; the Center for Ocean Analysis and Prediction (NOAA); the Naval Postgraduate Marine Laboratory; Pt. Lobos Ecological Reserve; Granite Canyon Marine Laboratory (CDF&G); the Monterey Bay Aquarium's research division; and the Monterey Bay Aquarium Research Institute (Incorporated May, 1987). The University of California's Landels-Hill Big Creek Reserve in Big Sur and the FWS research station at Pt. Piedras Blancas, are both south of, and thus excluded from, the preferred boundary.

The opportunities for undertaking marine research in the area are excellent. The diversity of habitat types and communities is outstanding and past studies provide important baseline information. The Monterey Canyon provides a unique opportunity to undertake deep water marine research without having to undertake long and expensive cruises offshore. Finally, the marine research institutions within the area provide an exceptional resource to draw upon in furthering our understanding and thus the management of the proposed Sanctuary's marine resources.

Effective management of the MBNMS will require the inauguration of a research program that effectively coordinates the existing research programs and addresses management issues. COAP/NOAA in Monterey has already made significant progress in supporting research efforts in the area and in disseminating information from numerous data sources. A growing education program at COAP is also able to inform the general public and user groups of Monterey Bay about the relevance of the data to their day-to-day activities as well as increase their awareness of the significance of the bay's resources and qualities.

Specific applied research needs would include geophysical seismic OCS research, fisheries management issues, coastal land-use planning, environmental toxicology, water and solid waste studies all focused on the resources and qualities of the Sanctuary.

The role of the Sanctuary can serve to provide a forum for discussion of research priorities and exchange of information among local research institutions. The Sanctuary can also provide

limited but long term logistical and financial support for research studies consistent with the goals of the Sanctuary program.

Specific priority research needs for the Sanctuary will be identified and approved by SRD with advice from the Sanctuary Advisory Committee. This process is described in the following Sections.

Scientific investigations into the Monterey Bay ecosystem structure and function is essential so that managers can develop effective solutions to management problems. Research funded by the SRD will be directed to improving our knowledge of the Sanctuary's environment and resources. This research will not only expand our understanding of basic coastal and marine processes but will be the basis for evaluating activities that may affect the Sanctuary's resources. The general direction of the research program and the process for preparing an annual Sanctuary Research Plan is discussed below.

B. Goals

The purpose of Sanctuary research activities is to improve understanding of the Monterey Bay environment, resources and qualities, to resolve specific management problems, and to coordinate and facilitate information flow between the various research institutions, agencies and organizations. A major emphasis of the research program will be to encourage studies that investigate the natural processes at the land-sea interface. For example, studies that integrate the facilities of the Elkhorn

Slough National Estuarine Research Reserve with deep sea and/or coastal research will help increase our understanding of the role of estuaries in coastal productivity. Research results will be used in education programs for visitors and others interested in the Sanctuary, as well as for resource protection. The strategies to be employed in the research program are to:

- ° Establish a framework and procedures for administering research to ensure that research projects are responsive to management concerns and that results contribute to improved management of the Sanctuary;
- ° Incorporate research results into the interpretive/education program in a format useful for the general public;
- ° Focus and coordinate data collection efforts on the physical, chemical, geological and biological oceanography of the Sanctuary;
- ° Encourage studies that integrate research from the variety of coastal habitats with nearshore and open ocean processes;
- ° Initiate a monitoring program to assess environmental changes as they occur due to natural and human processes;
- ° Identify the range of effects on the environment that would result from predicted changes in human activity or natural phenomena;
- ° Encourage information exchange among all the organizations and agencies undertaking management-related research in the Sanctuary to promote more informed management.
- ° Evaluate the effectiveness and efficiency of the research program and its integration with resource protection and education objectives.

C. Framework for Research

The research program consists of three major project categories:

- ° Baseline studies to determine the features and processes of the natural environment; to determine the abundance, distribution, and interaction of the living resources; distribution and status of cultural resources and to describe the pattern of human activity in the Sanctuary from prehistoric times to the future;

- Monitoring to document changes in environmental quality, in ecology, and in human activity; and
- Predictive studies to assess the causes and effects of environmental and ecological changes.

Each of these categories is described in more detail below:

1. Baseline Studies

Baseline studies will be designed to obtain a better understanding of the physical oceanography and ecology of the Sanctuary. Because Monterey Bay is located in an area subject to hydrocarbon spills and discharge effluents, Sanctuary managers need sound information on water circulation. This information would be used to improve understanding of the dispersion pattern of possible oil spills and current land-source and ocean-source discharges into the Sanctuary as part of the Sanctuary's contingency planning efforts. A basic understanding of the physical oceanographic processes of the Monterey Bay area at a mesocosm scale is essential before one can undertake predictive studies of human activities on the marine environment.

Studies into the transport of discharges and materials from sources to sinks throughout the water column are necessary before one can conclusively establish cause and effects of these anthropogenic inputs. It is hoped that ultimately this research will establish a firm scientific basis from which to apply management and possible regulatory measures that will reduce the impacts and costs of these human activities on the environment and society.

Basic physical oceanographic studies should focus on interchange of water masses between Bay and open ocean, local circulation within the Bay, and upwelling processes. To accomplish the goal of understanding regional circulation the Sanctuary could assist with the development and dissemination of information from existing monitoring stations such as NOAA tide gauges, current meters, thermistor chains and satellites such as the NOAA polar orbiting satellites with the Advanced Very High Resolution Radiometer instrument which can image sea surface temperature. Process oriented studies can use resident, indicator species to identify local water mass movement and elucidate key productivity areas or areas of high diversity. Results could then be incorporated into an understanding of food chain relationships and predator-prey foraging dynamics.

Such studies could then be expanded upon to determine whether effects on the resources of the Monterey Bay area are caused by biological impacts, i.e., inter- or intraspecific competition or predation such as between salmon, seabirds, shorebirds and marine mammals, or from abiotic effects such as sea temperature rise from El Niño events or from human activities such as degradation of water quality via pollutants. For example, a fishery stock assessment could be instituted to determine the species composition and abundance of the fish population of Monterey Bay. The data collected in this study would serve to document the Bay's value as a fishery habitat and provide the basis for estimating the effects, if any, of increased fishing intensity, climatic change,

fluctuations in predator and prey abundance, or pollutants on the fishery.

Comprehensive knowledge of the distribution of organisms and their dependence on environmental factors is needed for interpretation as well as for resource protection. The environment at representative depths and locations should be characterized by the collection of additional baseline data on water temperature and salinity, light penetration, upwelling circulation and nutrient-load. This information should be correlated with data on the abundance and distribution, by depth zone and location of species populations living within and transiting the Monterey Bay area. Data of this type have been collected by the numerous research institutions surrounding Monterey Bay, but there are still many gaps in our knowledge of Monterey Bay ecology, specifically land-sea interactions.

The interaction of physical oceanography with biological studies will assist in developing an understanding of the ecology of the region and the general health and productivity of the Bay area. The research and education programs in general will emphasize a multi-disciplinary, multi-institutional, integrative approach that will engender a regional and cooperative attitude to basic and applied scientific issues. The geographic location of the proposed Sanctuary provides an excellent opportunity to integrate research that investigates the effects of man's land activities on the resources and human uses of the marine environment. The data collected from these studies would serve to

document the Bay's value as a productive ecosystem and focus for public recreation and provide the basis for estimating the effects, if any, of present and future land-use practices on the Bay's resources.

Additionally, an historical context study, including a general literature search, will be conducted to identify probable historical, archeological and paleontological sites within the Sanctuary. This research will be followed by a field reconnaissance-type remote sensing survey and archeological assessment to locate and evaluate the extent to which historical and cultural resources are based in the Sanctuary. These baseline cultural and historical resource studies will provide the fundamental information necessary for developing a cultural and historical resource management strategy and education/interpretation program for the Sanctuary.

The recently constructed Stanton Center will provide a new maritime museum and history center in Monterey. It will provide separate exhibit areas, a workshop for ship building and restoration and a research library. Coordination with this institution will enhance the public's awareness as well as the efforts of the Sanctuary to protect and research important historical and cultural resources.

2. Monitoring

Effective management requires a data base more comprehensive than simply the number of plants, animals, and geologic, physical

and chemical elements within the Sanctuary. It requires an understanding of long-term changes to the status of the resources and their environment. Monitoring provides such understanding. Monitoring data indicative of the relative health of resources can be used to detect ecological changes and trends. This program should include pollution monitoring studies and studies to monitor the population dynamics of species inhabiting the benthos and water column of Monterey Bay's intertidal zone, canyons and continental shelf. Changes in the relative distribution of these species could indicate the existence of natural or man-caused threats to Bay resources. A three-phase monitoring program has been initiated at the neighboring Elkhorn Slough National Estuarine Research Reserve. This program can be coordinated and developed in concert with a program suitable for the Monterey Bay National Marine Sanctuary.

The resources of Monterey Bay are exposed to many different types of threats. Research and monitoring needs could be ranked according to the perceived magnitude of the threat. Among the threats to the Bay resources are: oil and gas activities as well as discharges from the land and ocean including point source (sewage treatment plants, combined sewer overflows, etc.) and non-point source (agriculture, marinas, urban runoff, etc.) pollutants. Pollutant loading into the Sanctuary can occur indirectly via land runoff from rivers or the atmosphere and directly from man's activities such as ocean dumping, outfall pipes or vessel discharges.

Many activities and phenomena in the Bay warrant long-term

investigation and monitoring. For example studies could be implemented to monitor the effects of (1) commercial vessel traffic in the area; (2) recreational activities, such as the use of jet-skis, hovercraft, and small power boats (thrill craft); (3) changes in the abundance and proportions of adult to juvenile invertebrates and fish larvae; (4) fluctuations in the abundance of whale, pinniped and seabird species in the Sanctuary; (5) the intensity and relative importance of sport fishing, commercial fishing and nature observation activity; (6) biological input of organics and fecal coliforms from pinnipeds at Año Nuevo; (7) effects of natural versus man-induced (i.e., sand mining) erosion and sedimentation; (8) fate of enteric pathogenic bacteria in Monterey Bay and West Coast waters in general; and (9) fishery/mammal interactions, such as the by-catch of sea otters and birds in gill nets, and the competition between sport divers and otters for abalone.

In general the monitoring data needs to be collected and analyzed in a manner so that it is widely applicable and provides timely and pertinent information for academic, management and educational purposes. Status and trends of contaminants in Monterey Bay is presently underway with the NOAA and State Water Resource Control Board Mussel Watch Programs. However, there is a need for before, during and post-hydrocarbon activity monitoring and toxicological assessments. These studies should be directed at all trophic levels of concern including plankton, algae, fisheries, invertebrates, mammals, and birds. Recently a monitoring program has been initiated by Minerals Management Service (MMS) for

hydrocarbon activities in Southern California (MMS, 1988). A similar study should be considered if future Lease Sales are considered in the central California area.

Coastal stations, as well as offshore data buoys maintained by NOAA and MMS, presently measure wind, sea level, temperature, and other air and sea parameters. Data from these sites can be used for research, management, enforcement and rescue programs. However, continuous monitoring and rapid dissemination of information is essential to permit a timely and effective response by personnel to constantly changing environmental conditions and threats.

Overall the monitoring program will assist in our understanding of the general health of the Bay. It could help discover sources of pollutants and assist in the establishment of cause and effects relationships as part of long-term toxicological evaluations. It could also elucidate the changing patterns, and magnitudes of input of contaminants. Finally the monitoring program will carefully address the issue of what to do with the data and how to apply the findings for basic science as well as academic, education and applied management purposes.

3. Predictive Studies

In addition to baseline research and monitoring, the Sanctuary research program will continue studies, as needed, to analyze the causes and consequences of ecosystem changes, and predict their effects on new and more intense human activity in the area. Unlike

the monitoring program these predictive studies are envisioned to be more short-term and directly targeted to an immediate management issue. Studies could be made to determine the effects on marine mammals of possible increases in boating activity if heightened interest in whale watching and fishing excursions results from Sanctuary establishment. A knowledge of these effects would enable management to provide information to Sanctuary users to avoid disturbing these animals unnecessarily.

Other studies of whales, pinnipeds and seabirds in the Sanctuary could be initiated to determine their range, where they come from, and how dependent they are on the food resources of the Bay. These studies should be closely tied into similar studies conducted in the GFNMS and Año Nuevo research programs. One such study, for example, might be an investigation to determine (1) whether the decrease in Steller sea lions in the Farallon and Channel Islands can be attributed to a decline in prey availability and compare the results to a similar study on the relatively stable Stellar sea lion population on Año Nuevo and; (2) the importance of the Monterey Bay fish stocks in sustaining the Steller sea lion population.

Other areas of predicitive studies include the development of adequate circulation models that would be used for pollutant tracking, emergency response procedures, stock management etc. Development of realistic computer models, when updated with direct environmental measurements, could assist directly with all of the managment issues mentioned above.

D. Selection and Management of Research Projects

To ensure that projects considered for funding by the SRD are directed to the resolution of Sanctuary management issues and concerns, the Sanctuary Manager, the SAC and the SRD, will follow procedures developed by the SRD, to ensure that the Sanctuary's research program is consistent with overall Program policies and directions. These procedures include: (1) preparing an annual Sanctuary Research Plan (SRP) and (2) monitoring the progress of research in the Sanctuary. To some degree, the research program for the MBNMS will be coordinated with the research and monitoring program at the Elkhorn Slough National Estuarine Research Reserve.

1. Preparing an Annual Plan

Each year a Sanctuary Research Plan (SRP) will be prepared for the MBNMS. The SRP will then be incorporated into a national plan which includes annual plans for each Sanctuary. SRD is currently preparing the steps involved for the annual planning process and the announcement of requests for proposals.

If research proposals include activities that are prohibited by Sanctuary regulations a permit may be issued by NOAA upon application by researchers or, it may be determined that all or part of the research should be conducted outside of the Sanctuary. Research on specially protected or endangered species, such as the brown pelican and certain marine mammals, may require additional research permits from other agencies.

2. Monitoring Progress

The Sanctuary Manager will monitor the performance of research projects and keep records of all research underway, equipment being used on site, frequency of researchers' visits, and progress to date. SRD funded researchers will be required to submit progress reports and final reports to the SRD and Sanctuary Manager to ensure conformance to schedules outlined under the terms of the contract. Final reports may be reviewed by recognized scientists and resource managers before approval by the SRD. Outstanding project reports will be published by the SRD in its Technical Report Series.

3. Information Exchange

To complement directly funded research, the SRD will encourage research funded from other sources particularly where it supports Sanctuary management objectives. In this regard, the SRD will make available to other agencies and private institutions current Sanctuary resource data obtained from past and ongoing research projects.

IV. Section Education

A. Introduction

Sanctuary designation could provide local governments, businesses, citizen groups, farmers, fishermen, tourists and existing institutions, information and techniques to protect the natural environment of Monterey Bay. Increased public understanding and appreciation of the value of Monterey Bay resources is essential for their protection. The interpretive program for the MBNMS will be focused on improving public awareness of the Sanctuary and providing information on Bay resources and Sanctuary regulations designed to protect them. Such efforts are intended to also encourage voluntary compliance with the Sanctuary as well as other existing regulations designed to protect the Monterey Bay area.

B. Goals

The education program should be directed to improving public awareness and understanding of the significance of the Sanctuary and the need to protect its resources and qualities. The management objectives designed to meet this goal are to:

- Provide the public with information on the Sanctuary and its goals and objectives, with an emphasis on the need to use these resources wisely to ensure their long-term viability;
- Broaden support for the Sanctuary and Sanctuary management by offering programs suited to visitors with a range of diverse interests;
- Provide for public involvement by encouraging feedback on the effectiveness of education programs and collaborate with other organizations to provide interpretive services, including extension and outreach programs and other volunteer projects,

complementary to the Sanctuary program;

- ° Collaboration with Sanctuary management staff in extension and outreach programs, and participation in other volunteer programs;
- ° Incorporate research results into the interpretive/education program in a format useful for the general public; and
- ° Create public awareness of the entire Nation-wide Sanctuary Program, its purposes and intent and the role of the Monterey Bay NMS as part of a larger system.

C. Educational Opportunities

Opportunities for interpreting the MBNMS fall into two broad categories: 1) education for local visitors and potential users of the Sanctuary, including; school groups and teachers, fishermen, boaters, divers, etc., as well as education for visitors at local information centers and at the Sanctuary headquarters; and 2) interested groups not visiting either location but who desire to learn more about the Sanctuary's resources and qualities. Below is a description of the educational programs that the Sanctuary will develop to maximize these opportunities.

For example, the diversity of habitats and communities, the unique Monterey Canyon, and the overlap of human uses of the resources such as fisheries present unique opportunities for education. There are many potential vehicles for education including the highway pulloffs, existing State park, beach, refuge and reserve programs, community colleges, university extension programs, and boat tours. The large numbers of visitors to the area (for example, 1 - 2 million yearly on the Big Sur coastal highway) is a potential "market" for educational information in

addition to local residents and agencies.

The Monterey Bay Aquarium in Monterey, the Año Nuevo facilities, and the Elkhorn Slough NERR, as well as other State and private educational facilities such as Point Lobos, Point Lobos Natural History Association, Big Sur, and university programs add an exciting, existing dimension to interpretation of the proposed Sanctuary area, and present a great opportunity for presentation of information on the proposed Sanctuary program.

As well as established facilities there are a number of locations throughout the Sanctuary's coastal area that present additional opportunities for educational and interpretive services for visitors to the area. For example the Pigeon Point Lighthouse, Davenport, Wilder Ranch, Pt. Santa Cruz and New Brighton/Seacliff Pier already provide education opportunities on a variety of cultural, historical and fishing subject areas. Waddell Creek, Moss Landing State Beaches, Carmel/Stillwater and the Pt. Sur Lighthouse are all excellent recreational sites for windsurfing, sportdiving, whalewatching, surfing and sportfishing. Big Basin, Natural Bridges State Park, New Brighton Beach, Moss Landing State Beach, Salinas River National Refuge, Asilomar and the area between Lover's Point to Pebble Beach are areas of easy public access for nature viewing and intertidal, coastal and estuarine ecology education. Finally, Santa Cruz Pier and Harbor, Capitola Wharf, Manresa/Sunset Beach, Moss Landing Harbor, Marina, Monterey Harbor and Piers, Coast Guard Breakwater and Carmel Beach are all excellent locations to establish signs and displays. These

educational displays would provide visitors, residents and users of the Sanctuary with a brief description of the Sanctuary's resources and uses. The signs could also outline the objectives and goals of the National Marine Sanctuary Program and specifically educate the public regarding the Monterey Bay National Marine Sanctuary regulations.

D. Educational Programs

Education for the MBNMS will consist of three distinct sub-programs:

- Site visitor programs and information for regular users such as fishing and whale watching excursions, other recreational visitors to Sanctuary waters and local public and school groups;
- Information center programs for those visiting the facilities at the MBNMS headquarters and other nearby information centers; and
- Outreach programs for interested groups not visiting the Sanctuary.

It should be noted again, however, that many of these programs will be carried out in coordination with programs already sponsored by existing interpretative programs.

1. Site Visitor Programs

Whale watching and other nature viewing at Monterey Bay is generally incidental to sport fishing from excursion boats, but there is a potential for excursions solely for the purpose of nature viewing. Nature enthusiasts visiting Monterey Bay have the opportunity to enjoy watching sea lions, harbor seals, sea otters,

porpoises and Grey whales as well as the large flocks of seabirds that feed in Bay waters. Brochures and educational materials will be made available to fishermen and nature viewers to make them aware of Sanctuary regulations, particularly with regard to waste disposal, and to inform them about the seabirds and marine mammals that may be seen in the Sanctuary and the rich ecological communities lying beneath its waters.

On-site education provided by the MBNMS manager will consist largely of written material describing the Sanctuary and explaining its regulations. This information will be available to the wide variety of recreational users and tourists who visit the area. The program will actively coordinate with existing educational programs. If there is sufficient public interest and if funding and staff resources are available for expanding this program, the Sanctuary Manager will consider co-sponsoring special excursions to Monterey Bay waters, organized by non-profit organizations, and providing on-board interpreters.

2. Information Center Programs

The establishment of a Sanctuary headquarters in the area and the existence of other visitor and information centers along the coast provide an opportunity to inform visitors to these sites about the Monterey Bay environment. Many of these visitors would not normally visit Monterey Bay; yet, given the opportunity to see educational exhibits and brochures about the Sanctuary at these centers, their appreciation for the special qualities of the Bay

environment should be enhanced. The feasibility of establishing additional distribution points for brochures and information and space for posters and displays will be investigated.

There are geographically distributed educational/interpretive programs that present a range of opportunities for users to gain an appreciation of the marine environment. To a large extent these programs are not coordinated.

Año Nuevo State Reserve: The University of California, Santa Cruz, has a visiting schools program, and its The Environmental Studies Internship Program is involved in the Año Nuevo docent program which trains guides. CDP&R has a popular program providing guided walks to observe the pinnipeds and all other aspects of the natural history of the reserve. Emphasis is on the growth of the elephant seal population, and pinniped ecology. An improved visitor center is being planned and the area attracts approximately 140,000 visitors/year.

California Sea Otter Game Refuge (Central Coast of California): At present the Refuge does not have an educational program dedicated to the California Sea Otter.

California State Park System: The State parks, beaches, historical parks and reserves offer public access to the shoreline throughout most of the study area. Access is only difficult along the Big Sur shoreline. There are only a limited number of educational programs considering the rich marine resources.

Carmel Bay Ecological Reserve: This area is used by researchers, sport-fishermen and sport divers.

Elkhorn Slough National Estuarine Research Reserve: On-site management provided by CDF&G which shares overall management responsibility with NOAA (Sanctuaries and Reserves Division). The site and visitor center provide visitors with numerous marine and estuarine interpretive exhibits. Docent guided tours of the site are available year-round and the Elkhorn Slough Foundation facilitates the use of the site as an outdoor research laboratory as part of the National Estuarine Research Reserve System.

Hopkins Marine Life Refuge (Pacific Grove): This area is primarily used by researchers.

Long Marine Laboratories Aquarium and Museum (Santa Cruz): Presents program and docent led tours of research facilities.

Monterey Bay Aquarium: Presents programs dealing with all facets of the proposed Sanctuary environment. The goal of the aquarium is to "stimulate interest, increase knowledge and promote stewardship of Monterey Bay and the world's ocean environment through innovative exhibits, public education and scientific research".

Based on the theme of habitats of Monterey Bay, the Aquarium exhibit program offers visitors a first-hand look into the world of these diverse undersea communities. On-site school, outreach and teacher education programs provide information to approximately 100,000 school children and 1,300 teachers per year.

Moss Landing Marine Laboratories: Holds an open house each year to present ongoing research. In addition, programs are offered to school groups.

Natural History Museum in Santa Cruz: Provides visitors with

information on the marine environment. The Environmental Studies Internship Program at UCSC provides coordination of many of the site's programs.

Natural Bridges State Park: Provides tide pool tours to school groups.

Pacific Grove Marine Gardens Fish Refuge: Primarily used for recreation, especially diving.

Pacific Grove Natural History Museum: Provides visitors with information on the marine environment.

Point Lobos State Reserve: A small educational program is conducted and some guided walks are available. School groups are encouraged to visit Asilomar State Beach rather than Point Lobos.

Santa Cruz Port District: Provides interpretive educational programs with approximately 50 tours/year and programs are to be expanded.

3. Outreach Programs

Finally, the MBNMS educational program will try to reach groups in the coastal region of California and elsewhere who have an interest in Monterey Bay and related areas, but are not apt to visit the area. This project entails identifying these groups and making educational materials and presentations available to them.

These programs will be carried out in conjunction with similar local programs to provide off-site education. Where possible, they will involve close cooperation with environmental study groups such as the Sierra Club, Center for Marine Conservation, Amercian

Cetacean Society (National and the Monterey Bay Chapter), Audubon Society, Friends of the Sea Otter, and the Whale Center; research and education organizations, such as the California Academy of Sciences, the University of California and the Pescadero Marsh Natural Reserve; local officials in Monterey, Santa Cruz and San Mateo counties; the State Sea Grant Program and the Association of Monterey Bay Governments (AMBAG) and representatives of the tourism and recreational and commercial fishing industries. These groups will be provided with educational materials on the Sanctuary and will be encouraged to inform others of the availability of these materials. If interest is strong enough, a slide presentation or mobile exhibit may be developed for the use of schools and private groups.

V. Section: Administration

A. Introduction

This section of the management plan describes the administrative roles of the agencies that will be involved in Sanctuary management, proposes strategies to coordinate their activities, and provides for periodic evaluation of the effectiveness of the management plan. Sanctuary management consists of four functions: resource protection, research, education, and administration. Administration oversees all other functions and establishes who is responsible for implementing specific programs. The administrative framework ensures that all management activities are coordinated.

The SRD is responsible for the overall management of the proposed MBNMS. The SRD will coordinate its on-site activities through cooperative agreements with the State, regional, local and other Federal agencies. The general administrative role of each agency is as follows.

1. Sanctuaries and Reserves Division

The National Marine Sanctuary Program is managed by the SRD. A site-specific management plan is prepared for each Sanctuary to ensure that on-site activities in resource protection, research, and education are coordinated and consistent with Sanctuary goals and objectives.

The SRD develops a general budget, setting out expenditures for program development, operating costs, and staffing. Funding

priorities will be reviewed and adjusted annually to reflect evolving conditions in the proposed MBNMS and National Marine Sanctuary Program priorities and requirements. The SRD also establishes policies and procedures in response to specific issues in each Sanctuary. Detailed SRD responsibilities are listed under the resource protection, research, education, and general administration sections which follow.

The Sanctuary Manager for the MBNMS reports directly to the SRD. In this capacity, the Manager represents the SRD and is the primary spokesperson for the MBNMS. The Sanctuary's headquarters will be located in the Monterey Bay region. The Manager will serve on the Elkhorn Slough National Estuarine Research Reserve Advisory Committee, assuming the role formerly filled by the Gulf of the Farallones NMS Manager.

2. Sanctuary Advisory Committee

The National Marine Sanctuary Program is different from other special area management programs because Sanctuaries are to be managed for research and education as well as for resource protection. In addition, several agencies and interest groups are involved with the Sanctuary's management. Accordingly, a mechanism to assist the interested groups in participating in Sanctuary management will be developed. The Sanctuary Advisory Committee (SAC) will be established to provide this management function.

The Sanctuaries and Reserves Division will determine the structure, composition and functions of the SAC in accordance with

the procedures specified by the Federal Advisory Committee Act (FACA) (Appendix A).

All interested groups and agencies will be consulted to ensure that the SAC takes all interests into account and that the committee is representative of a broad based constituency to ensure that the Manager has a broad information base upon which to make any management decisions. The experience and expertise of the SAC will be available to the Manager on an ad hoc basis as well as during regularly scheduled meetings. In order to function efficiently in an advisory capacity it may be beneficial to subdivide the SAC into subcommittees that correspond to the resource protection, research, education and general administration issues. Detailed SAC responsibilities are listed under the resource protection, research, education and general administration sections which follow.

3. Federal Agencies

The USCG is responsible for enforcing Federal laws in waters under U.S. jurisdiction. This mission includes the enforcement of Sanctuary regulations promulgated for the MBNMS. The USCG also manages operations for the control or removal of oil and hazardous substances resulting from offshore spills. In addition to enforcing fishing and vessel discharge regulations, the USCG is also responsible for regulating vessel traffic, maintaining boater safety, and coordinating search and rescue operations.

The United States Fish and Wildlife Service and National

Marine Fisheries Service (NMFS) also have existing management and enforcement capabilities in the proposed Sanctuary area with regards to fisheries, marine mammals and endangered species.

The EPA has regulatory responsibilities with regard to sewage outfalls, and ocean dumping. EPA has delegated discharge permitting authority to the State government.

The Corps of Engineers grant permits that are based on EPA guidelines for the discharge of dredged materials into State waters. The Corps has sole jurisdiction over marine construction, excavation or fill in any navigable waters of the United States.

The United States Army and Navy both conduct military training activities in the proposed Sanctuary area.

4. State, regional and local agencies

The Monterey Bay area already has an infrastructure for coastal resource management and numerous personnel with enforcement training as well as wide experience with the resources and user groups within the proposed Sanctuary area. In general NOAA will work closely within the existing administrative framework of State, regional and local resource management agencies such as the State of California's Resources Agency, which is responsible for the management and enforcement at the variety of State parks, beaches, refuges and reserves. Other California state agencies with existing primary jurisdiction in the area of Monterey Bay are: the Coastal Commission, the Regional Water Quality Control Board, the State Lands Commission, the Air Resources Board and the Historical

Resources Commission.

It is NOAA's intent to work closely with the State to ensure full Federal-State cooperation and to coordinate the Sanctuary program effectively with the existing State administrative framework. This cooperation will involve the formalization of Cooperative Agreements, Memoranda of Understanding and deputization of officials, if necessary, for enforcement purposes.

NOAA will also cooperate with regional organizations such as the Association of Monterey Bay Area Governments (AMBAG), local fishery organizations and Harbor Masters as well as with the Cities of Monterey, Santa Cruz and Moss Landing.

To facilitate the administrative procedures regarding certification and notification of leases, licenses, permits, approvals, rights or other authorizations (as described above, Part II, Section III, B.2. Designation Document and Regulations), NOAA intends to work closely with the owners or holders of, or applicants for, leases, licenses, permits, approvals, rights or other authorizations as well as with the appropriate issuing agencies. The Sanctuary Manager will also work with AMBAG to receive notices of activities that may affect the proposed Sanctuary. For example, the AMBAG Regional Metropolitan Clearinghouse for activities of regional significance would serve to assist in establishing increased local government involvement with the proposed Sanctuary.

B. Resource Protection: Roles and Responsibilities

1. Sanctuaries and Reserves Division

- (a) Approves priorities for funding for resource protection and monitors and maintains a record of research activities within the Sanctuary;
- (b) Monitors the effectiveness of interagency agreements for surveillance and enforcement and negotiates changes where required;
- (c) Develops contingency and emergency-response plans and, based on these plans, negotiates applicable interagency agreements;
- (d) Monitors the effectiveness of existing Sanctuary regulations and promulgates changes where necessary; and
- (e) Coordinates efforts to protect and manage Sanctuary resources with other Federal, state, regional and local agencies and with public and private organizations as well.

2. Sanctuary Manager

- (a) Recommends to the SRD priorities for allocating funds annually to resource protection, considering the advice of the SAC to ensure consistency with Sanctuary regulations and provide adequate resource protection;
- (b) Assists in the coordination of surveillance and enforcement activities by providing liaison with the Federal, state, regional and local agencies;
- (c) Reports regularly to the SRD on surveillance and enforcement activities, violations, and emergencies;
- (d) Provides information for use in training Sanctuary enforcement officials;
- (e) Monitors and evaluates research activities within the Sanctuary, and the adequacy of emergency-response plans and procedures in the Sanctuary;
- (f) Maintains a record of research activities within the Sanctuary, and emergency events (e.g., oil spills) in and around the Sanctuary; and
- (g) Evaluates overall progress toward the resource protection objectives of the Sanctuary program and prepares semi-annual and bi-monthly progress reports highlighting activities for the SRD.

3. Sanctuary Advisory Committee

- (a) Advises the Sanctuary Manager on the effectiveness of interagency agreements for surveillance and enforcement and;
- (b) Advises the Sanctuary Manager on the effectiveness of the Sanctuary regulations in providing adequate resource protection.

4. Federal Agencies

- (a) USCG holds broad responsibility for enforcing all Federal laws throughout the Sanctuary;
- (b) USCG ensures enforcement of Sanctuary regulations;
- (c) USCG provides on-scene coordination and Regional Response Center facilities under the National Contingency Plan for the removal of oil and hazardous substances in the event of a spill that threatens the Sanctuary;
- (d) NMFS works with the CDF&G, under the Magnuson Fishery Conservation and Management Act (MFCMA), on approving and enforcing Fishery Management Plans (FMPs) prepared by regional fishery management councils to ensure protection of fishery resources;
- (e) NMFS shares responsibility with the FWS for implementation of the Marine Mammal Protection Act and the Endangered Species Act to prevent taking of any endangered, threatened or otherwise depleted species;
- (f) EPA has regulatory responsibilities with regard to sewage outfalls (under the Clean Water Act via National Pollutant Discharge Elimination System (NPDES) Permits), and ocean dumping (under Title I of the Marine Protection, Research, and Sanctuaries Act) to protect water quality;
- (g) The Corps of Engineers (COE) grants permits that are based on EPA guidelines for the discharge of dredged materials into State waters. Pursuant to the Rivers and Harbors Act, a permit must be obtained from the COE prior to any marine construction, excavation or fill activities in any navigable waters of the United States (33 U.S.C. 403). The COE may refuse to issue permits on the basis of a threat to navigation or potential adverse effects on living marine resources.

5. State, regional and local agencies

- (a) California Department of Fish and Game (CDF&G) responsible for managing living resources and enforcement of state laws and regulations throughout the Sanctuary;

- (b) CDF&G is deputized to enforce specific federal laws throughout the Sanctuary (e.g., the Endangered Species Act, MFMCA);
- (c) CDF&G and California Department of Parks and Recreation (CDP&R) evaluate progress towards management objectives for resource protection and adjust annual priorities accordingly;
- (d) CDP&R has established an Underwater Parks Program which is managed in conjunction with CDF&G to protect special marine resources and water-based recreational values in ocean waters within state jurisdiction.
- (e) CDP&R is responsible along with the U.S. Forest Service for the management of the Los Padres National Forest.
- (f) CDF&G and CDP&R monitors the effectiveness of State regulations within the Sanctuary and considers recommended changes to the State regulations through the State Legislature and Governor of California's Office;
- (g) CDF&G monitoring and surveillance of fisheries resources (populations) through port sampling and marine contamination through mussel watch program;
- (h) CDF&G provides on-scene coordination of State clean-up response in the event of an accidental spill of oil or hazardous materials which threaten the State's fish and wildlife resources;
- (i) California Coastal Commission (CCC) under the California Coastal Act of 1976 establishes a comprehensive set of specific policies and issues permits for the protection of coastal resources and the management of orderly economic development throughout the coastal zone;
- (j) The State Lands Commission (SLC) has jurisdiction over all state owned lands and submerged lands. SLC has adopted regulations for the protection and use of public trust lands in the coastal zone;
- (k) State Water Resource Control Board (SWRCB) and the nine regional water quality control boards (RWQCB) have primary authority for regulating water quality in California. The authority to administer the NPDES permits has been delegated by EPA to the SWRCB and by the State to the Regional boards;
- (l) The California Air Resources Board (ARB) is charged with the maintenance and enhancement of the ambient air quality of the State. The ARB has set air quality standards designed to meet National Ambient Air Quality Standards and delegated their implementation to local Air Pollution Control Districts (APCDs); and

- (m) California Historical Resources Commission is the State agency responsible for the preservation of representative and unique archaeological, paleontological, and historical sites in the land and water areas of the state.
- (n) AMBAG is a council of governments with volunteer membership includes membership from Monterey and Santa Cruz counties, 15 cities and Fort Ord, representing the collective interest of the region for the protection of Monterey Bay and its unique coastal and marine resources.

C. Research: Roles and Responsibilities

1. Sanctuaries and Reserves Division

- (a) Reviews annual Sanctuary Research Plan's (SRP's) for each Sanctuary;
- (b) Prepares an annual National Research Plan (NRP) and budget, based on the SRP's of individual Sanctuaries and in accordance with priorities determined at the National level;
- (c) Sets dates for procurement based on the NRP;
- (d) Administers interagency agreements for cooperative funding for research;
- (e) Reviews all interim and final research reports submitted by the Sanctuary Manager; and
- (f) Issues permits for research activities, considering the recommendations of the Sanctuary Manager, to ensure consistency with Sanctuary regulations and provide additional technical review where necessary.

2. Sanctuary Manager

- (a) Recommends generic areas of research to resolve management issues and prepares assessments of research needs and priorities based on management requirements and research continuity;
- (b) Develops and implements the Sanctuary Research Plan (SRP);
- (c) Reviews research documents and progress reports submitted by contractors;
- (d) Coordinates research and monitoring activities in the Sanctuary in cooperation with the SRD, the SAC and other interested agencies or parties; and
- (e) Coordinates and oversees the on-site process for reviewing,

recommending for approval, monitoring and research proposals and permit requests, considering the views of the SRD, Sanctuary Advisory Committee, concerned individuals and interest groups and submits recommendations to SRD on the issuance of Sanctuary research permits.

3. Sanctuary Advisory Committee

- (a) Advises the Sanctuary Manager on review of research proposals, interim, and final reports;
- (b) Advises the Sanctuary Manager on approval of proposals for research in the Sanctuary;
- (c) Advises the Research Coordinator and the Sanctuary Manager on priority research needs; and
- (d) Advises the Sanctuary Manager on the issuance of research permits.

D. Education: Roles and Responsibilities

1. Sanctuaries and Reserves Division

- (a) Reviews and approves the list of annual priorities for education and the annual education budget prepared by the Sanctuary Manager;
- (b) Reviews and approves design proposals for all educational facilities;
- (c) Reviews all educational materials prepared for the Sanctuary;
- (d) Evaluates progress toward accomplishing objectives for education and adjusts long-term priorities accordingly; and
- (e) Issues Sanctuary education permits, considering the recommendations of the Sanctuary Manager, to ensure compliance with Sanctuary regulations and provide additional technical review where necessary.

2. Sanctuary Manager

- (a) Recommends annually to the SRD a list of priorities and an annual budget for education;
- (b) Prepares and circulates as required Requests For Proposals (RFP) for educational projects;
- (c) Supervises the design and production of educational materials and facilities for the Sanctuary;

- (d) Provides training for State staff assigned to the Sanctuary;
- (e) Encourages local and regional organizations to participate in Sanctuary education;
- (f) Disseminates information about the National Marine Sanctuary Program and the Sanctuary; and
- (g) Oversees the development of any facilities constructed for the Sanctuary, reviews site analyses and design specifications, makes recommendations as to construction and maintenance contracts, and performs similar tasks and submits recommendations to SRD, on the issuance of Sanctuary education permits, considering the recommendations of the SAC; and oversees permitted education activities.

3. Sanctuary Advisory Committee

- (a) Advises the Sanctuary Manager, in raising public awareness of the Sanctuary and advises on the development of a local constituency by means of brochures, presentations, structured events articles for publication, and other activities consistent with the management plan;
- (b) Advises the Sanctuary Manager on how to establish and operate combined MBNMS-Elkhorn Slough NERR information and education facilities to increase public awareness and appreciation of the resources of the Sanctuary; and
- (c) Advises the Sanctuary Manager on the issuance of education permits.

E. General Administration: Roles and Responsibilities

1. Sanctuaries and Reserves Division

- (a) Ensures that the Sanctuary is operated in a manner consistent with established National program policies and with applicable National and international laws and provides guidance to the Sanctuary Manager;
- (b) Identifies, analyzes, and resolves Sanctuary management problems and issues;
- (c) Formulates comprehensive, long-term management plans for the Sanctuary and revises the management plan as necessary;
- (d) Directs and assists the Sanctuary Manager in the implementation of the management plan;
- (e) Coordinates Sanctuary management with other Federal and State

agencies and private organizations;

- (f) Evaluates the effectiveness of Sanctuary management and regulatory measures;
- (g) Prepares a program budget for the Sanctuary;
- (h) Provides funding for overall Sanctuary management and administration;
- (i) Makes recommendations to the Director of the Office of Ocean and Coastal Resource Management as to the issuance of National Marine Sanctuary permits containing terms and conditions deemed appropriate (including research and education permits, see above), considering the recommendations of the Sanctuary Manager, to conduct an activity otherwise prohibited by the Sanctuary regulations if the activity will have only negligible, short-term adverse effects on Sanctuary resources or Sanctuary qualities and will: further the educational, natural or historical resource value of the Sanctuary; further salvage or recovery operations in or near the Sanctuary in connection with a recent air or marine casualty; assist in managing the Sanctuary; or further salvage or recovery operations in connection with an abandoned shipwreck in the Sanctuary title to which is held by the State of California;
- (j) Issues certifications, through OCRM, with terms and conditions deemed necessary to achieve the purposes for which the Sanctuary was designated, of pre-existing leases, licenses, permits, approvals, or other authorizations, considering the recommendations of the Sanctuary Manager, to conduct a prohibited activity; and
- (k) Issues terms and conditions, through OCRM, deemed necessary to protect the Sanctuary resources and qualities on applications for leases, licenses, permits, approvals, or other authorizations (or objects to issuance of such authorizations), considering the recommendations of the Sanctuary Manager, to conduct a prohibited activity.

2. Sanctuary Manager

- (a) Coordinates on-site efforts of all parties involved in Sanctuary activities, including State, Federal, local and regional agencies, Elkhorn Slough NERR and the public;
- (b) Reviews the management plan periodically and recommends changes to the SRD as needed;
- (c) Assists the SRD in preparing the annual budget for the Sanctuary;

- (d) Oversees day-to-day operation of the Sanctuary, including administrative functions such as bookkeeping, purchasing and keeping records of visitor activities;
- (e) Supervises Sanctuary staff and other personnel, including enforcement and interpretive employees assigned to the Sanctuary;
- (f) Represents the Sanctuary viewpoint on local issues and at public forums;
- (g) Submits recommendations to SRD on criteria and terms and conditions for National Marine Sanctuary permits, certifications and applications for leases, licenses, permits, approvals, other authorizations, or rights to conduct a prohibited activity.

3. Federal, State, Local and Regional Agencies

- (a) Assist in the preparation and implementation of a comprehensive, long-term management plan for the proposed Sanctuary;
- (b) Assist in the periodic review of the management plan; and
- (c) Appropriate issuing agency assists in the development of criteria and terms and conditions for certifications and applications for leases, licenses, permits, approvals, other authorizations, or rights to conduct a prohibited activity.

4. Sanctuary Advisory Committee

- (a) Advises on the specific plans for Sanctuary developments;
- (b) Advises on all proposals for activities within the Sanctuary;
- (c) Advises the appropriate Federal, State or local government on proposed actions, plans and projects in areas adjacent to or affecting the Sanctuary;
- (d) Enhances communication and cooperation among all interests involved in the Sanctuary;
- (e) Advises on rules and conditions for all forms of public recreation;
- (f) Advises on an overall plan for the use, development and maintenance of Sanctuary lands and building; and
- (g) Advises the Sanctuary Manager on recommendations to SRD on criteria and terms and conditions for National Marine Sanctuary permits, certifications and applications of leases,

licenses, permits, approvals, other authorizations, or rights to conduct a prohibited activity.

F. Staffing Levels

Depending on the budget and personnel assigned to the Monterey Bay National Marine Sanctuary upon designation, staffing would include a NOAA manager, an assistant manager, administrative assistant, research coordinator, education coordinator and a joint position of an interpreter/enforcement official. Specialists in the fields of water quality and existing discharge permit procedures will also be necessary to assist with Sanctuary management of discharges into the proposed Sanctuary. Sanctuary staff will work closely with the USCG, NMFS and other State and Federal agencies in providing enforcement and surveillance in the area of the proposed Sanctuary. The need for additional staff will be determined during the first two years of operation.

G. Headquarters and Visitor Center Facilities

Sanctuary headquarters and administrative offices will be established at a suitable location within the Monterey Bay region. Areas being considered include the Cities of Monterey, Moss Landing and Santa Cruz.

List of Preparers and Acknowledgments

PART VI: LIST OF PREPARERS

TO BE COMPLETED

Mr. Mark Murray-Brown - Program Specialist, Marine and Estuarine Management Division, NOAA. Mr. Murray-Brown was responsible for the overall supervision of this project and preparation of the draft and final EIS/MP and regulations. His academic background includes a Bachelor's degree in Biology from Bates College, ME; a Master's Degree in Oceanography from the Graduate School of Oceanography, University of Rhode Island (URI), RI; and Master's Degree in Marine Policy from the Marine Affairs Department, URI.

Mr. Joseph Flanagan - Environmental Protection Specialist, Ocean Minerals and Energy Division, NOAA. Mr. Flanagan was responsible for synthesizing and collating the information and then writing Part II, Section II, which describes the resources and uses of the Monterey Bay area. His academic background includes a Bachelor's Degree in Geology and Chemistry from the University of Miami, Florida; and a Master's Degree in Environmental Systems Management from American University, Washington D.C.

Ms. Vicki Nickols - Program Specialist Responsible for Volume II Response to Comments.

Mr. John McCleod -

ORCA/SEA: Dan Basta, Tom Culliton, Lisa Vollganeau, Mitch ????.

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Environmental Protection Agency
Federal Energy Regulatory Commission
Marine Mammal Commission
Nuclear Regulatory Commission
Pacific Fishery Management Council

Congressional

Members of the U.S. House Committee on Merchant Marine and Fisheries
Members of the U.S. Senate Committee on Commerce, Science and Transportation
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Honorable William M. Thomas, U.S. House of Representatives
Honorable Tony Coelho, U.S. House of Representatives

California State Government and Agencies

Air Resources Board
Business, Transportation and Housing Agency
Association of Monterey Bay Area Governments
California Coastal Commission
Pacific Marine Fisheries Commission
The Resources Agency of California
Department of Fish and Game
Department of Parks and Recreation
Department of Conservation
Department of Transportation
Department of Boating and Waterways
State Water Resources Control Board
Central Coast Regional Water Quality Control Board
Oakland-San Francisco Bay Regional Water Quality Control Board
Monterey Peninsula Water Management District
State Lands Commission
Office of Emergency Services
Board Of Supervisors, San Mateo County
Board Of Supervisors, Santa Cruz County
Board Of Supervisors, Monterey County
Native American Heritage Commission
Department of Justice

National and Local Interest Groups

American Association of Port Authorities
American Bureau of Shipping
American Cetacean Society
American Fisheries Society
American Gas Association
American Petroleum Institute
Amoco Production Company
Atlantic Richfield Company
Boating Industry Association
Center for Law and Social Policy
Center for Marine Conservation
Central California Diving Council
Central Coast OCS Regional Studies Program
Chevron U.S.A., Inc.
Cities Service Company
Coastal Advocates
Coast Alliance
Conservation Foundation
Continental Oil Company
The Cousteau Society
CZM Newsletter
Defenders of Wildlife
Edison Electric Institute
El Paso Natural Gas Company

National and Local Groups (continued)

Environmental Policy Center
Environmental Defense Fund, Inc.
Environmental Law Institute
Exxon Company, U.S.A.
Friends of the Coast
Friends of the Earth
Friends of the Sea Otter
The Greenpeace Foundation
Gulf Oil Company
Inverness Association
League of Woman Voters
Marine Technology Society
The Marine Wilderness Society
Mobil Oil Corporation
National Association of Conservation Districts
National Association of Counties
National Audubon Society
National Coalition for Marine Conservation, Inc.
National Federation of Fishermen
National Fisheries Institute
National Ocean Industries Association
National Parks and Conservation Association
National Recreation and Park Association
National Research Council
National Wildlife Federation
Natural Resources Defense Council
Natural Resources Law Institute
Pacific Coast Federation of Fisherman's Associations, Inc.
Point Reyes Bird Observatory
Sierra Club
Stinson Beach Village Association
Tomales Bay Association
The Whale Center
Underwater Society of America
Union Oil Company
Water Pollution Control Federation
Wilderness Society
World Wildlife Fund-U.S.

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APPENDICES

APPENDIX A: FEDERAL ADVISORY COMMITTEE ACT AND REGULATIONS

Federal Advisory Committee Act and Regulations



Federal Advisory Committee Act

Public Law 92-463
92nd Congress, H. R. 4383
October 6, 1972

An Act

86 STAT., 770

To authorize the establishment of a system governing the creation and operation of advisory committees in the executive branch of the Federal Government, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as the "Federal Advisory Committee Act".

Federal Advisory Committee Act.

FINDINGS AND PURPOSES

SEC. 2. (a) The Congress finds that there are numerous committees, boards, commissions, councils, and similar groups which have been established to advise officers and agencies in the executive branch of the Federal Government and that they are frequently a useful and beneficial means of furnishing expert advice, ideas, and diverse opinions to the Federal Government.

(b) The Congress further finds and declares that—

(1) the need for many existing advisory committees has not been adequately reviewed;

(2) new advisory committees should be established only when they are determined to be essential and their number should be kept to the minimum necessary;

(3) advisory committees should be terminated when they are no longer carrying out the purposes for which they were established;

(4) standards and uniform procedures should govern the establishment, operation, administration, and duration of advisory committees;

(5) the Congress and the public should be kept informed with respect to the number, purpose, membership, activities, and cost of advisory committees; and

(6) the function of advisory committees should be advisory only, and that all matters under their consideration should be determined, in accordance with law, by the official, agency, or officer involved.

DEFINITIONS

SEC. 3. For the purpose of this Act—

(1) The term "Director" means the Director of the Office of Management and Budget.

(2) The term "advisory committee" means any committee, board, commission, council, conference, panel, task force, or other similar group, or any subcommittee or other subgroup thereof (hereafter in this paragraph referred to as "committee"), which is—

(A) established by statute or reorganization plan, or

(B) established or utilized by the President, or

(C) established or utilized by one or more agencies,

in the interest of obtaining advice or recommendations for the President or one or more agencies or officers of the Federal Government, except that such term excludes (i) the Advisory Commission on Intergovernmental Relations, (ii) the Commission on Government Procurement, and (iii) any committee which is composed wholly of full-time officers or employees of the Federal Government.

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(3) The term "agency" has the same meaning as in section 551(1) of title 5, United States Code.

(4) The term "Presidential advisory committee" means an advisory committee which advises the President.

APPLICABILITY

Sec. 4. (a) The provisions of this Act or of any rule, order, or regulation promulgated under this Act shall apply to each advisory committee except to the extent that any Act of Congress establishing any such advisory committee specifically provides otherwise.

Restrictions.

(b) Nothing in this Act shall be construed to apply to any advisory committee established or utilized by—

- (1) the Central Intelligence Agency; or
- (2) the Federal Reserve System.

(c) Nothing in this Act shall be construed to apply to any local civic group whose primary function is that of rendering a public service with respect to a Federal program, or any State or local committee, council, board, commission, or similar group established to advise or make recommendations to State or local officials or agencies.

RESPONSIBILITIES OF CONGRESSIONAL COMMITTEES

Review.

Sec. 5. (a) In the exercise of its legislative review function, each standing committee of the Senate and the House of Representatives shall make a continuing review of the activities of each advisory committee under its jurisdiction to determine whether such advisory committee should be abolished or merged with any other advisory committee, whether the responsibilities of such advisory committee should be revised, and whether such advisory committee performs a necessary function not already being performed. Each such standing committee shall take appropriate action to obtain the enactment of legislation necessary to carry out the purpose of this subsection.

Ordinances.

(b) In considering legislation establishing, or authorizing the establishment of any advisory committee, each standing committee of the Senate and of the House of Representatives shall determine, and report such determination to the Senate or to the House of Representatives, as the case may be, whether the functions of the proposed advisory committee are being or could be performed by one or more agencies or by an advisory committee already in existence, or by enlarging the mandate of an existing advisory committee. Any such legislation shall—

- (1) contain a clearly defined purpose for the advisory committee;
- (2) require the membership of the advisory committee to be fairly balanced in terms of the points of view represented and the functions to be performed by the advisory committee;
- (3) contain appropriate provisions to assure that the advice and recommendations of the advisory committee will not be inappropriately influenced by the appointing authority or by any special interest, but will instead be the result of the advisory committee's independent judgment;
- (4) contain provisions dealing with authorization of appropriations, the date for submission of reports (if any), the duration of the advisory committee, and the publication of reports and other materials, to the extent that the standing committee determines the provisions of section 10 of this Act to be inadequate; and

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(5) contain provisions which will assure that the advisory committee will have adequate staff (either supplied by an agency or employed by it), will be provided adequate quarters, and will have funds available to meet its other necessary expenses.

(c) To the extent they are applicable, the guidelines set out in subsection (b) of this section shall be followed by the President, agency heads, or other Federal officials in creating an advisory committee.

RESPONSIBILITIES OF THE PRESIDENT

SEC. 6. (a) The President may delegate responsibility for evaluating and taking action, where appropriate, with respect to all public recommendations made to him by Presidential advisory committees.

(b) Within one year after a Presidential advisory committee has submitted a public report to the President, the President or his delegate shall make a report to the Congress stating either his proposals for action or his reasons for inaction, with respect to the recommendations contained in the public report. Report to Congress.

(c) The President shall, not later than March 31 of each calendar year (after the year in which this Act is enacted), make an annual report to the Congress on the activities, status, and changes in the composition of advisory committees in existence during the preceding calendar year. The report shall contain the name of every advisory committee, the date of and authority for its creation, its termination date or the date it is to make a report, its functions, a reference to the reports it has submitted, a statement of whether it is an ad hoc or continuing body, the dates of its meetings, the names and occupations of its current members, and the total estimated annual cost to the United States to fund, service, supply, and maintain such committee. Such report shall include a list of those advisory committees abolished by the President, and in the case of advisory committees established by statute, a list of those advisory committees which the President recommends be abolished together with his reasons therefor. The President shall exclude from this report any information which, in his judgment, should be withheld for reasons of national security, and he shall include in such report a statement that such information is excluded. Annual report to Congress. Exclusion.

RESPONSIBILITIES OF THE DIRECTOR, OFFICE OF MANAGEMENT AND BUDGET

SEC. 7. (a) The Director shall establish and maintain within the Office of Management and Budget a Committee Management Secretariat, which shall be responsible for all matters relating to advisory committees. Committee Management Secretariat. Establishment.

(b) The Director shall, immediately after the enactment of this Act, institute a comprehensive review of the activities and responsibilities of each advisory committee to determine— Review.

- (1) whether such committee is carrying out its purpose;
- (2) whether, consistent with the provisions of applicable statutes, the responsibilities assigned to it should be revised;
- (3) whether it should be merged with other advisory committees; or
- (4) whether it should be abolished.

The Director may from time to time request such information as he deems necessary to carry out his functions under this subsection. Upon the completion of the Director's review he shall make recommendations to the President and to either the agency head or the Congress with respect to action he believes should be taken. Thereafter, the Director shall carry out a similar review annually. Agency heads shall cooperate with the Director in making the reviews required by this subsection. Recommendations to President and Congress. Agency cooperation.

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Performance guidelines. (c) The Director shall prescribe administrative guidelines and management controls applicable to advisory committees, and, to the maximum extent feasible, provide advice, assistance, and guidance to advisory committees to improve their performance. In carrying out his functions under this subsection, the Director shall consider the recommendations of each agency head with respect to means of improving the performance of advisory committees whose duties are related to such agency.

Uniform pay guidelines. (d) (1) The Director, after study and consultation with the Civil Service Commission, shall establish guidelines with respect to uniform fair rates of pay for comparable services of members, staffs, and consultants of advisory committees in a manner which gives appropriate recognition to the responsibilities and qualifications required and other relevant factors. Such regulations shall provide that—

(A) no member of any advisory committee or of the staff of any advisory committee shall receive compensation at a rate in excess of the rate specified for GS-18 of the General Schedule under section 5332 of title 5, United States Code; and

(B) such members, while engaged in the performance of their duties away from their homes or regular places of business, may be allowed travel expenses, including per diem in lieu of subsistence, as authorized by section 5703 of title 5, United States Code, for persons employed intermittently in the Government service.

Travel expenses. (2) Nothing in this subsection shall prevent—

(A) an individual who (without regard to his service with an advisory committee) is a full-time employee of the United States, or

(B) an individual who immediately before his service with an advisory committee was such an employee, from receiving compensation at the rate at which he otherwise would be compensated (or was compensated) as a full-time employee of the United States.

Expense recommendations. (e) The Director shall include in budget recommendations a summary of the amounts he deems necessary for the expenses of advisory committees, including the expenses for publication of reports where appropriate.

RESPONSIBILITIES OF AGENCY HEADS

Advisory Committee Management Control Officer, designation. Sec. 8. (a) Each agency head shall establish uniform administrative guidelines and management controls for advisory committees established by that agency, which shall be consistent with directives of the Director under section 7 and section 10. Each agency shall maintain systematic information on the nature, functions, and operations of each advisory committee within its jurisdiction.

(b) The head of each agency which has an advisory committee shall designate an Advisory Committee Management Officer who shall—

(1) exercise control and supervision over the establishment, procedures, and accomplishments of advisory committees established by that agency;

(2) assemble and maintain the reports, records, and other papers of any such committee during its existence; and

(3) carry out, on behalf of that agency, the provisions of section 552 of title 5, United States Code, with respect to such reports, records, and other papers.

81 Stat. 54.

ESTABLISHMENT AND PURPOSE OF ADVISORY COMMITTEES

Sec. 9. (a) No advisory committee shall be established unless such establishment is—

(1) specifically authorized by statute or by the President; or

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(2) determined as a matter of formal record, by the head of the agency involved after consultation with the Director, with timely notice published in the Federal Register, to be in the public interest in connection with the performance of duties imposed on that agency by law.

Publication in Federal Register.

(b) Unless otherwise specifically provided by statute or Presidential directive, advisory committees shall be utilized solely for advisory functions. Determinations of action to be taken and policy to be expressed with respect to matters upon which an advisory committee reports or makes recommendations shall be made solely by the President or an officer of the Federal Government.

(c) No advisory committee shall meet or take any action until an advisory committee charter has been filed with (1) the Director, in the case of Presidential advisory committees, or (2) with the head of the agency to whom any advisory committee reports and with the standing committees of the Senate and of the House of Representatives having legislative jurisdiction of such agency. Such charter shall contain the following information:

Charter, filing.

Contents.

- (A) the committee's official designation;
- (B) the committee's objectives and the scope of its activity;
- (C) the period of time necessary for the committee to carry out its purposes;
- (D) the agency or official to whom the committee reports;
- (E) the agency responsible for providing the necessary support for the committee;
- (F) a description of the duties for which the committee is responsible, and, if such duties are not solely advisory, a specification of the authority for such functions;
- (G) the estimated annual operating costs in dollars and man-years for such committee;
- (H) the estimated number and frequency of committee meetings;
- (I) the committee's termination date, if less than two years from the date of the committee's establishment; and
- (J) the date the charter is filed.

A copy of any such charter shall also be furnished to the Library of Congress.

Copy.

ADVISORY COMMITTEE PROCEDURES

Sec. 10. (a) (1) Each advisory committee meeting shall be open to the public.

Meetings.

(2) Except when the President determines otherwise for reasons of national security, timely notice of each such meeting shall be published in the Federal Register, and the Director shall prescribe regulations to provide for other types of public notice to insure that all interested persons are notified of such meeting prior thereto.

Notice, Publication in Federal Register, Regulations.

(3) Interested persons shall be permitted to attend, appear before, or file statements with any advisory committee, subject to such reasonable rules or regulations as the Director may prescribe.

(b) Subject to section 552 of title 5, United States Code, the records, reports, transcripts, minutes, appendixes, working papers, drafts, studies, agenda, or other documents which were made available to or prepared for or by each advisory committee shall be available for public inspection and copying at a single location in the offices of the advisory committee or the agency to which the advisory committee reports until the advisory committee ceases to exist.

51 Stat. 54.

(c) Detailed minutes of each meeting of each advisory committee shall be kept and shall contain a record of the persons present, a complete and accurate description of matters discussed and conclusions reached, and copies of all reports received, issued, or approved by the

Minutes.

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Certification. advisory committee. The accuracy of all minutes shall be certified to by the chairman of the advisory committee.
(d) Subsections (a) (1) and (a) (3) of this section shall not apply to any advisory committee meeting which the President, or the head of the agency to which the advisory committee reports, determines is concerned with matters listed in section 552(b) of title 5, United States Code. Any such determination shall be in writing and shall contain the reasons for such determination. If such a determination is made, the advisory committee shall issue a report at least annually setting forth a summary of its activities and such related matters as would be informative to the public consistent with the policy of section 552(b) of title 5, United States Code.

81 Stat. 54.
Annual report. (e) There shall be designated an officer or employee of the Federal Government to chair or attend each meeting of each advisory committee. The officer or employee so designated is authorized, whenever he determines it to be in the public interest, to adjourn any such meeting. No advisory committee shall conduct any meeting in the absence of that officer or employee.

Federal officer or employee, attendance. (f) Advisory committees shall not hold any meetings except at the call of, or with the advance approval of, a designated officer or employee of the Federal Government, and in the case of advisory committees (other than Presidential advisory committees), with an agenda approved by such officer or employee.

AVAILABILITY OF TRANSCRIPTS

Sec. 11. (a) Except where prohibited by contractual agreements entered into prior to the effective date of this Act, agencies and advisory committees shall make available to any person, at actual cost of duplication, copies of transcripts of agency proceedings or advisory committee meetings.

"Agency proceeding."
80 Stat. 382. (b) As used in this section "agency proceeding" means any proceeding as defined in section 551(12) of title 5, United States Code.

FISCAL AND ADMINISTRATIVE PROVISIONS

Recordkeeping. Sec. 12. (a) Each agency shall keep records as will fully disclose the disposition of any funds which may be at the disposal of its advisory committees and the nature and extent of their activities. The General Services Administration, or such other agency as the President may designate, shall maintain financial records with respect to Presidential advisory committees. The Comptroller General of the United States, or any of his authorized representatives, shall have access, for the purpose of audit and examination, to any such records.

Audit. (b) Each agency shall be responsible for providing support services for each advisory committee established by or reporting to it unless the establishing authority provides otherwise. Where any such advisory committee reports to more than one agency, only one agency shall be responsible for support services at any one time. In the case of Presidential advisory committees, such services may be provided by the General Services Administration.

Agency support services.

RESPONSIBILITIES OF LIBRARY OF CONGRESS

Reports and background papers.
Depository. Sec. 13. Subject to section 552 of title 5, United States Code, the Director shall provide for the filing with the Library of Congress of at least eight copies of each report made by every advisory committee and, where appropriate, background papers prepared by consultants. The Librarian of Congress shall establish a depository for such reports and papers where they shall be available to public inspection and use.

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TERMINATION OF ADVISORY COMMITTEES

SEC. 14. (a) (1) Each advisory committee which is in existence on the effective date of this Act shall terminate not later than the expiration of the two-year period following such effective date unless—

(A) in the case of an advisory committee established by the President or an officer of the Federal Government, such advisory committee is renewed by the President or that officer by appropriate action prior to the expiration of such two-year period; or

(B) in the case of an advisory committee established by an Act of Congress, its duration is otherwise provided for by law.

(2) Each advisory committee established after such effective date shall terminate not later than the expiration of the two-year period beginning on the date of its establishment unless—

(A) in the case of an advisory committee established by the President or an officer of the Federal Government such advisory committee is renewed by the President or such officer by appropriate action prior to the end of such period; or

(B) in the case of an advisory committee established by an Act of Congress, its duration is otherwise provided for by law.

(b) (1) Upon the renewal of any advisory committee, such advisory committee shall file a charter in accordance with section 9(c). Renewal.

(2) Any advisory committee established by an Act of Congress shall file a charter in accordance with such section upon the expiration of each successive two-year period following the date of enactment of the Act establishing such advisory committee.

(3) No advisory committee required under this subsection to file a charter shall take any action (other than preparation and filing of such charter) prior to the date on which such charter is filed.

(c) Any advisory committee which is renewed by the President or any officer of the Federal Government may be continued only for successive two-year periods by appropriate action taken by the President or such officer prior to the date on which such advisory committee would otherwise terminate. Continuation.

EFFECTIVE DATE

SEC. 15. Except as provided in section 7(b), this Act shall become effective upon the expiration of ninety days following the date of enactment.

Approved October 6, 1972.

LEGISLATIVE HISTORY:

HOUSE REPORTS: No. 92-1017 (Comm. on Government Operations) and No. 92-1403 (Comm. of Conference).

SENATE REPORT No. 92-1098 accompanying S. 3529 (Comm. on Government Operations).

CONGRESSIONAL RECORD, Vol. 118 (1972):

May 9, considered and passed House.

Sept. 12, considered and passed Senate, amended, in lieu of S. 3529.

Sept. 19, Senate agreed to conference report.

Sept. 20, House agreed to conference report.

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"(iii) all written responses, and memoranda stating the substance of all oral responses, to the materials described in clauses (i) and (ii) of this subparagraph;

"(D) upon receipt of a communication knowingly made or knowingly caused to be made by a party in violation of this subsection, the agency, administrative law judge, or other employee presiding at the hearing may, to the extent consistent with the interests of justice and the policy of the underlying statutes, require the party to show cause why his claim or interest in the proceeding should not be dismissed, denied, disregarded, or otherwise adversely affected on account of such violation; and

"(E) the prohibitions of this subsection shall apply beginning at such time as the agency may designate, but in no case shall they begin to apply later than the time at which a proceeding is noticed for hearing unless the person responsible for the communication has knowledge that it will be noticed, in which case the prohibitions shall apply beginning at the time of his acquisition of such knowledge.

Applicability.

"(2) This subsection does not constitute authority to withhold information from Congress."

(b) Section 551 of title 5, United States Code, is amended—

(1) by striking out "and" at the end of paragraph (12);

(2) by striking out the "act." at the end of paragraph (13) and inserting in lieu thereof "act; and"; and

(3) by adding at the end thereof the following new paragraph:

"(14) 'ex parte communication' means an oral or written communication not on the public record with respect to which reasonable prior notice to all parties is not given, but it shall not include requests for status reports on any matter or proceeding covered by this subchapter."

"Ex parte communication."

(c) Section 556(d) of title 5, United States Code, is amended by inserting between the third and fourth sentences thereof the following new sentence: "The agency may, to the extent consistent with the interests of justice and the policy of the underlying statutes administered by the agency, consider a violation of section 557(d) of this title sufficient grounds for a decision adverse to a party who has knowingly committed such violation or knowingly caused such violation to occur."

5 USC 557.

CONFORMING AMENDMENTS

Sec. 5. (a) Section 410(b)(1) of title 29, United States Code, is amended by inserting after "Section 552 (public information)," the words "section 552a (records about individuals), section 552b (open meetings)."

(b) Section 552(h)(3) of title 5, United States Code, is amended to read as follows:

"(3) specifically exempted from disclosure by statute (other than section 552h of this title), provided that such statute (A) requires that the matters be withheld from the public in such a manner as to leave no discretion on the issue, or (B) establishes particular criteria for withholding or refers to particular types of matters to be withheld;"

(c) Subsection (d) of section 10 of the Federal Advisory Committee Act is amended by striking out the first sentence and inserting in lieu thereof the following: "Subsections (a)(1) and (a)(3) of this section shall not apply to any portion of an advisory committee meeting where

5 USC app. L

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the President, or the head of the agency to which the advisory committee reports, determines that such portion of such meeting may be closed to the public in accordance with subsection (c) of section 552b of title 5, United States Code.”

EFFECTIVE DATE

5 USC 552b
note.

Sec. 6. (a) Except as provided in subsection (b) of this section, the provisions of this Act shall take effect 180 days after the date of its enactment.

(b) Subsection (g) of section 552b of title 5, United States Code, as added by section 3(a) of this Act, shall take effect upon enactment.

Approved September 13, 1976.

LEGISLATIVE HISTORY:

HOUSE REPORTS: No. 94-880, Pt. 1 and No. 94-880, Pt. 2, accompanying H. R. 11656 (Comm. on Government Operations) and No. 94-1441 (Comm. of Conference).

SENATE REPORTS: No. 94-354 (Comm. on Government Operations), No. 94-381 (Comm. on Rules and Administration) and No. 94-1178 (Comm. of Conference).

CONGRESSIONAL RECORD:

Vol. 121 (1975): Nov. 5, 6, considered and passed Senate.

Vol. 122 (1976): July 28, considered and passed House, amended, in lieu of H. R. 11656.

Aug. 31, House and Senate agreed to conference report.

WEEKLY COMPILATION OF PRESIDENTIAL DOCUMENTS:

Vol. 12, No. 38 (1976): Sept. 13, Presidential statement.

Handicapped Federal Employees, Personal Assistants, Employment (excerpt)

94 STAT. 3040

PUBLIC LAW 96-523—DEC. 12, 1980

Travel expenses.

“(d)(1) In the case of any handicapped employee (including a blind or deaf employee) traveling on official business, the head of the agency may authorize the payment to an individual to accompany or assist (or both) the handicapped employee for all or a portion of the travel period involved. Any payment under this subsection to such an individual may be made either directly to that individual or by advancement or reimbursement to the handicapped employee.

Payment limitation.

“(2) With respect to any individual paid to accompany or assist a handicapped employee under paragraph (1) of this subsection—

“(A) the amount paid to that individual shall not exceed the limit or limits which the Office of Personnel Management shall prescribe by regulation to ensure that the payment does not exceed amounts (including pay and, if appropriate, travel expenses and per diem allowances) which could be paid to an employee assigned to accompany or assist the handicapped employee; and

5 USC 8101 et seq.

“(B) that individual shall be considered an employee, but only for purposes of chapter 81 of this title (relating to compensation for injury) and sections 2671 through 2680 of title 28 (relating to tort claims).

“(e) This section may not be held or considered to prevent or limit in any way the assignment to a handicapped employee (including a blind or deaf employee) by an agency of clerical or secretarial assistance, at the expense of the agency under statutes and regulations currently applicable at the time, if that assistance normally is provided, or authorized to be provided, in that manner under currently applicable statutes and regulations.”

(b) The item relating to section 3102 in the analysis of chapter 31 of title 5, United States Code, is amended to read as follows:

“3102. Employment of personal assistants for handicapped employees, including blind and deaf employees.”

(c)(1) Section 604(a)(16)(A) of title 28, United States Code, is amended by striking out “3102” and inserting in lieu thereof “3102(b)”.

(2) Section 410(b)(1) of title 39, United States Code, is amended by striking out “3102 (employment of reading assistants for blind employees and interpreting assistants for deaf employees),” and inserting in lieu thereof “section 3102 (employment of personal assistants for blind, deaf, or otherwise handicapped employees).”

Am. p. 3039.

Sec. 2. Section 7(d)(1) of the Federal Advisory Committee Act (5 U.S.C. App.) is amended by striking out “and” at the end of subparagraph (A), by striking out the period at the end of subparagraph (B) and inserting “; and” in lieu thereof, and by adding at the end thereof the following new subparagraph:

“(C) such members—

“(i) who are blind or deaf or who otherwise qualify as handicapped individuals (within the meaning of section 501 of the Rehabilitation Act of 1973 (29 U.S.C. 794)), and

“(ii) who do not otherwise qualify for assistance under section 3102 of title 5, United States Code, by reason of being an employee of an agency (within the meaning of section 8102(a)(1) of such title 5),

may be provided services pursuant to section 3102 of such title 5 while in performance of their advisory committee duties.”

29 USC 791. Am. p. 3039.

Effective date. 5 USC 3102 note.

Sec. 3. The amendments made by this Act shall take effect sixty days after the date of the enactment of this Act.

Sec. 4. (a) Section 8332 of title 5, United States Code, is amended by adding at the end thereof the following new subsection:

Congressional Reports Elimination Act of 1982 (excerpt)

PUBLIC LAW 97-375—DEC. 21, 1982

96 STAT. 1821

mendations as he may deem proper as to the best means of preventing such injuries".

(c) The second sentence of section 19(b) of the Occupational Safety and Health Act of 1970 (29 U.S.C. 668(b); 84 Stat. 1590) is repealed.

REPORTS BY THE DEPARTMENT OF TRANSPORTATION

Sec. 111. (a) Section 151(g) of title 23, United States Code (87 Stat. 285), is amended by striking out the third and fourth sentences and inserting in lieu thereof, "No State shall submit any such report to the Secretary for any year after the second year following completion of the pavement marking program in that State."

(b) Section 602 of the Regional Rail Reorganization Act of 1973 (45 U.S.C. 792; 87 Stat. 1022) is repealed. Repeal.

(c) Section 4417a(19) of the Revised Statutes (46 U.S.C. 391a(19)) is repealed.

(d) Section 515 of the Railroad Revitalization and Regulatory Reform Act of 1976 (45 U.S.C. 835; 90 Stat. 82) is repealed.

(e) Section 10 of the Emergency Rail Services Act of 1970 (45 U.S.C. 669; 84 Stat. 1978) is repealed. Repeal.

REPORT BY THE DEPARTMENT OF THE TREASURY

Sec. 112. Section 602(c) of the Act of June 3, 1980, entitled "An Act to provide for increased participation by the United States in the Inter-American Development Bank, and the African Development Fund" (22 U.S.C. 262j(c); 94 Stat. 433), is repealed.

REPORT BY THE INTERSTATE COMMERCE COMMISSION

Sec. 113. Section 10327(D) of title 49, United States Code (92 Stat. 1350), is amended by striking out the last two sentences.

REPORT BY THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Sec. 114. Section 2304(e) of title 16, United States Code, is repealed.

REPORT BY THE NUCLEAR REGULATORY COMMISSION

Sec. 115. Section 11 of the Act of November 6, 1978, entitled "An Act to authorize appropriations to the Nuclear Regulatory Commission for fiscal year 1979, and for other purposes" (42 U.S.C. 2205a; 92 Stat. 2953), is repealed. Repeal.

TITLE II—MODIFICATIONS

REPORTS BY THE EXECUTIVE OFFICE OF THE PRESIDENT

Sec. 201. (a) Section 552a(e)(4) of title 5, United States Code, is amended by striking out "at least annually" and inserting in lieu thereof "upon establishment or revision"

(b) Subsection (p) of section 552a of title 5, United States Code, is amended to read as follows:

"(p) ANNUAL REPORT.—The President shall annually submit to the Speaker of the House of Representatives and the President pro tempore of the Senate a report—

Congressional Reports Elimination Act of 1982—continued

96 STAT. 1822

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5 USC 552a note.

"(1) describing the actions of the Director of the Office of Management and Budget pursuant to section 6 of the Privacy Act of 1974 during the preceding year;

"(2) describing the exercise of individual rights of access and amendment under this section during such year;

"(3) identifying changes in or additions to systems of records;

"(4) containing such other information concerning administration of this section as may be necessary or useful to the Congress in reviewing the effectiveness of this section in carrying out the purposes of the Privacy Act of 1974."

Effective date.

(c) Effective July 1, 1983, section 6(c) of the Federal Advisory Committee Act (5 U.S.C. App.) is amended by striking out the first sentence and inserting in lieu thereof the following: "The President shall, not later than December 31 of each year, make an annual report to the Congress on the activities, status, and changes in the composition of advisory committees in existence during the preceding fiscal year."

REPORTS BY THE DEPARTMENT OF COMMERCE

Sec. 202. (a) Section 302(d) of the Marine Protection, Research, and Sanctuaries Act of 1972 (16 U.S.C. 1432(d)) is amended to read as follows:

"(d) The Secretary shall submit a biennial report to the Congress, on or before March 1 of every other year beginning in 1984, setting forth a comprehensive review of his actions during the previous two fiscal years undertaken pursuant to the authority of this section, together with appropriate recommendation for legislation considered necessary for the designation and protection of marine sanctuaries."

(b) Section 7 of the National Climate Program Act of 1978 (15 U.S.C. 2906) is amended by striking out "not later than January 30 of each year" and inserting in lieu thereof "not later than March 31 of each year".

(c) Section 4(a) of the National Ocean Pollution Research and Development and Monitoring Planning Act of 1978 (33 U.S.C. 1703(a)) is amended by striking out "and a revision of the plan shall be prepared and so submitted by September 15 of each odd-numbered year occurring after 1979" and inserting in lieu thereof "and a revision of the plan shall be prepared and so submitted by September 15 every three years after 1979".

(d) Section 8 of the Fair Packaging and Labeling Act (15 U.S.C. 1457) is amended by striking out the following: "or to participate in the development of voluntary product standards with respect to any consumer commodity under procedures referred to in section 5(d) of this Act,".

REPORTS BY THE DEPARTMENT OF DEFENSE

Sec. 203. (a)(1) Section 803(a) of the Department of Defense Appropriation Authorization Act, 1978 (50 U.S.C. 1520(a); 91 Stat. 334) is amended by striking out clause (1) and by striking out "(2)".

(2) Section 409(a) of the Act of November 19, 1969 (50 U.S.C. 1511(a); 83 Stat. 209), is amended by adding the following sentence at the end thereof: "The report shall include a full accounting of all experiments and studies conducted by the Department of Defense in the preceding year, whether directly or under contract, which

THE PRESIDENT

Relating to the Transfer of Certain Advisory Committee Functions

Executive Order 12024

December 1, 1977

By virtue of the authority vested in me by the Constitution and statutes of the United States of America, including the Federal Advisory Committee Act, as amended (5 U.S.C. App. I), Section 301 of Title 3 of the United States Code, Section 202 of the Budget and Accounting Procedures Act of 1950 (31 U.S.C. 581c), and Section 7 of Reorganization Plan No. 1 of 1977 (42 FR 56101 (October 21, 1977)), and as President of the United States of America, in accord with the transfer of advisory committee functions from the Office of Management and Budget to the General Services Administration provided by Reorganization Plan No. 1 of 1977, it is hereby ordered as follows:

SECTION 1. The transfer, provided by Section 5F of Reorganization Plan No. 1 of 1977 (42 FR 56101), of certain functions under the Federal Advisory Committee Act, as amended (5 U.S.C. App. I), from the Office of Management and Budget and its Director to the Administrator of General Services is hereby effective.

SEC. 2. There is hereby delegated to the Administrator of General Services all the functions vested in the President by the Federal Advisory Committee Act, as amended, except that, the annual report to the Congress required by Section 6(c) of that Act shall be prepared by the Administrator for the President's consideration and transmittal to the Congress.

SEC. 3. The Director of the Office of Management and Budget shall take all actions necessary or appropriate to effectuate the transfer of functions provided in this Order, including the transfer of funds, personnel and positions, assets, liabilities, contracts, property, records, and other items related to the functions transferred.

SEC. 4. Executive Order No. 11769 of February 21, 1974 is hereby revoked.

SEC. 5. Any rules, regulations, orders, directives, circulars, or other actions taken pursuant to the functions transferred or reassigned as provided in this Order from the Office of Management and Budget to the Administrator of General Services, shall remain in effect as if issued by the Administrator until amended, modified, or revoked.

SEC. 6. This Order shall be effective November 20, 1977.



THE WHITE HOUSE,
December 1, 1977.

**GENERAL SERVICES
ADMINISTRATION****41 CFR Part 101-6**

(FPMR Amendment A-40)

**Federal Advisory Committee
Management****AGENCY:** Office of Administration, GSA.**ACTION:** Final rule.

SUMMARY: This final rule provides administrative and interpretive guidelines and management controls for Federal agencies concerning the implementation of the Federal Advisory Committee Act, as amended (5 U.S.C., App.) (hereinafter "the Act"). In a previous issue of the *Federal Register*, GSA published an interim final rule on the management of Federal advisory committees and requested comments (48 FR 19324; April 28, 1983). Additional comments were requested through an advance notice of proposed rulemaking published in the *Federal Register* on February 13, 1987 (52 FR 4631). A new proposed rule, removing suggested limitations on the size of Federal advisory committees, eliminating requirements for the provision of updated committee membership data on a quarterly basis and restrictions on the compensation of committee members, and reflecting other actions to streamline compliance with the Act, was published in the *Federal Register* on May 19, 1987 (52 FR 18774), with a 90-day comment period ending on August 17. All comments received were considered in formulating this final rule which is intended to improve the management and use of Federal advisory committees in the Executive Branch of the Federal Government.

EFFECTIVE DATE: January 4, 1988.**ADDRESSES:** General Services Administration, Committee Management Secretariat (CTM), Washington, DC 20405.

Copies of all comments received are available for public inspection in Room 7030 of the General Services Building, 18th and F Streets NW., Washington, DC.

FOR FURTHER INFORMATION CONTACT: James L. Dean, Director, Committee Management Secretariat, Office of Management Services, Office of Administration, General Services Administration, Washington, DC 20405 (202) 523-1343.

SUPPLEMENTARY INFORMATION:**Background**

GSA's authority for administering the Act is contained in section 7 of the Act

and Executive Order 12024 (42 FR 81445, 3 CFR, 1977 Comp., p. 158). Under Executive Order 12024, the President delegated to the Administrator of General Services all of the functions vested in the President by the Act, as amended, except that the Annual Report to the Congress required by Section 6(c) shall be prepared by the Administrator for the President's consideration and transmittal to the Congress.

Discussion of Comments

As stated above, GSA issued a proposed rule on the management of Federal advisory committees in the *Federal Register* and invited comments. Nineteen commenters responded. Seven commenters had no substantive recommendations and were fully supportive of the proposed rule. Twelve others offered suggestions for improving numerous sections and the disposition of these recommendations is addressed as follows:

Clarify the Distinction Between Operational as Opposed to Advisory Committees

Two commenters suggested that further guidance in the final rule was necessary to assist agencies in interpreting what constitutes primarily an operational committee as opposed to one which performs only advisory functions, in order to determine coverage under the Act. Accordingly, GSA has added language to § 101-6.1004(g) in the final rule which more fully describes what, in general, constitutes operational functions.

While the legislative history of the Act contains the concept for the exclusion of operational committees, there is no precise legal definition of operational committee in either the Act or its legislative history. GSA believes that operational functions to be performed by an advisory committee must be so authorized by law, since the making or implementation of Government decisions is normally reserved to Federal officials as opposed to advisory committees. Additionally, sections 2(b)(6) and 9(b) of the Act provide that, unless specifically provided by statute or Presidential directive, advisory committees may not make determinations or express policy in matters under their consideration. Given the additional language in this final rule, GSA believes that it will be easier for agencies to identify committees which perform primarily operational functions.

Provide for Coverage Under the Act When Certain Groups Provide Consensus or Recurrent Advice

One commenter stated that the language in § 101-6.1004 (i) and (j) of the proposed rule was too tentative to specifically provide that acceptance of consensus advice or advice on a recurring basis from certain groups were determinants for coverage under the Act. GSA has accepted these suggestions and has strengthened the wording of these sections in the final rule.

Agencies are, in effect, cautioned that the Act would apply when an agency accepts the deliberations of a group as a source of consensus advice, when heretofore the agency had been obtaining the advice of attendees on an individual basis only. Also, when an agency recurrently uses a group at the group's request, as a source of advice on a preferential basis, exclusion of coverage under the Act may become questionable even if the group continues only to express its own views without further solicitations from Federal officials.

Strengthen the Provision for Excluding Coverage of So-Called Fact-Finding Subgroups

Several commenters were of the opinion that so-called fact-finding subgroups should continue to be excluded from coverage under the Act. However, it was their general consensus that § 101-6.1004(k) of the proposed rule was less than clear in including both the members of an advisory committee and any of its subcommittee members in this exclusion. One commenter felt strongly that this exclusion should apply to all members of an advisory committee and its subcommittees, whether or not the subcommittee members are members of the parent committee. GSA agrees with this recommendation since it parallels the language and intent expressed in § 101-6.1007(b) (3) and (4) which clarify certain requirements applicable to subcommittees. GSA has reworded the definition of "Advisory Committee" in § 101.6.1003 of the final rule to follow more precisely the language in section 3(2) of the Act, and has been more consistent in the use of the term "subcommittee" in § 101-6.1004(k) and § 101-6.1007(b)(3) of the final rule.

Another commenter felt that the language in § 101-6.1004(k) was not strong enough to preclude fact-finding subgroups from preparing what ultimately becomes the advice and recommendations of the chartered advisory committee, as opposed to

simply gathering information and analyzing facts for the committee. GSA has modified the language in this provision to clarify that the results of such fact-finding activities are to be subject to the deliberation of a chartered advisory committee, or a subcommittee when subsequently conducting a meeting under the Act.

Provide Additional Guidance on the Requirements Applicable to Subcommittees

One commenter requested that the final rule provide additional guidance on the applicability of various requirements of the Act to subcommittees. Since the definition of "advisory committee" in section 3(2) of the Act specifically includes " * * * any subcommittee or other subgroup thereof * * * ", GSA believes all requirements of advisory committees in the Act also apply to subcommittees. Furthermore, the Act itself contains no provisions for subcommittees which differ from those applicable to a full or parent committee. Absent more specific language in the Act, additional guidance by GSA which might serve to differentiate any requirements of subcommittees from those of advisory committees would be inconsistent with the Act.

Exclude From Coverage Under the Act Groups Convened by Agencies on an Ad Hoc Basis

One commenter recommended that the final rule contain an exclusion from coverage under the Act for so-called *ad hoc* groups lacking formal organization, structure, or continuing existence; convened by an agency to obtain views on particular matters of immediate concern. GSA is of the opinion that such an exclusion is not appropriate since the Act itself neither defines nor specifically excludes such groups. In fact, section 6(c) of the Act, providing for the President's annual report to the Congress, requires a statement for each advisory committee, " * * * of whether it is an *ad hoc* or continuing body * * * ". Accordingly, GSA has not accepted the recommendation to exclude *ad hoc* groups since GSA believes that the language of section 6(c) of the Act evidences the intent of the Congress that a group is not to be excluded from coverage merely because it is convened on an *ad hoc*, or temporary basis.

Provide That Agencies May Exercise Policy Decisions in Issuing Exclusions for One-Time Meetings

In a comment directed toward GSA's position stated in the discussion of prior comments in the proposed rule (see 52 FR 18774, SUPPLEMENTARY

INFORMATION); a commenter suggested that the final rule should not preclude agencies from issuing an exclusion for one-time meetings. This commenter felt that GSA's opinion, that such an exclusion in the rule was not appropriate in view of the limited litigation history, should not bar agencies from issuing such exclusions. In fact, it was the opinion of this commenter that the absence of litigation history was not sufficient reason to limit management discretion.

GSA continues to believe that a one-time meeting exclusion in the final rule would be inconsistent with the Act, and does not intend to provide either a direct exclusion in § 101-6.1004 or provide that such a decision may be left to an agency, thereby implying GSA's support for such exclusions. Accordingly, GSA reiterates its opinion that in the absence of any judicial precedent to the contrary, meetings or groups which take place or meet only once should not be excluded from the Act's coverage solely on this basis.

Eliminate the Agency Requirement to Assess Duplication of Advisory Committees on a Governmentwide Basis

Two commenters pointed out the impracticability of requiring an agency to assess duplication of effort of already existing committees on a Governmentwide basis as opposed to an individual agency basis. Both commenters further asserted that this Governmentwide role could be performed by GSA during its own review process subsequent to the receipt of the agency's proposal in accordance with § 101-6.1007(b) of the rule.

Since GSA is responsible for reviewing and maintaining data on all advisory committees in every agency pursuant to several provisions of the Act, GSA agrees that it can effectively perform this function. GSA can also provide agencies, on request, information on other agency committees relative to potential duplication of effort issues.

GSA has rewritten the language in § 101-6.1007 (a) and (b)(2)(iii) of the final rule to reflect this concept by providing that an agency only consider the functions of a proposed committee for duplication of existing committees in the same agency.

Include the Agency's Plan for Balanced Membership in Federal Register Notices and Charters

One commenter suggested that an agency's plan to attain balanced membership for a proposed advisory committee, to be submitted in conjunction with the review required by

§ 101-6.1007(b) of the proposed rule, should be included in both the Federal Register notice of establishment and in the filed charter.

GSA has not adopted this suggestion for two reasons. First, the agency letter proposing the establishment of an advisory committee under general agency authority already contains this information, as specified by § 101-6.1007(b)(2)(iii) of the rule, and this letter would be a public record following the establishment of the advisory committee. Second, inclusion of this information in the Federal Register notice of establishment and the filed charter is not specifically required under sections 9 (a)(2) and (c) of the Act. For purposes of this comment, GSA has not altered § 101-6.1007(b)(1) or § 101-6.1015(a)(1) of the final rule.

Provide Additional Guidance on Balanced Representation and Selection of Members

One commenter was concerned that the proposed rule did not contain sufficient guidance on balanced representation and the selection of members, and suggested that the final rule provide additional instructions for agencies to follow in these areas. GSA recognizes that the guidelines in the proposed rule are limited to the language of the Act. However, GSA believes that the provisions of section 5(c) of the Act are broad enough to allow agency discretion in determining advisory committee representation and membership relative to applicable statutes, Executive Orders, and the needs of the agency responsible for the committee. Accordingly, GSA will retain the proposed guidelines in the final rule based on the language of the Act.

Provide Revised Recordkeeping Requirements

Two commenters, directly or indirectly, expressed concern over the recordkeeping requirements contained in the proposed rule. One commenter observed that it was not possible for the Committee Management Officer (CMO) to ensure compliance with sections 10(b), 12(a) and 13 of the Act, as required by § 101-6.1017. Section 10(b) of the Act requires that the records of an advisory committee shall be available at a single location at the advisory committee or the agency to which it reports during the committee's existence. This commenter suggested that GSA relax the requirement of § 101-6.1017.

Another commenter, taking a different view, complained of the haphazard approach by agencies to the public

availability and retention of advisory committee records. This commenter recommended that the regulations be strengthened in these aspects.

For the following reasons, GSA has determined not to adopt the specific suggestions of either commenter. First, section 8(b)(2) of the Act provides that the CMO shall "assemble and maintain the reports, records, and other papers of any such committee during its existence." When sections 8(b)(2) and 10(b) are read together, it is clear that the records of an advisory committee are to be available at a single location and it is the CMO who is responsible for ensuring that this is accomplished. GSA has therefore decided against relaxing the requirements of § 101-6.1017 in the final rule.

The commenter who expressed concern over the haphazard approach to recordkeeping suggested that the final rule should: (1) Require agencies to keep committee records available for a certain period of time after a committee has terminated, and (2) address the perceived unavailability of the deliberative process privilege under the fifth exemption of the Freedom of Information Act (FOIA) to advisory committee records. For the following reasons, GSA has not adopted these comments.

First, pursuant to the National Archives and Records Administration Act of 1984, as amended, Pub. L. 98-497, the Archivist of the United States is responsible for records management in the Federal Government, including the issuance of regulations and guidance for records retention and disposition, as well as the process for identifying records appropriate for transfer to the permanent Archives of the United States. Since the Federal Advisory Committee Act is silent on records disposition for advisory committees, we see no reason or basis for GSA to alter normal Governmentwide procedures in this area which are the responsibility of the Archivist of the United States. Second, the commenter suggested that the Government's settlement of the law suit involving records of the Attorney General's Commission on Pornography was a concession that the deliberative process privilege under the fifth exemption of FOIA does not apply to advisory committees. Since cases may be settled for a variety of reasons which do not involve a decision on the merits, GSA does not believe that the mere settlement of a matter in litigation is dispositive of the legal issues raised in the litigation. Accordingly, GSA has determined not to adopt this suggestion.

Provide Guidance to Agencies Concerning the Applicability of the Anti-Lobbying Statute and Hatch Act to Advisory Committee Members

With respect to § 101-6.1033 of the proposed rule, one commenter stated that unless provided by statute, agencies should not compensate advisory committee members if they provide policy advice on proposals for legislation because this compensation would violate the anti-lobbying statute. (See 18 U.S.C. 1913). The same commenter also stated that GSA should direct agencies to ensure that any members of an advisory committee who are subject to the Hatch Act (5 U.S.C. 7321-7328) are aware of their obligations under that law.

For the following reasons, GSA has adopted neither suggestion. First, GSA does not believe that the traditional activities of an advisory committee fall within the scope of the activities which 18 U.S.C. 1913 was designed to protect against. Second, the Federal Advisory Committee Act itself does not reference the Hatch Act, and there is already a body of regulations on political activities by Federal employees which has been issued by the Office of Personnel Management, 5 CFR Part 733. Also, the Special Counsel of the Merit Systems Protection Board, who has responsibilities for investigation and administrative prosecution of alleged Hatch Act violations, issues advisory opinions on Hatch Act questions. GSA sees no need to issue regulations in this area when there are already regulations in place and an administrative mechanism available through agencies with greater responsibilities in this area than GSA.

Clarify the Procedures for Transmitting Follow-up Reports on Presidential Advisory Committee Recommendations

One commenter requested clarification in § 101-6.1035(a) of the proposed rule on the procedures required for transmittal of follow-up reports to the Congress on the disposition of Presidential advisory committee recommendations, as required by section 6(b) of the Act. GSA has decided to retain the proposed language in the final rule without further modification at this time. GSA agrees that there has been some confusion as to whether the agency responsible for supporting the Presidential advisory committee, or GSA, should transmit the report. GSA intends to propose further guidance in a future revision to this final rule following more consultation with the affected agencies.

Procedural and Administrative Comments

The final rule incorporates numerous technical and procedural recommendations made by several commenters, particularly in the following sections:

Section	Modification
101-6.1007(b)(2)	Requires proposed charter with agency letter.
101-6.1007(d)(1)	Provides that date of charter filing constitutes date of establishment.
101-6.1013 (a)(3) and (c)(3)	Eliminates proposed requirement for providing copies of filing letters to GSA by adding provision for filing dates on charters; makes related change to copies of Presidential advisory committee charters furnished to the Congress.
101-6.1015 (a)(2) and (b)(1)	Provides for timely notices in the Federal Register on a calendar-day basis.
101-6.1017 (a) and (d)	Adds requirements that membership lists and closed meeting determinations be included in records.
101-6.1025(b)	Adds requirement from section 10(c) of the Act on the certification to the accuracy of minutes of meetings.
101-6.1027(b)	Adds requirement to notify Secretariat when an agency head terminates a committee.
101-6.1035(d)	Provides for location for filing copies of reports with the Library of Congress.

Other sections were also amended or revised for clarity of intent, or corrected for errors in content and format.

These sections include:

Section	Modification
101-6.1002(d)	Changes citation of "the Act" to the Government of the Sunshine Act.
101-6.1007(b)(2)(ii)	Clarifies provision for considering the selection of members with respect to attaining balance.
101-6.1009	Corrects title of section to preclude inadvertent exclusion of committees directed or authorized by law, or established by the President.
101-6.1013(b)	Corrects heading of section to preclude inadvertent exclusion of committees authorized by law.
101-6.1015(a)(1)	Clarifies provision that a Federal Register notice of establishment is not required for committees specifically directed by law or established by the President.
101-6.1017	Eliminates sentence concerning files to preclude misinterpretation.
101-6.1019	Clarifies the status and role of the Designated Federal Officer.
101-6.1027(a)(3)	Specifies the means by which the President or an agency head terminates a committee.
101-6.1029(a)(1)	Clarifies the process involving the re-chartering of committees specifically directed by law whose duration extends beyond 2 years.
101-6.1031(a)	Corrects heading of section to encompass committees authorized by law; specifies that the agency head is responsible for minor charter amendments.
101-6.1031(b)	Specifies that the agency head retains final authority for amending certain charters.

Additional Instructions

Pursuant to section 7(d) of the Act, the guidelines contained in this final rule

with respect to uniform fair rates of pay for comparable services for members, staffs and consultants of advisory committees have been established after consultation by the Administrator with the Director, Office of Personnel Management.

Executive Order 12291

GSA has determined that this final rule is not a major rule for purposes of Executive Order 12291 of February 17, 1981, because it will not result in an annual effect on the economy of \$100 million or more, will not cause a major increase in costs to consumers or others, and will not have significant adverse effects. GSA has based all administrative decisions on this final rule on adequate information concerning the need for and consequences of this final rule. GSA has also determined that the potential benefits to society from this final rule far outweigh the potential costs, has maximized the net benefits, and has chosen the alternative involving the least net cost to society.

Regulatory Flexibility Act

These regulations are not subject to the regulatory flexibility analysis or other requirements of 5 U.S.C. 603 and 604.

List of Subjects in 41 CFR Part 101-6

Civil rights, Government property management, Grant programs, Intergovernmental relations, Surplus Government property, Relocation assistance, Real property acquisition, Federal advisory committees.

Accordingly, 41 CFR Part 101-6 is amended as follows:

PART 101-6—MISCELLANEOUS REGULATIONS

1. The authority citation for 41 CFR Part 101-6 continues to read as follows:

Authority: Sec. 205(c), 63 Stat. 390; 40 U.S.C. 486(c); sec. 7, 5 U.S.C., App.; and E.O. 12024, 3 CFR 1977 Comp., p. 158.

2. Subpart 101-6.10 is revised to read as follows:

Subpart 101-6.10—Federal Advisory Committee Management

- Sec.
- 101-6.1001 Scope.
- 101-6.1002 Policy.
- 101-6.1003 Definitions.
- 101-6.1004 Examples of advisory meetings or groups not covered by the Act or this subpart.
- 101-6.1005 Authorities for establishment of advisory committees.
- 101-6.1006 [Reserved]
- 101-6.1007 Agency procedures for establishing advisory committees.

- Sec.
- 101-6.1008 The role of GSA.
- 101-6.1009 Responsibilities of an agency head.
- 101-6.1010 [Reserved]
- 101-6.1011 Responsibilities of the chairperson of an independent Presidential advisory committee.
- 101-6.1012 [Reserved]
- 101-6.1013 Charter filing requirements.
- 101-6.1014 [Reserved]
- 101-6.1015 Advisory committee information which must be published in the Federal Register.
- 101-6.1016 [Reserved]
- 101-6.1017 Responsibilities of the agency Committee Management Officer.
- 101-6.1018 [Reserved]
- 101-6.1019 Duties of the Designated Federal Officer.
- 101-6.1020 [Reserved]
- 101-6.1021 Public participation in advisory committee meetings.
- 101-6.1022 [Reserved]
- 101-6.1023 Procedures for closing an advisory committee meeting.
- 101-6.1024 [Reserved]
- 101-6.1025 Requirement for maintaining minutes of advisory committee meetings.
- 101-6.1026 [Reserved]
- 101-6.1027 Termination of advisory committees.
- 101-6.1028 [Reserved]
- 101-6.1029 Renewal and rechartering of advisory committees.
- 101-6.1030 [Reserved]
- 101-6.1031 Amendments to advisory committee charters.
- 101-6.1032 [Reserved]
- 101-6.1033 Compensation and expense reimbursement of advisory committee members, staffs and consultants.
- 101-6.1034 [Reserved]
- 101-6.1035 Reports required for advisory committees.

§ 101-6.1001 Scope.

(a) This subpart defines the policies, establish minimum requirements, and provide guidance to agency management for the establishment, operation, administration, and duration of advisory committees subject to the Federal Advisory Committee Act, as amended. Reporting requirements which keep the Congress and the public informed of the number, purpose, membership, activities, and cost of these advisory committees are also included.

(b) The Act and this subpart do not apply to advisory meetings or groups listed in § 101-6.1004.

§ 101-6.1002 Policy.

The policy to be followed by Federal departments, agencies, and commissions, consistent with the Federal Advisory Committee Act, as amended, is as follows:

(a) An advisory committee shall be established only when it is essential to the conduct of agency business. Decision criteria include whether committee deliberations will result in

the creation or elimination of, or change in regulations, guidelines, or rules affecting agency business; whether the information to be obtained is already available through another advisory committee or source within the Federal Government; whether the committee will make recommendations resulting in significant improvements in service or reductions in cost; or whether the committee's recommendations will provide an important additional perspective or viewpoint impacting agency operations;

(b) An advisory committee shall be terminated whenever the stated objectives of the committee have been accomplished; the subject matter or work of the committee has become obsolete by the passing of time or the assumption of the committee's main functions by another entity within the Federal Government; or the agency determines that the cost of operation is excessive in relation to the benefits accruing to the Federal Government;

(c) An advisory committee shall be balanced in its membership in terms of the points of view represented, and the functions to be performed; and

(d) An advisory committee shall be open to the public in its meetings except in those circumstances where a closed meeting shall be determined proper and consistent with the provisions in the Government in the Sunshine Act, 5 U.S.C. 552(b).

§ 101-6.1003 Definitions.

"Act" means the Federal Advisory Committee Act, as amended, 5 U.S.C., App.

"Administrator" means the Administrator of General Services.

"Advisory committee" subject to the Act means any committee, board, commission, council, conference, panel, task force, or other similar group, or any subcommittee or other subgroup thereof, which is established by statute, or established or utilized by the President or any agency official for the purpose of obtaining advice or recommendations on issues or policies which are within the scope of his or her responsibilities.

"Agency" has the same meaning as in section 551(1) of Title 5 of the United States Code.

"Committee Management Secretariat" ("Secretariat"), established pursuant to the Act is responsible for all matters relating to advisory committees, and carries out the Administrator's responsibilities under the Act and Executive Order 12024.

"Committee member" means an individual who serves by appointment on an advisory committee and has the

full right and obligation to participate in the activities of the committee, including voting on committee recommendations.

"Presidential advisory committee" means any advisory committee which advises the President. It may be established by the President or by the Congress, or used by the President in the interest of obtaining advice or recommendations for the President. "Independent Presidential advisory committee" means any Presidential advisory committee not assigned by the President, or the President's delegate, or by the Congress in law, to an agency for administrative and other support and for which the Administrator of General Services may provide administrative and other support on a reimbursable basis.

"Staff member" means any individual who serves in a support capacity to an advisory committee.

"Utilized" (or "used"), as referenced in the definition of "Advisory committee" in this section, means a committee or other group composed in whole or in part of other than full-time officers or employees of the Federal Government with an established existence outside the agency seeking its advice which the President or agency official(s) adopts, such as through institutional arrangements, as a preferred source from which to obtain advice or recommendations on a specific issue or policy within the scope of his or her responsibilities in the same manner as that individual would obtain advice or recommendations from an established advisory committee.

§ 101-6.1004 Examples of advisory meetings or groups not covered by the Act or this subpart.

The following are examples of advisory meetings or groups not covered by the Act or this subpart:

- (a) Any committee composed wholly of full-time officers or employees of the Federal Government;
- (b) Any advisory committee specifically exempted by an Act of Congress;
- (c) Any advisory committee established or utilized by the Central Intelligence Agency;
- (d) Any advisory committee established or utilized by the Federal Reserve System;
- (e) The Advisory Committee on Intergovernmental Relations;
- (f) Any local civic group whose primary function is that of rendering a public service with respect to a Federal program, or any State or local committee, council, board, commission, or similar group established to advise or

make recommendations to State or local officials or agencies;

(g) Any committee which is established to perform primarily operational as opposed to advisory functions. Operational functions are those specifically provided by law, such as making or implementing Government decisions or policy. An operational committee may be covered by the Act if it becomes primarily advisory in nature. It is the responsibility of the administering agency to determine whether such a committee is primarily operational. If so, it would not fall under the requirements of the Act and this Subpart, but would continue to be regulated under relevant laws, subject to the direction of the President and the review of the appropriate legislative committees;

(h) Any meeting initiated by the President or one or more Federal official(s) for the purpose of obtaining advice or recommendations from one individual;

(i) Any meeting initiated by a Federal official(s) with more than one individual for the purpose of obtaining the advice of individual attendees and not for the purpose of utilizing the group to obtain consensus advice or recommendations. However, agencies should be aware that such a group would be covered by the Act when an agency accepts the group's deliberations as a source of consensus advice or recommendations;

(j) Any meeting initiated by a group with the President or one or more Federal official(s) for the purpose of expressing the group's view, provided that the President or Federal official(s) does not use the group recurrently as a preferred source of advice or recommendations;

(k) Meetings of two or more advisory committee or subcommittee members convened solely to gather information or conduct research for a chartered advisory committee, to analyze relevant issues and facts, or to draft proposed position papers for deliberation by the advisory committee or a subcommittee of the advisory committee; or

(l) Any meeting with a group initiated by the President or one or more Federal official(s) for the purpose of exchanging facts or information.

§ 101-6.1005 Authorities for establishment of advisory committees.

An advisory committee may be established in one of four ways:

- (a) By law where the Congress specifically directs the President or an agency to establish it;
- (b) By law where the Congress authorizes but does not direct the President or an agency to establish it. In

this instance, the responsible agency head shall follow the procedures provided in § 101-6.1007;

(c) By the President by Executive Order; or

(d) By an agency under general agency authority in Title 5 of the United States Code or under other general agency-authorizing law. In this instance, an agency head shall follow the procedures provided in § 101-6.1007.

§ 101-6.1006 [Reserved]

§ 101-6.1007 Agency procedures for establishing advisory committees.

(a) When an agency head decides that it is necessary to establish a committee, the agency must consider the functions of similar committees in the same agency before submitting a consultation to GSA to ensure that no duplication of effort will occur.

(b) In establishing or utilizing an advisory committee, the head of an agency or designee shall comply with the Act and this subpart, and shall:

(1) Prepare a proposed charter for the committee which includes the information listed in section 9(c) of the Act; and

(2) Submit a letter and the proposed charter to the Secretariat proposing to establish or use, reestablish, or renew an advisory committee. The letter shall include the following information:

(i) An explanation of why the committee is essential to the conduct of agency business and in the public interest;

(ii) An explanation of why the committee's functions cannot be performed by the agency, another existing advisory committee of the agency, or other means such as a public hearing; and

(iii) A description of the agency's plan to attain balanced membership. For purposes of attaining balance, agencies shall consider for membership interested persons and groups with professional or personal qualifications or experience to contribute to the functions and tasks to be performed. This should be construed neither to limit the participation, nor compel the selection of any particular individual or group to obtain divergent points of view that are relevant to the business of the advisory committee.

(3) Subcommittees that do not function independently of the full or parent advisory committee need not follow the requirements of paragraphs (b)(1) and (b)(2) of this section. However, they are subject to all other requirements of the Act.

(4) The requirements of paragraphs (b)(1) and (b)(2) of this section shall apply for any subcommittee of a chartered advisory committee, whether its members are drawn in whole or in part from the full or parent advisory committee, which functions independently of the parent advisory committee such as by making recommendations directly to the agency rather than for consideration by the chartered advisory committee.

(c) The Secretariat will review the proposal and notify the agency of GSA's views within 15 calendar days of receipt, if possible. The agency head retains final authority for establishing a particular advisory committee.

(d) The agency shall notify the Secretariat in writing that either:

(1) The advisory committee is being established. The filing of the advisory committee charter as specified in § 101-6.1013 shall be considered appropriate written notification in this instance. The date of filing constitutes the date of establishment or renewal. The agency head shall then comply with the provisions of § 101-6.1009 for an established advisory committee; or

(2) The advisory committee is not being established. In this instance, the agency shall also advise the Secretariat if the agency head intends to take any further action with respect to the proposed advisory committee.

§ 101-6.1008 The role of GSA.

(a) The functions under section 7 of the Act will be performed for the Administrator by the Secretariat. The Secretariat assists the Administrator in prescribing administrative guidelines and management controls for advisory committees, and assists other agencies in implementing and interpreting these guidelines. In exercising internal controls over the management and supervision of the operations and procedures vested in each agency by section 8(b) of the Act and by § 101-6.1009 and § 101-6.1017 of this rule, agencies shall conform to the guidelines prescribed by GSA.

(b) The Secretariat may request comments from agencies on management guidelines and policy issues of broad interagency interest or application to the Federal advisory committee program.

(c) In advance of issuing informal guidelines, nonstatutory reporting requirements, and administrative procedures such as report formats or automation, the Secretariat shall request formal or informal comments from Agency Committee Management Officers.

§ 101-6.1009 Responsibilities of any agency head.

The head of each agency that uses one or more advisory committees shall ensure:

(a) Compliance with the Act and this subpart;

(b) Issuance of administrative guidelines and management controls which apply to all advisory committees established or used by the agency;

(c) Designation of a Committee Management Officer who shall carry out the functions specified in section 8(b) of the Act;

(d) Provision of a written determination stating the reasons for closing any advisory committee meeting to the public;

(e) A review, at least annually, of the need to continue each existing advisory committees, consistent with the public interest and the purpose of functions of each committee;

(f) Rates of pay are justified and levels of agency support are adequate;

(g) The appointment of a Designated Federal Officer for each advisory committee and its subcommittees;

(h) The opportunity for reasonable public participation in advisory committee activities; and

(i) That the number of committee members is limited to the fewest necessary to accomplish committee objectives.

§ 101-6.1010 (Reserved)

§ 101-6.1011 Responsibilities of the chairperson of an independent Presidential advisory committee.

The chairperson of an independent Presidential advisory committee shall comply with the Act and this subpart and shall:

(a) Consult with the Administrator concerning the role of the Designated Federal Officer and Committee Management Officer; and

(b) Fulfill the responsibilities of an agency head as specified in paragraphs (d) and (h) of § 101-6.1009.

§ 101-6.1012 (Reserved)

§ 101-6.1013 Charter filing requirements.

No advisory committee may operate, meet, or take any action until its charter has been filed as follows:

(a) *Advisory committee established, used, reestablished, or renewed by an agency.* The agency head shall file—

(1) The charter with the standing committees of the Senate and the House of Representatives having legislative jurisdiction of the agency;

(2) A copy of the filed charter with the Library of Congress, Exchange and Gift Division, Federal Documents Section,

Federal Advisory Committee Desk, Washington, DC 20540; and

(3) A copy of the charter indicating the Congressional filing date, with the Secretariat.

(b) *Advisory committee specifically directed by law or authorized by law.* Procedures are the same as in paragraph (a) of this section.

(c) *Presidential advisory committee.*

When either the President or the Congress establishes an advisory committee that advises the President, the responsible agency head or, in the case of an independent Presidential advisory committee, the President's designee shall file—

(1) The charter with the Secretariat;

(2) A copy of the filed charter with the Library of Congress; and

(3) If specifically directed by law, a copy of the charter indicating its date of filing with the Secretariat, with the standing committees on the Senate and the House of Representatives having legislative jurisdiction of the agency or the independent Presidential advisory committee.

§ 101-6.1014 (Reserved)

§ 101-6.1015 Advisory committee information which must be published in the Federal Register.

(a) *Committee establishment, reestablishment, or renewal.* (1) A notice in the Federal Register is required when an advisory committee, except a committee specifically directed by law or established by the President by Executive Order, is established, used, reestablished, or renewed. Upon receiving notification of the completed review from the Secretariat in accordance with paragraph (c) of § 101-6.1007, the agency shall publish a notice in the Federal Register that the committee is being established, used, reestablished, or renewed. For a new committee, such notice shall also include statements describing the nature and purpose of the committee and that the committee is necessary and in the public interest.

(2) Establishment and reestablishment notices shall appear at least 15 calendar days before the committee charter is filed, except that the Secretariat may approve less than 15 days when requested by the agency for good cause. The 15-day advance notice requirement does not apply to committee renewals, notices of which may be published concurrently with the filing of the charter.

(b) *Committee meetings.* (1) The agency or an independent Presidential advisory committee shall publish at least 15 calendar days prior to an

advisory committee meeting a notice in the Federal Register, which includes:

(i) The exact name of the advisory committee as chartered;

(ii) The time, date, place, and purpose of the meeting;

(iii) A summary of the agenda; and

(iv) A statement whether all or part of the meeting is open to the public or closed, and if closed, the reasons why, citing the specific exemptions of the Government in the Sunshine Act (5 U.S.C. 552(b)) as the basis for closure.

(2) In exceptional circumstances, the agency or an independent Presidential advisory committee may give less than 15 days notice, provided that the reasons for doing so are included in the committee meeting notice published in the Federal Register.

§ 101-6.1016. [Reserved]

§ 101-6.1017 Responsibilities of the agency Committee Management Officer.

In addition to implementing the provisions of section 8(b) of the Act, the Committee Management Officer will carry out all responsibilities delegated by the agency head. The Committee Management Officer should also ensure that section 10(b), 12(a) and 13 of the Act are implemented by the agency to provide for appropriate recordkeeping. Records include, but are not limited to:

(a) A set of approved charters and membership lists for each advisory committee;

(b) Copies of the agency's portion of the Annual Report of Federal Advisory Committees required by paragraph (b) of § 101-6.1035;

(c) Agency guidelines on committee management operations and procedures as maintained and updated; and

(d) Agency determinations to close advisory committee meetings as required by paragraph (c) of § 101-6.1023.

§ 101-6.1018 [Reserved]

§ 101-6.1019 Duties of the Designated Federal Officer.

The agency head or, in the case of an independent Presidential advisory committee, the Administrator shall designate a Federal officer or employee, who may be either full-time or permanent part-time, to be the Designated Federal Officer for each advisory committee and its subcommittees, who:

(a) Must approve or call the meeting of the advisory committee;

(b) Must approve the agenda;

(c) Must attend the meetings;

(d) Shall adjourn the meetings when such adjournment is in the public interest; and

(e) Chairs the meeting when so directed by the agency head.

(f) The requirement in paragraph (b) of this section does not apply to a Presidential advisory committee.

§ 101-6.1020 [Reserved]

§ 101-6.1021 Public participation in advisory committee meetings.

The agency head, or the chairperson of an independent Presidential advisory committee, shall ensure that—

(a) Each advisory committee meeting is held at a reasonable time and in a place reasonably accessible to the public;

(b) The meeting room size is sufficient to accommodate advisory committee members, committee or agency staff, and interested members of the public;

(c) Any member of the public is permitted to file a written statement with the advisory committee; and

(d) Any member of the public may speak at the advisory committee meeting if the agency's guidelines so permit.

§ 101-6.1022 [Reserved]

§ 101-6.1023 Procedures for closing an advisory committee meeting.

(a) To close all or part of a meeting, an advisory committee shall submit a request to the agency head or, in the case of an independent Presidential advisory committee, the Administrator, citing the specific provisions of the Government in the Sunshine Act (5 U.S.C. 552(b)) which justify the closure. The request shall provide the agency head or the Administrator sufficient time to review the matter in order to make a determination prior to publication of the meeting notice required by § 101-6.1015(b).

(b) The general counsel of the agency or, in the case of an independent Presidential advisory committee, the general counsel of the General Services Administration should review all requests to close meetings.

(c) If the agency head or, in the case of an independent Presidential advisory committee, the Administrator agrees that the request is consistent with the provisions in the Government in the Sunshine Act and the Federal Advisory Committee Act, he or she shall issue a determination that all or part of the meeting be closed.

(d) The agency head, or the chairperson of an independent Presidential advisory committee, shall:

(1) Make a copy of the determination available to the public upon request; and

(2) State the reasons why all or part of the meeting is closed, citing the specific exemptions used from the Government

in the Sunshine Act in the meeting notice published in the Federal Register.

§ 101-6.1024 [Reserved]

§ 101-6.1025 Requirement for maintaining minutes of advisory committee meetings.

(a) The agency head or, in the case of an independent Presidential advisory committee, the chairperson shall ensure that detailed minutes of each advisory committee meeting are kept. The minutes must include:

(1) Time, date, and place;

(2) A list of the following persons who were present:

(i) Advisory committee members and staff;

(ii) Agency employees; and

(iii) Members of the public who presented oral or written statements;

(3) An estimated number of other members of the public present;

(4) An accurate description of each matter discussed and the resolution, if any, made by the committee of such matter; and

(5) Copies of each report or other document received, issued, or approved by the committee.

(b) The chairperson of each advisory committee shall certify to the accuracy of all minutes of advisory committee meetings.

§ 101-6.1026 [Reserved]

§ 101-6.1027 Termination of advisory committees.

(a) Any advisory committee shall automatically terminate not later than 2 years after it is established, reestablished, or renewed, unless:

(1) Its duration is otherwise provided for by law;

(2) The President or agency head renews it prior to the end of such period; or

(3) The President or agency head terminates it before that time by revoking or abolishing its establishment authority.

(b) If an agency head terminates an advisory committee, the agency shall notify the Secretariat of the effective date of termination.

§ 101-6.1028 [Reserved]

§ 101-6.1029 Renewal and rechartering of advisory committees.

(a) Advisory committees specifically directed by law:

(1) Whose duration extends beyond 2 years shall require rechartering by the filing of a new charter every 2 years after the date of enactment of the law establishing the committee. If a new charter is not filed, the committee is not

terminated, but may not meet or take any action.

(2) Which would terminate under the provisions of section 14 of the Act, and for which renewal would require reauthorization by law, may be reestablished by an agency provided that the agency complies under general agency authority with the provisions of § 101-6.1007.

(b) Advisory committees established by the President may be renewed by appropriate action of the President and the filing of a new charter.

(c) Advisory committees authorized by law or established or used by an agency may be renewed, provided that at least 30 but not more than 60 days before the committee terminates, an agency head who intends to renew a committee complies with the provisions of § 101-6.1007.

§ 101-6.1030 [Reserved]

§ 101-6.1031 Amendments to advisory committee charters.

(a) *Committees specifically directed by law or authorized by law; or established by the President.* The agency head shall be responsible for ensuring that any minor technical changes made to current charters are consistent with the relevant statute or Executive Order. When the Congress by law, or the President by Executive Order, changes the authorizing language which has been the basis for establishing an advisory committee, the agency head, or the chairperson of an independent Presidential advisory committee, shall:

(1) Amend those sections of the current charter affected by the new law or Executive Order; and

(2) File the amended charter as specified in § 101-6.1013.

(b) *Committees established or used by an agency.* The charter of an advisory committee established under general agency authority may be amended when an agency head determines that the existing charter no longer accurately reflects the objectives or functions of the committee. Changes may be minor, such as revising the name of the advisory committee, or modifying the estimated number or frequency of meetings.

Changes may also be major such as those dealing with the objectives or composition of the committee. The agency head retains final authority for amending the charter of an advisory committee. Amending any existing advisory committee charter does not constitute renewal of the committee under § 101-6.1029.

(1) To make a minor amendment to a committee charter, an agency shall:

(i) Amend the charter language as necessary, and

(ii) File the amended charter as specified in § 101-6.1013.

(2) To make a major amendment to a committee charter, an agency shall:

(i) Amend the charter language as necessary;

(ii) Submit the proposed amended charter with a letter to the Secretariat requesting GSA's views on the amended language, along with an explanation of the purpose of the changes and why they are necessary. The Secretariat will review the proposed changes and notify the agency of GSA's views within 15 calendar days of the request, if possible; and

(iii) File the amended charter as specified in § 101-6.1013.

§ 101-6.1032 [Reserved]

§ 101-6.1033 Compensation and expense reimbursement of advisory committee members, staffs and consultants.

(a) *Uniform pay guidelines for members of an advisory committee.* Nothing in this subpart shall require an agency head to provide compensation, unless otherwise provided by law, to a member of an advisory committee. However, when compensation is deemed appropriate by an agency, it shall fix the pay of the members of an advisory committee to the daily equivalent of a rate of the General Schedule in 5 U.S.C. 5332 unless the members are appointed as consultants and compensated under 5 U.S.C. 3109. In determining an appropriate rate of pay for the members, an agency shall give consideration to the significance, scope, and technical complexity of the matters with which the advisory committee is concerned and the qualifications required of the members of the advisory committee. An agency may not fix the pay of the members of an advisory committee at a rate higher than the daily equivalent of the maximum rate for a GS-15 under the General Schedule, unless a higher rate is mandated by statute, or the head of the agency has personally determined that a higher rate of pay under the General Schedule is justified and necessary. Such a determination must be reviewed by the head of the agency annually. Under this subpart, an agency may not fix the pay of the members of an advisory committee at a rate of pay higher than the daily equivalent of a rate for a GS-18, as provided in 5 U.S.C. 5332.

(b) *Pay for staff members of an advisory committee.* An agency may fix the pay of each advisory committee staff member at a rate of the General Schedule in which the Staff member's

position would appropriately be placed (5 U.S.C. Chapter 51). An agency may not fix the pay of a staff member at a rate higher than the daily equivalent of the maximum rate for GS-15, unless the agency head has determined that under the General Schedule the staff member's position would appropriately be placed at a grade higher than GS-15. This determination must be reviewed annually by the agency head.

(1) In establishing rates of compensation, the agency head shall comply with any applicable statutes, regulations, Executive Orders, and administrative guidelines.

(2) A staff member who is a Federal employee shall serve with the knowledge of the Designated Federal Officer and the approval of the employee's direct supervisor. If a non-Federal employee, the staff member shall be appointed in accordance with applicable agency procedures, following consultation with the advisory committee.

(c) *Pay for consultants to an advisory committee.* An agency shall fix the pay of a consultant to an advisory committee after giving consideration to the qualifications required of the consultant and the significance, scope, and technical complexity of the work. The compensation may not exceed the maximum rate of pay authorized by 5 U.S.C. 3109, and shall be in accordance with any applicable statutes, regulations, Executive Orders and administrative guidelines.

(d) *Gratuitous services.* In the absence of any special limitations applicable to a specific agency, nothing in this subpart shall prevent an agency from accepting the gratuitous services of an advisory committee member, staff member, or consultant who agrees in advance to serve without compensation.

(e) *Travel expenses.* Advisory committee members and staff members, while engaged in the performance of their duties away from their homes or regular places of business, may be allowed travel expenses, including per diem in lieu of subsistence, as authorized by section 5703 of Title 5, United States Code, for persons employed intermittently in the Government service.

(f) *Services for handicapped members.* While performing advisory committee duties, an advisory committee member who is blind or deaf or who qualifies as a handicapped individual may be provided services by a personal assistant for handicapped employees if the member:

(1) Qualifies as a handicapped individual as defined by section 501 of

the Rehabilitation Act of 1973 (29 U.S.C. 794); and

(2) Does not otherwise qualify for assistance under 5 U.S.C. 3102 by reason of being an employee of an agency.

(g) *Exclusions.* (1) Nothing in this section shall prevent any person who (without regard to his or her service with an advisory committee) is a full-time Federal employee from receiving compensation at a rate which he or she otherwise would be compensated as a full-time Federal employee.

(2) Nothing in this section shall prevent any person who immediately before his or her service with an advisory committee was a full-time Federal employee from receiving compensation at the rate at which he or she was compensated as a full-time Federal employee.

(3) Nothing in this section shall affect a rate of pay or a limitation on a rate of pay that is specifically established by law or a rate of pay established under the General Schedule classification and

pay system in chapter 51 and chapter 53 of Title 5, United States Code.

§ 101-6.1034 [Reserved]

§ 101-6.1035 Reports required for advisory committees.

(a) Within one year after a Presidential advisory committee has submitted a public report to the President, the President or his delegate will prepare a follow-up report to the Congress detailing the disposition of the committee's recommendations in accordance with section 6(b) of the Act.

(b) The President's annual report to the Congress shall be prepared by GSA based on reports filed on a fiscal year basis by each agency consistent with the information specified in section 6(c) of the Act. Reports from agencies shall be consistent with instructions provided annually by the Secretariat. This report has been cleared in accordance with FIRM 201-45.6 in 41 CFR Chapter 201 and assigned interagency report control number 0304-GSA-XX.

(c) In accordance with section 10(d) of the Act, advisory committees holding closed meetings shall issue reports at least annually, setting forth a summary of activities consistent with the policy of Section 552(b) of Title 5, United States Code.

(d) Subject to section 552 of Title 5, United States Code, eight copies of each report made by an advisory committee, including any report on closed meetings as specified in paragraph (c) of this section, and, where appropriate, background papers prepared by consultants, shall be filed with the Library of Congress as required by section 13 of the Act, for public inspection and use at the location specified in paragraph (a)(2) of § 101-6.1013.

Dated: November 24, 1987.

T.C. Golden,

Administrator of General Services.

[FR Doc. 87-27776 Filed 12-1-87; 8:45 am]

BILLING CODE 6820-34-M

**GENERAL SERVICES
ADMINISTRATION**

41 CFR Part 101-6

(FPMR Amdt. A-48)

**Federal Advisory Committee
Management**

AGENCY: Office of Administration, GSA.
ACTION: Final rule.

SUMMARY: This final rule provides additional administrative and interpretive guidelines and management controls for Federal agencies concerning the implementation of the Federal Advisory Committee Act, as amended (5 U.S.C., App.) (hereinafter "the Act"). In a previous issue of the Federal Register, GSA published an initial final rule on the management of Federal advisory committees (52 FR 45928, December 2, 1987). This new final rule revises the current rule to improve further the management and use of Federal advisory committees in the Executive Branch of the Federal Government. These revisions: (1) Clarify the guidelines applicable to achieving committee memberships which are balanced in a way that is fair and consistent with section 5(b) of the Act; (2) add new language which cross-references regulations relating to Federal conflict-of-interest statutes and standards of conduct within the final rule; (3) clarify the procedures for transmitting follow-up reports to the Congress as required by section 6(b) of the Act on Presidential advisory committee recommendations; and (4) provide that annual agency fiscal year reports to GSA shall also include information requested to carry out the annual comprehensive review required by section 7(b) of the Act. Corrections of minor, nonsubstantive errors in the text of the original final rule have also been made.

EFFECTIVE DATE: October 5, 1989.

ADDRESSES: General Services Administration, Committee Management Secretariat (CTM), Washington, DC 20405.

Copies of the two comments received are available for public inspection in Room 8208 of the General Services Building, 18th and F Streets, NW., Washington, DC.

FOR FURTHER INFORMATION CONTACT: Charles F. Howton, Senior Committee Management Specialist, Committee Management Secretariat, Office of Management Services, Office of Administration, General Services Administration, Washington, DC 20405 (202) 523-4864.

SUPPLEMENTARY INFORMATION:

Background

GSA's authority for administering the Act is contained in section 7 of the Act and Executive Order 12024 (42 FR 81445, 3 CFR, 1977 Comp., p. 158). Under Executive Order 12024, the President delegated to the Administrator of General Services all of the functions vested in the President by the Act, as amended, except that the Annual Report to the Congress required by section 6(c) shall be prepared by the Administrator for the President's consideration and transmittal to the Congress.

Discussion of Comments

GSA published a notice of proposed rulemaking in the Federal Register on the management of Federal advisory committees, with a 60-day comment period ending on February 28, 1989 (53 FR 53022, December 30, 1988). No Federal agency submitted substantive recommendations. Two non-Federal commenters responded in writing and were highly supportive of the proposed rule, stating, for example, that "The proposed rule provides greater guidance to agencies . . ." and, that "The changes proposed by GSA . . . represent a major improvement over the existing rules." Both commenters offered suggestions for improving two sections of the proposed rule, both of which pertained to provisions relating to balanced membership of advisory committees. These comments discussed three recommendations made in relation to § 101-6.1007(b)(2)(iii) and to § 101-6.1015(a)(1) of the proposed rule. The disposition of these recommendations is addressed as follows:

Require that Agencies Include in Their Balanced Membership Plans a Description of Plans To Attain and Maintain Fairly Balanced Membership

One commenter stated that the final rule should require agencies to describe plans to maintain fairly balanced membership, since . . . "advisory committees undergo changes from the initial composition through routine membership rotations or the resignation and replacement of members." GSA agrees that advisory committees often have changing membership composition.

However, section 14(a)(2)(A) of the Act provides that advisory committees established by agencies shall terminate after two years unless renewed by appropriate action. In § 101-6.1029(c) of the original final rule, GSA requires that an agency head who intends to renew a committee comply with the provisions of § 101-6.1007 of the final rule duplicating procedures for establishment. The

renewing agency must provide a description of its plan to attain fairly balanced membership on a biennial basis and, therefore, must address at the time of renewal any changes to the composition of the committee which may have occurred since its establishment or last renewal. GSA recognizes the merit of this suggestion, but believes that the Act and existing rule already provide for agencies to accommodate the requirement for fairly balanced membership. GSA, therefore, has not adopted this recommendation.

Require that Agencies Consider and Select a Cross-Section of Certain Membership Categories

The other commenter was of the opinion that the language in the proposed rule requiring that an agency consider (only) certain categories of potential members seemed to suggest that . . . "so long as an agency has 'considered' a cross-section of views and interests in the course of putting a committee together, it can ultimately select any composition it wants," including one which is one-sided and imbalanced." GSA does not believe that the guidance provided in the rule necessarily will cause agencies to adopt this perceived course with regard to membership selection, leading to the results suggested by this commenter.

In any case, § 101-6.1015(a)(1) of the new final rule will now require the agency to publish in advance in the Federal Register its description of its plan to attain fairly balanced membership, allowing for public comments which could include those offered by any interested party who might disagree that the committee will be fairly balanced. Furthermore, since the eventual selection of members for the composition an advisory committee established under this provision rests with the agency head, GSA does not believe that the final rule can compel an agency to make any particular membership selection. GSA has, therefore, not adopted this recommendation.

Require that an Agency's Federal Register Notice of Establishment Solicit the Proposal of Specific Nominees for Inclusion on a Committee

With regard to the Federal Register notice of establishment required by § 101-6.1015(a)(1) of the final rule, the previous commenter also suggested further that . . . "by requiring agencies to give the public an opportunity to comment on the plan for attaining fairly balanced membership, including by proposing specific nominees for

inclusion on the committee . . . (that) This would be invaluable to the public and would also be of great benefit to agencies, because it would ensure that they would have the most information possible about potential committee members."

For the following reasons, GSA has not adopted this suggestion. First, a notice of establishment normally contains the name and telephone number of the agency official responsible for responding to questions from, or for receiving comments provided by, any interested person. Such comments can include proposals for specific nominees for membership on a committee. Second, notices of establishment frequently are published by an agency prior to the selection of members, and the agency would have the opportunity to consider the commenter's suggestions of potential members. Even if an agency has chosen the members of a committee prior to the publication of the notice, it can make changes to the membership at any time during the life of the committee. Third, GSA is of the opinion that the overall purpose of the Federal Register notice of establishment, which in accordance with § 101-6.1015(a)(2) of the final rule shall appear at least 15 days before the filing of the committee's charter, is to provide the public an opportunity to comment on the necessity or any other aspect of the proposed committee.

Additional Information

The guidelines contained in this final rule with respect to § 101-6.1008(d), wherein GSA may solicit the assistance of the Office of Management and Budget in assuring the completion of follow-up reports required by section 6(b) of the Act, were developed by GSA after consultation with that agency.

Similarly, the guidelines contained in this final rule with respect to § 101-6.1009(j), wherein an agency head shall ensure that the interests and affiliations of advisory committee members are reviewed consistent with regulations published by the Office of Government Ethics, were developed by GSA after consultation with that agency.

Executive Order 12291

GSA has determined that this final rule is not a major rule for the purposes of Executive Order 12291 of February 17, 1981, because it will not result in an annual effect on the economy of \$100 million or more, will not cause a major increase in costs to consumers or others, and will not have significant adverse effects. GSA has based all administrative decisions on this final rule on adequate information concerning

the need for and consequences of this final rule. GSA has also determined that the potential benefits to society from this final rule far outweigh the potential costs, has maximized the net benefits, and has chosen the alternative involving the least cost to society.

Regulatory Flexibility Act

These regulations are not subject to the regulatory flexibility analysis or other requirements of 5 U.S.C. 603 and 604.

List of Subjects in 41 CFR Part 101-6

Civil Rights, Government property management, Grant programs, Intergovernmental relations, Surplus Government property, Relocation assistance, Real property acquisition, Federal advisory committees.

Accordingly, 41 CFR part 101-6 is amended as follows:

PART 101-6—MISCELLANEOUS REGULATIONS

1. The authority citation for 41 CFR part 101-6 continues to read as follows:

Authority: Sec. 205(c), 63 Stat. 390; 40 U.S.C. 486(c); sec. 7, 5 U.S.C., App.; and E.O. 12024, 3 CFR 1977 Comp., p. 158.

2. Section 101-6.1001 is amended by revising paragraph (a) to read as follows:

§ 101-6.1001 Scope.

(a) This subpart defines the policies, establishes minimum requirements, and provides guidance to agency management for the establishment, operation, administration, and duration of advisory committees subject to the Federal Advisory Committee Act, as amended. Reporting requirements which keep the Congress and the public informed of the number, purpose, membership activities, and cost of these advisory committees are also included.

3. Section 101-6.1002 is amended by revising paragraph (c) to read as follows:

§ 101-6.1002 Policy.

(c) An advisory committee shall be fairly balanced in its membership in terms of the points of view represented and the functions to be performed; and

4. Section 101-6.1007 is amended by revising the introductory text of paragraph (b)(2) and paragraph (b)(2)(iii) to read as follows:

§ 101-6.1007 Agency procedures for establishing advisory committees.

(b) . . .

(2) Submit a letter and the proposed charter to the Secretariat proposing to establish or use, reestablish, or renew an advisory committee. The letter shall include the following information:

(iii) A description of the agency's plan to attain fairly balanced membership. The plan will ensure that, in the selection of members for the committee, the agency will consider a cross-section of those directly affected, interested, and qualified, as appropriate to the nature and functions of the committee. Committees requiring technical expertise should include persons with demonstrated professional or personal qualifications and experience relevant to the functions and tasks to be performed.

5. Section 101-6.1008 is amended by adding paragraph (d) to read as follows:

§ 101-6.1008 The role of GSA.

(d) The Secretariat shall assure that follow-up reports required by section 6(b) of the Act are prepared and transmitted to the Congress as directed by the President; either by his delegate, by the agency responsible for providing support to a Presidential advisory committee, or by the responsible agency or organization designated pursuant to paragraph (c) of § 101-6.1011. In performing this function, GSA may solicit the assistance of the Office of Management and Budget and other appropriate organizations, as deemed appropriate.

6. Section 101-6.1009 is amended by revising paragraphs (e), (h) and (i); and by adding paragraphs (j) and (k) to read as follows:

§ 101-6.1009 Responsibilities of an agency head.

(e) A review, at least annually, of the need to continue each existing advisory committee, consistent with the public interest and the purpose and functions of each committee;

(h) The opportunity for reasonable public participation in advisory committee activities;

(i) That the number of committee members is limited to the fewest necessary to accomplish committee objectives;

(j) That the interests and affiliations of advisory committee members are reviewed consistent with regulations published by the Office of Government

Ethics in 5 CFR parts 734, 735, and 737, and additional requirements, if any.

established by the sponsoring agency pursuant to Executive Order 12674, the conflict-of-interest statutes, and the Ethics in Government Act of 1978, as amended; and

(k) Unless otherwise specified by the President, the preparation and transmittal of a follow-up report to the Congress detailing the disposition of the public recommendations of a Presidential advisory committee supported by the agency, in accordance with sections 6(b) of the Act.

7. Section 101-6.1011 is amended by revising paragraphs (a) and (b); and by adding paragraph (c) to read as follows:

§ 101-6.1011 Responsibilities of the chairperson of an independent Presidential advisory committee.

(a) Consult with the Administrator concerning the role of the Designated Federal Officer and Committee Management Officer;

(b) Fulfill the responsibilities of an agency head as specified in paragraphs (d), (h) and (j) of § 101-6.1009; and

(c) Unless otherwise specified by the President, consult with the Administrator regarding the designation of an agency or organization responsible for implementing section 6(b) of the Act.

8. Section 101-6.1015 is amended by

revising paragraph (a)(1) to read as follows:

§ 101-6.1015 Advisory committee information which must be published in the Federal Register.

(a) * * *

(1) A notice in the Federal Register is required when an advisory committee, except a committee specifically directed by law or established by the President by Executive Order, is established, used, reestablished, or renewed. Upon receiving notification of the completed review from the Secretariat in accordance with paragraph (c) of § 101-6.1007, the agency shall publish a notice in the Federal Register that the committee is being established, used, reestablished, or renewed. For a new committee, such notice shall also describe the nature and purpose of the committee and the agency's plan to attain fairly balanced membership, and shall include a statement that the committee is necessary and in the public interest.

9. Section 101-6.1035 is amended by revising paragraphs (a) and (b) to read as follows:

§ 101-6.1035 Reports required for advisory committees.

(a) Within one year after a Presidential advisory committee has submitted a public report to the

President, a follow-up report will be prepared and transmitted to the Congress as determined under paragraph (d) of § 101-6.1008, detailing the disposition of the committee's recommendations in accordance with section 6(b) of the Act. Reports shall be consistent with specific instructions issued periodically by the Secretariat;

(b) The President's annual report to the Congress shall be prepared by GSA based on reports filed on a fiscal year basis by each agency consistent with the information specified in section 6(c) of the Act. Reports from agencies shall be consistent with instructions provided annually by the Secretariat. Agency reports shall also include information requested to enable the Secretariat to carry out the annual comprehensive review of each advisory committee as required by section 7(b) of the Act. These reports have been cleared in accordance with FIRMR Subpart 201-45.6 in 41 CFR chapter 201 and assigned interagency report control number 0304-GSA-XX.

Dated: August 23, 1989.

Richard G. Austin,

Acting Administrator of General Services.
(FR Doc. 89-23455 Filed 10-4-89; 8:45 am)
BILLING CODE 6320-34-0

APPENDIX B: SANCTUARY DESIGNATION DOCUMENT AND REGULATIONS

Sanctuary Designation Document and Regulations

TO BE INSERTED AFTER FINAL REVIEW OF REGULATORY PACKAGE

APPENDIX C:

STATE AND FEDERAL AUTHORITIES APPLICABLE TO THE
MONTEREY BAY AREA

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I. State and Federal Authorities Applicable to the Monterey Bay Area

Introduction

Presented below is an overview of the various State and Federal management authorities which have statutory responsibility for protecting marine resources in the proposed Monterey Bay National Marine Sanctuary study area. This discussion includes a description of relevant legislative mandates as well as administrative measures taken to accomplish them.

II. State Authorities

The State's jurisdiction in the area under consideration extends 3nm (5.6 km) offshore from the mean high tide line. State authorities range in approach and scope from broad regional management programs such as the California Coastal Act to laws intended to control specific threats or protect specific resources. The authorities with broad jurisdiction are described first, followed by those addressing a specific threat or resource, respectively.

A recent initiative by the Governor of California (April, 1991) proposes to combine a number of existing agencies, and creates one new Board, into a new California Environmental Protection Agency, a new cabinet level agency designed to streamline and coordinate the state's environmental programs. The new agency will combine the Air Resources Board, that regulates automobile emissions and assists local governments in regulating air emissions from stationary sources; the Integrated Waste

Management Board, to help local governments meet waste reduction goals of 25 percent by 1995 and 50 percent by 2000; the State Water Quality Resources Control Board that governs state water rights and oversees state water pollution controls; the Department of Toxic Substances, that assess various methods for cleaning up toxics in the air, water and land; the Department of Pesticide Regulation, that sets, monitors and enforces the use of pesticides for agricultural purposes; and the Office of Environmental Health Hazard Assessment that ascertains the environmental risks from chemicals in the air, water, food, solid and hazardous waste, sediment and various consumer products.

A. The California Coastal Act of 1976 [Cal. Pub. Res. Code 30000 et seq.]

The California Coastal Act of 1976 (the CCA) is the foundation of the California Coastal Management Program. It establishes a comprehensive set of specific policies for the protection of coastal resources and the management of orderly economic development throughout the coastal zone. The CCA defines the coastal zone as the land and water area of the State, extending seaward to the outer limit of the State's jurisdiction (3.0 nm or 5.6 km), including all offshore islands), and extending inland generally 1,000 yards from the mean tide line. In significant coastal, estuarine, habitat, and recreational area, it extends inland to the first major ridge line or 5nm (8km) from the mean high tide, whichever is less.

Activities in State waters must comply with the policies established by the CCA. In addition, seaward of state jurisdiction Federal activities directly affecting the coastal zone must be conducted in a manner which is consistent with these policies to the maximum extent practicable and activities which require a federal license or permit must be conducted in a manner consistent with these policies (16 U.S.C. § 1456)

Provisions of the CCA which address activities or concerns relevant to the consideration of a marine sanctuary include:

- 1) Article 4, Section 30230 granting "special protection to" areas and species of special biological or economic significance and requiring uses of the marine environment to be carried out so as to maintain biological productivity.
- 2) Article 4, Section 30233 limiting dredging and filling in coastal waters to situations where "there is no feasible less environmentally damaging alternative" and the activities are related to specific listed purposes.
- 3) Article 5, Section 30240 protecting sensitive habitat areas against "any significant disruption of habitat values" and against impacts from adjacent development which would "significantly degrade" the area.
- 4) Article 7, Section 30262, regulating oil and gas development.

The CCA establishes the State Coastal Commission to implement the Act, granting it permit authority until such time as local

governments adopt local plans approved by the Commission. In marine areas the Commission will continue to be the State permitting agency and be responsible for reviewing consistency for Federal activities and Federally licensed activities including OCS activities, which are of particular importance to the area under consideration. Local governments with jurisdiction over areas affected by OCS activity are invited by the CCC to participate in the public hearing process, and CCC deliberations, and to present determinations of whether OCS activity is consistent with the local coastal plan. Local coastal plans are presently being prepared throughout the study area. Most of the counties and cities within the study area have fully certified local coastal plans. These include San Mateo, Santa Cruz and Monterey Counties, and Santa Cruz, Capitola, Watsonville, Marina, and Sand City. Communities still requiring certification for portions of their plans include Seaside, Monterey, Pacific Grove and Carmel.

To facilitate early containment of an oil spill, the CCC has required one lease holder (Exxon, for exploratory drilling on certain tracts in the Santa Barbara Channel) to have certain minimum oil spill containment and cleanup equipment on drillships or at the site at all times, e.g.,: 1) 1500 feet of open ocean containment boom and a boat capable of deploying the boom, 2) one oil skimming device capable of open use, and 3) fifteen bales of oil sorbent material. Also, the CCC has determined that, for reasons of navigation safety and environmental protection, the placement of drillships in or within 500 meters of sea lanes

established by the U.S. Coast Guard is inconsistent with the Coastal Plan.

With regard to public trust lands, i.e. State tidelands and submerged lands, a significant role is also played by the State Lands Commission (SLC). Prior to certification, the SLC may review and comment on any aspect of a proposed Local Coastal Plan that could affect State lands (Cal. Pub. Res. Code § 30415). In addition, as the State agency with sole responsibility for administering the trust, the SLC has adopted regulations for the protection and use of public trust lands in the coastal zone.

The CCA also requires that diking, filling or dredging in open coastal waters, wetlands, or estuaries shall be permitted only for certain listed purposes, and only where there is no feasible less environmentally damaging alternative, and where mitigation measures have been provided (California Coastal Act §30233). Finally the CCA requires the CCC to designate "Sensitive Coastal Resource Areas", which must then be acted upon by the Legislature within two years.

In addition, recent amendments to the Coastal Zone Management Act require the CCC to prepare and submit, in coordination with the State Water Quality Resources Control Board, to the Administrator of EPA and the Secretary of Commerce for approval a Coastal Non-point Pollution Control Program.

B. California Environmental Protection Agency

California State Environmental Protection Agency was created

by Governor Wilson in April 1991 to streamline and coordinate the state's environmental programs. The new Agency creates an Office of the Secretary which serves as the primary point of accountability, reporting directly to the Governor, for the management of environmental programs and brings together the functions which cut across the various programs designed to address pollution in a specific medium, e.g., air, surface water, ground water, land disposal, ocean disposal, etc.

It specifically, incorporates the following State Environmental Agencies: (1) The Air Resources Board, (2) the Integrated Waste Management Board, (3) The State Water Quality Resources Control Board, (4) The Department of Toxic Substances Control (including the Toxic Substances Control Program), (5) The Department of Pesticide Regulation and, (6) The Office of Environmental Health Hazard Assessment.

C. Water Quality Control Act (California Water Code §13300 et seq.)

The Porter-Cologne Water Quality Control Act is designed to enhance and maintain water quality in State waters, including ocean waters, under the jurisdiction of the state. The State Water Resource Control Board and the nine regional water quality control boards have primary authority for regulating water quality in California.

The Water Quality Control Plan for Oceans Waters of California (1988), which set standards for water quality characteristics for

ocean waters within state jurisdiction, places particular emphasis on maintaining water quality in Areas of Special Biological Significance (ASBSs). To be classified as an ASBS, an area of ocean water must be considered to contain biological communities of such extraordinary value that no risk of change in their environments resulting from man's activities is considered acceptable (California Water Resources Control Board, 1988). Wastes must be discharged a sufficient distance from designated ASBSs to ensure that natural water quality conditions within the area are maintained. This is accomplished (i.e., administered) by Regional Water Quality Control Boards (RWQCBs) which, via a permit procedure, set waste discharge restrictions upon:

- a) elevated temperature wastes;
- b) discrete, point source or industrial process wastes; and
- c) non-point source wastes such as, but not limited to, storm water runoff, silt, and urban runoff.

ASBS designations have no impact on vessel wastes, dredging control, or dredge spoil deposition because the California Ocean Plan, of which ASBSs are a part, is not applicable to those activities.

Finally the SWRCB, responsible for developing part of a joint Coastal Non-Point Source Program, in cooperation with the CCC (§ 6217, CZMA) (in conjunction with Regional Boards) and submitting the program for approval to the Administrator of EPA and the Secretary of Commerce.

D. Fish and Game Code

The California Department of Fish and Game, under the Fish and Game Code (and Chapter 14 of the Administrative Code), regulates and manages a wide variety of activities affecting the fish and game resources found on the land and in water areas under state jurisdiction. The Department of Fish and Game programs can be placed into four categories: 1) enhancement of environmental quality necessary for the maintenance of fish and game resources, 2) habitat protection through both regulations and property ownership, 3) prohibition of activities which may cause direct harm to individual species, and 4) management of fish and game stocks for commercial and recreational use. Specific programs of relevance to the study area other than ecological reserves (discussed above) are regulation of sport and commercial fishing, protection of endangered species, protection of migratory birds, and coordination of the oil spill contingency plans.

1. Regulations of Sport and Commercial Fishing

The Department of Fish and Game regulates sport fishing through license and bag limit systems. A sport fishing license is required for the taking and possession of fish for any non-commercial purpose (California Fish and Game Code §7100).

Commercial fishing, including the taking of tidal invertebrates for commercial purpose, is also governed by a licensing system. Certain species found in the study area are

protected from commercial take; all other species may be taken in season (California Fish and Game Code §8140). Species found in the study area include: striped bass, kelp bass, sand bass, spotted bass, yellowfin croaker, spotfin croaker, sturgeon and California corbina (California Fish and Game Code §§8370-8373). The above species are reserved for recreation taking only. Several other species are subject to minimum size, seasonal and volume limitations.

Every person who operates or assists in using any boat or gear to take fish for profit must procure a license (California Fish and Game Code §7580); party boat operators must get special licenses (California Fish and Game Code §7920 et seq.). Vessels used in commercial fishing operations must also carry a Department of Fish and Game registration number (California Fish and Game Code §7880). Fishing reports, described in Section 8010 et seq., must be supplied by buyers, processors, and anyone else who receives fish from fishermen. These reports form the basis of Department of Fish and Game statistics used in formulating fishery management policies.

Licenses must also be obtained by any person engaged in the business of mariculture (California Fish and Game Code § 6480) or oyster culture (California Fish and Game Code § 6510). State water bottoms may be leased for this purpose by the Fish and Game Commission.

Under the Submerged Lands Act of 1953 [43 USC § 130(c) et seq.], California has jurisdiction over kelp within state waters as

a seabed resource. A license is required to harvest kelp for profit (California Fish and Game Code §6650). As with other commercial fisheries, a record book must be maintained (California Fish and Game Code §6652). The Department of Fish and Game retains the power to close any kelp beds if harvesting results in destroyed or impaired beds (California Fish and Game Code §6654).

2. Endangered Species (California Fish and Game Code §2050 et seq.)

The California Department of Fish and Game maintains a list of endangered and threatened species. It is unlawful within the state to take or possess any listed species. "Taking" is defined (California Fish and Game Code §2050 et seq.) in a manner analogous to the interpretation under the federal act (see below). Listed species found in the study area are the California Clapper Rail, California brown pelican, the California Least tern, the light-footed clapper rail, and the Southern sea otter.

3. Protection of Migratory Birds (California Fish and Game Code §355 et seq. and 3500 et seq.)

In accordance with the Migratory Bird Treaty Act, California has provided protection for migratory birds, their nests and eggs by fixing areas, seasons, and hours plus bag and possession limits by species for migratory game birds (California Fish and Game Code §356). Of the birds found in the study area, the peregrine falcon, brown pelican, California clapper rail, California least tern,

light-footed clapper rail and Southern bald eagle (California Fish and Game Code §3511) have all been accorded "fully protected" status, which protects these birds from taking except as authorized for scientific research.

4. Oil Spill Contingency Plans California Fish and Game Code §5650 et seq.)

It is unlawful to "Deposit or permit any petroleum to pass into the waters of the state" (California Fish and Game §5650). The California Department of Fish and Game together with an Interagency Committee coordinates the state's oil spill contingency plan. Because federal law preempts state regulations of oil spill cleanup operations, the state's role is that of observer, assistant, and advisor--with the important exception that the state has veto power over the use of chemical agents in state waters. In practice, State Department of Fish and Game personnel: 1) investigate all spills in state waters and many spills in federal waters; 2) monitor, assist, and advise federal and industry cleanup operations; and 3) maintain liaison between various government agencies and industry.

E. SB 2040, The Lempert-Keene Oil Spill Prevention and Response Act, 1990

SB 2040 establishes a comprehensive oil spill response and prevention program for the State of California. The major provisions do the following:

1) Provides the Governor with the overall responsibility for oil spill response in the State.

2) Requires any person who causes an oil spill to begin an immediate cleanup, follow approved contingency plans, carry out the directions of the administrator, and fully mitigate for adverse impacts to wildlife.

This bill requires the Governor to appoint an administrator for oil spill response as a Chief Deputy Director in the Department of Fish and Game. The Administrator would:

- a) Develop an oil spill response training program;
- b) Study and evaluate dispersants, new oil spill response equipment and techniques, and determine use of dispersants;
- c) Conduct periodic drills to test oil spill response;
- d) Coordinate Federal, State and local planning and preparation for oil spill response;
- e) Negotiate with Alaska, Oregon, and Washington to develop an interstate compact regarding tanker safety and oil spill response and prevention;
- f) Insure that trained persons are at the scene of an oil spill as quickly as possible;
- g) Determine the cause of any spill; and
- h) Establish rescue and rehabilitation stations for wildlife.

SB 2040 is divided into two main categories: Prevention and Response. Prevention measures include:

- * Expanded oil tanker safety inspection programs
- * Comprehensive oil spill prevention plans required for all tankers

and terminals

- * Vessel traffic monitoring and surveillance program
- * Tugboat escorts in hazardous waters
- * Emergency stations along the coast for disabled tankers
- * Cease and Desist authority to enforce spill prevention measures
- * Prevention and response based on "Best Achievable Protection" standards.

Response measures include:

- * New State oil spill response unit
- * Mandates massive oil industry oil spill cleanup capability
- * \$100 million Emergency Fund for cleanup
- * Unlimited State borrowing authority for cleanup, funded by a 25 cent per barrel oil industry fee
- * Comprehensive oil spill cleanup plans for all tankers
- * Unlimited qualified immunity for "good samaritan" respondents to spills
- * 60 day qualified immunity, with possible 30 day extension for professional respondents to spills
- * Extensive wildlife rehabilitation programs
- * \$500 - \$1 billion mandatory financial assurance requirements for tankers.

By regulation, the State Interagency Oil Spill Committee (SIOSC) consisting of 18 State agencies, develops the State Oil Spill Contingency Plan. SB 2040 mandates additional representatives on the Committee and establishes the SIOSC review subcommittee (SRS) to review and make recommendations on

regulations drafted by the Administrator.

F. Cunningham-Shell Tidelands Act, as Amended (California Public Resources Code §6850 et seq.)

The State Lands Commission has jurisdiction over all state owned lands and State submerged lands extending to 3 nmi (5.6 km) from the mean high tide line. Administration of state lands includes leasing of these lands for various legislatively authorized purposes; in particular, oil and gas exploration and development. The Public Resources Code specifically requires that development of publicly owned mineral resources not be undertaken at the expense of environmental values. The State Lands Commission, together with the Coastal Commission, regulates activities pursuant to leases for oil and gas development to ensure that they proceed safely and that marine resources are adequately protected. In this regard, the State Lands Commission enforces requirements similar to those of MMS concerning blowout prevention, drilling practices, production procedures, pollution control, and oil spill prevention, containment and cleanup.

In order to protect particularly sensitive marine areas, the California State Legislature may designate Oil and Gas Sanctuaries in which petroleum development within submerged lands is prohibited. Oil and gas sanctuaries are established in all State waters in the proposed Sanctuary area (California Public Resources Code §6871.2 (d)). Although leasing is normally excluded from the sanctuaries, should underlying oil and gas deposits risk being

drained by wells located on adjacent federal lands--thereby threatening the state's proprietary interest in the resource--the state legislature may open up affected sanctuary areas for a drainage sale.

G. Control of Oil Discharges from Vessels (California Harbors and Navigation Code §133)

The California Harbors and Navigation Code generally applies to the activities of vessels operating in state waters. One of its purposes is to prevent the activities of vessels from adversely affecting the marine environment.

Any person who intentionally or negligently causes or permits any oil to be deposited in the waters of the state is liable for cleanup costs and subject to a \$6,000 civil penalty (California Harbors Code §151).

H. Air Resources (California Health and Safety Code §3900 et seq.)

The California Air Resources Board (ARB) is charged with the maintenance and enhancement of the ambient air quality of the state. The ARB has set air quality standards designed to meet National Ambient Air Quality Standards and delegated their implementation to local Air Pollution Control Districts (APCDs). The proposed Sanctuary is located partly within the following

APCD's: Santa Cruz County, Monterey County, and San Mateo County.

Generally, offshore oil and gas development facilities located within state waters must both obtain a permit from the appropriate APCD and meet ARB emission standards. ARB emission standards are also applicable to sources of emissions located beyond state waters that are related to an onshore facility. In essence, the permit for the onshore facility covers both. Emissions from offshore sources are considered together with those of the related onshore facility. The total emissions level must meet standards set by ARB as implemented by the appropriate APCD.

Emissions from tankers which dock at onshore facilities located in California are also considered together with those of the related onshore facility. As with onshore oil and gas development facilities, the total emissions level of the tanker and the related onshore facility must meet standards set by the ARB as implemented by the appropriate APCD. Unlike other offshore facilities, however, neither the ARB nor an APCD has authority to issue permits solely for tanker emissions.

III. Federal Authorities

Like State authorities, Federal programs vary greatly in approach and scope, ranging from fairly broad-based legislation for resource conservation and environmental protection (e.g., The National Environmental Policy Act and Fishery Conservation and Management Act) to regulation of specific activities and resources.

A. Magnuson Fishery Conservation and Management Act (MFCMA)

(16 USC § 1801 et seq.)

The FCMA provides for the conservation and management of all fishery resources between 3 and 200 nm (5.6 and 370 km) offshore. The National Marine Fisheries Service (NMFS) is charged with establishing guidelines for and approving fishery management plans (FMPs) prepared by regional fishery management councils for selected fisheries. These plans determine the levels of commercial and sport fishing consistent with achieving and maintaining the optimum yield of each fishery. The waters of the proposed marine sanctuary are within the jurisdiction of the Pacific Fishery Management Council (PFMC).

The PFMC has already completed a management plan for anchovy and salmon and is currently preparing plans for groundfish and jack mackerel -- all of which are found in the study area. The final northern anchovy FMP proposes several fishing area closures, none of which fall within the study area. The final implementing regulations state that commercial fishing for reduction purposes (e.g., fish meal and oil) may only proceed in two seasons: from

August 1 to January 31, and from April 1 to June 30. Nonreduction fishing may take place at any time (50 CFR §662.6).

The salmon FMP establishes several management areas having different restrictions on season, size, and gear. The study area is part of two management areas -- Management Area D, which covers the area from the Oregon-California border to Tomales Point, and Management Area E, which covers the area from Tomales Point to the United States-Mexico border. Use of nets to fish for salmon is not allowed in either management area. Different size and seasonal restriction are established for commercial and recreational fishing.

The FMPs for groundfish and jack mackerel address limitations on catch but do not consider closures. Although the FMP for groundfish is only in a draft stage, it does appear possible that the final FMP may aim to protect intertidal spawning grounds and kelp bed habitats such as those found in the study area, which are vital to the survival of lingcod, bocaccio, and numerous rockfish.

Benthic continental shelf fishery resources located outside state waters, such as abalone, lobster, crabs, sea urchins, and corals, are subject to management under the MFCMA. Within Federal waters the MFCMA is enforced by the U.S. Coast Guard (USCG) and the National Marine Fisheries Service (NMFS) within the Department of Commerce. The Act empowers the Secretary of Commerce to enter into agreements with any State agency for enforcement purposes in State waters. Such an agreement exists between the CDFG and NMFS whereby both parties have been deputized to enforce each other's laws. As

a result, PFMC fishery plan enforcement personnel can now enforce State law within 3 nm (5.6km) and State officers can enforce Federal laws between 3 and 200 nm (5.6 and 370 km).

B. Endangered Species Act (16 USC §§1531-1543)

The Federal Endangered Species program provides protection for listed species of marine mammals, birds, and fish in both State and Federal waters. The U.S. Fish and Wildlife Service (FWS) and NMFS determine which species need protection and maintain a list of endangered and threatened species. The most significant protection provided by the Endangered Species Act is the prohibition on taking. The term "take" is defined broadly to mean "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct" [16 USC §1532(19)]. Fish and Wildlife Service regulations interpret the term take to include significant environmental modification or degradation and acts which annoy listed species to such an extent as to significantly disrupt essential behavior patterns (50 CFR 17.3).

The Endangered Species Act also provides for the indirect protection of endangered species and their habitat by establishing a consultation process designed to insure that projects authorized, funded or carried out by Federal agencies do not jeopardize the continued existence of endangered or threatened species, or "result in the destruction or modification of habitat of such species which is determined by the Secretary (of Interior) ... to be critical" (16 USC §1536). Critical habitat areas for endangered species are

designated by the U.S. Fish and Wildlife Service and the National Marine Fisheries Service. The 1978 amendments to the Act establish a Cabinet level committee authorized to exempt Federal agencies (through an elaborate review process) from compliance with their responsibilities in regard to critical habitats upon a finding that there are no reasonable alternatives to the action, and that its benefits outweigh the benefits of other actions consistent with conservation of the species or its critical habitat.

Several species of marine mammals found in the study area are listed as endangered or threatened species. These include: 1) sea otter, 2) grey whale, 3) fin whale, and 4) humpback whale. The blue whale, sei whale, and sperm whale, which have occasionally been sighted in the study area are also listed as endangered or threatened species.

Species of birds listed as endangered or threatened found in the study area include: 1) California brown pelican, 2) California clapper rail, 3) California least tern, 4) Southern bald eagle, and 5) American peregrine falcon, and 6) short tailed albatross.

C. Marine Mammal Protection Act (MMPA) (16 USC §1361 et seq.)

The MMPA, applies to U.S. citizens in State, contiguous zone and International waters, and to foreign nationals subject to U.S. jurisdiction. It is designed to protect all species of marine mammals. While MMPA allows states to petition for the return of management responsibility over harvest of marine mammals, California has done so only with regard to the sea otter and that

petition was later withdrawn.

As specified in the MMPA, the Department Interior, U.S. Fish and Wildlife Service (FWS), is responsible for the management of polar bears, walrus (a pinniped), northern and southern sea otters, three species of manatees, and dugong; and Department of Commerce, National Marine Fisheries Service (NMFS), which is responsible for all other marine mammals. The Marine Mammal Commission advises these implementing agencies and sponsors relevant scientific research. The primary management features of the Act include: 1) a moratorium on "taking" of marine mammals; 2) the development of a management approach designed to achieve an "optimum sustainable population" (OSP) for all species or population stocks of marine mammals; and 3) protection of populations determined to be "depleted".

MMPA defines "take" broadly to include "harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any marine mammal" [16 USC §1362 (12), emphasis added]. The term "harass" has been interpreted to encompass acts unintentionally adversely affecting marine mammals such as operation of motor boats in waters in which these animals are found. The MMPA allows certain exceptions to the moratorium. First, the Secretary may make a special waiver of the moratorium on taking for particular species or populations of marine mammals provided that the species or population being considered is at or above its determined optimum sustainable population. No such waiver, however, has been granted concerning any marine mammal found in the area under consideration.

Secondly, the Act directs officials to seek "an optimum sustainable population (of marine mammals)" [16 USC §1361(6)]. Optimum Sustainable Population (OSP) is defined to mean "the number of animals which will result in the maximum productivity of the population or species keeping in mind the carrying capacity of the habitat and health of the ecosystem of which they form a constituent element" [16 USC §1362(9)].

Marine mammal species whose population is determined to be depleted receive additional protection. Except for scientific research purposes, no permit may be issued for the taking of any marine mammal determined to be depleted. Four species of marine mammals sighted within the study area (the fin whale, the southern population of sea otter, the humpback whale, and the grey whale), and three species or populations which are possible transients (the blue whale, the sperm whale, and the sei whale), are treated as "depleted" based on their listing as endangered or threatened species under the Endangered Species Act.

The MMPA has also recently been amended to include requirements that observers be carried aboard commercial fishing vessels to determine levels of incidental take of marine mammals. Commercial fishing activities are divided into categories on the basis of gear-type and associated levels of potential incidental take of marine mammals. For example it is mandatory for Category 1 vessels such as gillnetters to always carry an observer, whereas Category 3 vessels never have to carry an observer. This observer program has only just been initiated and although the authority for its

management is with the NMFS the day-to-day operational management may be delegated to state and local authorities.

D. Migratory Bird Treaty Act (MBTA) (16 USC §703 et seq.)

The essential provision of the Migratory Bird Treaty Act, which implements conventions with Great Britain and Japan makes it unlawful except as permitted by regulations "to pursue, hunt, take, capture, kill... any migratory bird, any part, nest or egg" or any product of any such bird protected by the Convention (16 USC §703). The Secretary of the Interior is charged with determining when, and to what extent, if at all, and by what means to permit these activities. Each treaty establishes a "closed season" during which no hunting is permitted. A distinction is made between game and nongame birds. The closed season for migratory birds other than game birds is year-round. Of the birds found in the study area only certain species of ducks, geese, coots, gallinules and doves are considered game birds. As specifically permitted by the Act the California Department of Fish and Game has supplemented this authority with its own regulations (see Fish and Game Code Discussion, above).

E. Clean Water Act (CWA) (33 USC §1251 et seq.)

It is the goal of the CWA to restore and maintain the chemical, physical, and biological integrity of the nation's waters. To varying degrees, waters in the territorial sea, the contiguous zone, and the ocean beyond are subject to requirements

of the CWA.

The CWA's chief mechanism for preventing and reducing water pollution is the National Pollutant Discharge Elimination System (NPDES), administered by the Environmental Protection Agency (EPA). Under the NPDES program, a permit is required for the discharge of any pollutant from a point source into the navigable waters of the United States, the waters of the contiguous zone, or ocean waters. Within California state waters, EPA has delegated NPDES permitting authority to the state government.

Since oil and gas development pursuant to Federal lease sales occur on the high seas, an NPDES permit from EPA is required for discharges associated with this activity. EPA generally grants NPDES permits for offshore oil and gas developments based on published effluent guidelines (40 CFR Part 435). Other conditions beyond these guidelines may, however, be imposed by the Regional Administrator on a case-by-case basis. The CWA prohibits the discharge of oil and hazardous substances in such quantities as may be harmful to public health and the environment (except discharges outside the territorial sea permitted by the Act to Prevent Pollution from Ships, 1987 (33 USC § 1901 et seq.)). When such discharges do take place, the National Contingency Plan (NCP) for the removal of oil and hazardous substance discharges (33 USC §1321(c); EO 11735, August 3, 1973), which is designed to minimize the impacts on marine resources, takes effect.

The USCG, in cooperation with EPA, administers the National Contingency Plan (NCP) which applies to all discharges of oil in

the contiguous zone and to activities conducted under the Outer Continental Shelf Lands Act (OCSLA). The latter includes oil and gas activities conducted pursuant to a lease as well as geological and geophysical explorations independent of a lease (43 USC §§1337(a), 1340).

The NCP establishes the organizational framework whereby oil spills are to be cleaned up. To carry out the NCP, regional plans have been established; the USCG has issued such a plan for Federal Region IX which encompasses the study area. Under the plan, Coast Guard personnel are to investigate all reported offshore spills, notify the party responsible (if known) of its obligation to clean up the spill, and supervise the clean-up operation. The Coast Guard retains final authority over the procedures and equipment used in the cleanup. If the party responsible for the spill does not promptly begin cleanup operations, the Coast Guard may hire private organizations.

The Clean Water Act also requires that publicly owned sewage treatment works meet effluent limitations based on effluent reductions attainable through the application of secondary treatment by July 1, 1977 [33 USC §1311(b)(1)]. EPA does have the authority, however, to waive the July 1, 1977 deadline for secondary treatment for discharges into marine waters under certain circumstances (33 USC §1311(h)). Due to the unusual depth of marine waters off the California coast, some municipal sewage treatment works in California discharging into the ocean have requested waivers from secondary treatment requirements (43 F.R.

17484 (4/25/78)). Several communities in the study area are currently discharging wastes into the ocean (see Part II, Section 2).

Permits from the Army Corps of Engineers, (COE) which are based on EPA guidelines, are required prior to the discharge of dredged materials into navigable waters of the United States (33 USC § 1344). Two sites in Monterey Bay are currently used for dredge disposal. Finally, the CWA requires vessels to comply with marine sanitation regulations issued by EPA and enforced by the USCG (33 USC § 1322).

F. Rivers and Harbors Act (33 USC §§ 401 et seq.)

Pursuant to the Rivers and Harbors Act, a permit must be obtained from COE prior to any construction, excavation or fill activities in navigable waters of the United States (33 USC 403). COE may refuse to issue permits on the basis of a threat to navigation or potential adverse effects on living marine resources.

G. Ports and Waterways Safety Act (PWSA) (33 USC §§ 1231 et seq.)

The Ports and Waterways Safety Act (PWSA), as amended by the Port and Tanker Safety Act of 1978, is designed to promote navigation and vessel safety and the protection of the marine environment. The PWSA applies both in state waters and in Federal waters out to 200 miles.

The PWSA authorizes the U.S. Coast Guard to establish vessel

traffic services and systems for ports, harbors, and other waters subject to congested vessel traffic. The absence of a major harbor in Monterey Bay and the resulting relatively low level of vessel traffic into and out of the Bay has precluded the need for a vessel traffic separation scheme (VTSS) or other formal regulatory mechanisms for ensuring vessel safety.

The U.S. Coast Guard provides two sets of customary vessel traffic lanes on navigational charts for vessels traversing the West coast. One set of customary traffic lanes is an extension of the Southern VTSS for San Francisco Bay and is intended for vessels traveling north and southbound along the coast. The other is intended primarily for east-bound traffic heading to and from ports further south in California. Adherence to these lanes is strictly voluntary. The lanes merely serve as navigational aids, indicating to mariners who are unfamiliar with the area that vessel traffic historically has followed those patterns, and that the lanes have been found to be safe. In addition to vessel traffic control, the U.S. Coast Guard regulates other navigational and shipping activities. It has promulgated numerous regulations relating to vessel design, construction, and operation designed to minimize the likelihood of an accident and reduce vessel source pollution.

The 1978 amendments of the PWSA establish a comprehensive program for regulating the design, construction, operation, equipping, and banning of all tankers using U.S. ports to transfer oil and hazardous materials. These requirements are, for the most part, in agreement with protocols (passed in 1978) to the

International Convention for the Prevention of Pollution from Ships, 1973, and the International Convention on Safety of Life at Sea, 1974.

The U.S. Coast Guard is also vested with the primary responsibility for maintaining boater safety, including the tasks of conducting routine vessel inspections and coordinating rescue operations.

H. Act to Prevent Pollution from Ships (APPS) (33 USC §§ 1901 et seq.)

The International Convention for the Prevention of Pollution of the Sea by Oil, 1954, and the Oil Pollution Act of 1961 have been superseded by the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the 1978 Protocol relating thereto (MARPOL 73/78) and implemented by the Act to Prevent Pollution from ships, 1980, as amended in 1982, 1987. The APPS regulates discharges of oil or oily mixtures from vessels with the exception of tankers of less than than 150 gross tons and other vessels of less then 500 gross tons. Enforcement of the Act is the responsibility of the USCG.

Except for discharges from machinery space bilges, tankers subject to the Act may not discharge oil or oily mixtures unless they are 50 nautical miles from the nearest land; the total quantity of oil discharges cannot exceed one part in 15,000 of the total cargo capacity. Discharges from other vessels regulated by the Act, and discharges from the machinery bilges of tankers must

be made as far as practicable from land and may not have an oil content of more than 100 parts per million. In addition to these requirements, discharges by an vessel regulated by the Act must be made while the vessel is en route. The instantaneous discharge rate must not exceed sixty liters per mile.

I. The Oil Pollution Act of 1990 (P.L. 101-380, 33 U.S.C. 2701 et seq.)

The Oil Pollution Act of 1990 creates a comprehensive prevention, response, liability, and compensation regime for dealing with vessel and facility-caused oil pollution. It substantially increases Federal oversight of oil transportis divided into three subtitles: A) Prevention; B) Removal; and C) Penalties and Miscellaneous. Subtitle A gives added responsibility to the Coast Guard regarding merchant marine personnel, including the review of alcohol and drug abuse and review of criminal records prior to issuance and renewal of documentation. It also increases the responsibility of the Coast Guard to: 1) regulate the conduct of tankers by requiring some vessels to participate in vessel traffic service systems, and 2) authorize the region.

Title I creates a liability and compensation regime for tank vessel and facility-source oil pollution. Any party responsible for the discharge, or the substantial threat of discharge, of oil into navigable waters or adjoining shorelines is liable for the removal costs and damages for injury, destruction, loss or loss of use of natural resources, including assessment costs, real or

personal property damages, subsistence use, lost government revenues, and lost profits and earning capacity. NOAA has the responsibility of promulgating damage assessment regulations. Sums recovered by a trustee for natural resource damage will be retained in a revolving trust account to reimburse or pay costs incurred by the trustee with respect to those resources.

Title II makes numerous amendments mandating that other Federal statutes conform to the provisions of the Oil Pollution Act.

Title III encourages the establishment of an international inventory of spill removal equipment and personnel.

Title IV is divided into three subtitles: A) Prevention; B) Removal; and C) Penalties and Miscellaneous. Subtitle A gives added responsibility to the Coast Guard regarding merchant marine personnel, including the review of alcohol and drug abuse and review of criminal records prior to issuance and renewal of documentation. It also increases the responsibility of the Coast Guard to: 1) regulate the conduct of tankers by requiring some vessels to participate in vessel traffic service systems, and 2) authorize the expansion, construction, improvement and operation of Vessel Traffic Systems in United States Ports.

More specifically, Subtitle A establishes double hull requirements for tank vessels. Most tank vessels over 5,000 gross tons will be required to have double hulls by 2010, while vessels under 5,000 gross tons will be required to have a double hull or double containment systems by 2015. All newly constructed tankers must contain a double hull (or double containment system if under

5,000 gross tons), while existing vessels are phased out over a period of years.

Subtitle B amends subsection 311 (c) of the Clean Water Act, requiring the Federal Government to ensure immediate removal from navigable waters or adjoining shorelines of any oil or hazardous substance that threatens to affect natural resources. It also requires a revision and republication of the National Contingency Plan within one year which will include, among other things, a Fish and Wildlife response plan developed in consultation with NOAA and U.S. Fish and Wildlife Service. Nothing in Subtitle B preempts the rights of States to require stricter standards for removal actions.

Subtitle C alters and increases civil and administrative penalties for discharges and violations of regulations under the Clean Water Act. As well as criminal penalties, other penalties are included for negligent operations and failure to comply with Federal law on carriage of liquid bulk dangerous cargoes, load lines, manning, and crew complements and requirements. Financial responsibility and civil penalties may be assessed up to \$25,000 per day. All penalties are to be paid into the Oil Spill Liability Trust Fund.

Title VII authorizes oil pollution research and technology development, including the establishment of an Interagency Coordinating Committee, that is chaired by Department Of Transportation and comprised of representatives from the Departments of Energy, Interior, Commerce (NOAA), Environmental Protection Agency, Federal Emergency Management Agency, National

Aeronautics and Space Administration, and the U.S. Fire Administration.

Title IX amends the Oil Spill Liability Trust Fund and increases from \$500 million to \$1 billion the amount that can be spent on any single oil spill incident, of which no more than \$500 million may be spent on natural resource damages.

J. The Marine Plastic Pollution Research and Control Act of 1987 (MPPRCA) (33 USC §§ 1901-1903, 1905, 1907-1909, 1912)

The MPPRCA amends the APPS to implement Annex V of the International Convention for the Prevention of Pollution from Ships (MARPOL) in the United States. The MPPRCA prohibits dumping plastics at sea and severely restricts dumping other types of ship-generated garbage, both at sea and in the navigable waters of the United States. The Annex V provisions of the MPPRCA apply to all watercraft, including small recreational vessels.

K. The Federal Aviation Act of 1958 (49 USC §§1301 et. seq.)

The Federal Aviation Act of 1958 establishes the Federal Aviation Administration and gives it broad powers to promote air commerce and to regulate the use of navigable airspace to ensure aircraft safety and efficient use of such airspace. In furtherance of this mandate, the FAA publishes aeronautical charts which provide a variety of information to pilots, including the location of sensitive areas which should be avoided.

L. Clean Air Act (CAA) (42 USC §7401 et seq.)

The Clean Air Act (CAA) sets general guidelines and minimal air quality standards on a nationwide basis in order to protect and enhance the quality of the Nation's air resources. States are responsible for developing comprehensive plans for all regions within their boundaries. Thus, as noted above, discharges of air pollutants within California state waters are subject to the control of the California Air Resources Board.

Beyond state waters, in EPA Region IX, which includes the study area, EPA has asserted that the new Prevention of Significant Deterioration (PSD) provisions of the CAA apply to new sources on the OCS that can adversely affect air quality over the United States (EPA Office of General Counsel Opinion, April 18, 1978). These regulations would supplement Department of the Interior OCS air quality regulations. However, the U.S. Ninth Circuit Court of Appeals has held that the 1978 Amendments to the OCSLA grant the Secretary of the Interior exclusive authority to promulgate regulations for compliance with ambient air quality standards pursuant to the Clean Air Act (State of California v. Kleppe, Doc. No. 2363 (9th Cir. August 20, 1979)).

M. Outer Continental Shelf Lands Act OCSLA (43 USC §1331 et seq.)

The Outer Continental Shelf Lands Act, (OCSLA) as amended in 1978 and 1985, establishes Federal jurisdiction over the mineral resources of the Outer Continental Shelf (OCS) beyond 3 nm (5.6 km)

and gives the Secretary of Interior primary responsibility for managing OCS mineral exploration and development. The Secretary's responsibility has been delegated to the Minerals Management Service (MMS).

In unique or special areas, MMS may impose special lease stipulations designed to protect specific geological and biological phenomena. These stipulations may vary among lease sale tracts and sales. Lessees are required to include, in exploration, development and production plans, specific information concerning emission and their potential impacts on coastal areas. MMS is also charged with supervising OCS operations and enforcing regulations under its supervisory role made pursuant to OCSLA (30 CFR Part 250 and 256) and the enforcement of stipulations applicable to particular leases.

In addition to DOI, both the Army Corps of Engineers (COE) and the U.S. Coast Guard (USCG) have responsibility over OCS mineral development under the PWSA to the extent that such development affects navigation. COE is responsible for ensuring, through a permit system, that OCS structures including pipelines, platforms, drill ships, and semi-submersibles, do not obstruct navigation [43 USC § 1333]. USCG ensures that structures on the OCS are properly marked and that safe working conditions are maintained onboard [43 USC § 1333].

N. Title I of the Marine Protection, Research, and Sanctuaries Act (33 USC §§1401 et seq.).

Title I of the Marine Protection, Research, and Sanctuaries Act (MPRSA), also known as the Ocean Dumping Act, addresses the dumping of materials into the territorial sea, the contiguous zone and the ocean beyond. EPA regulates, through the issuance of permits, the dumping of all materials except dredged materials; COE exercises authority over dredged materials.

O. National Historic Preservation Act (NHPA) (16 USC §§ 470 et seq.)

The National Historic Preservation Act authorizes the Secretary of the Interior to maintain a National Register of "districts, sites, buildings, structures, and objects significant in American history, architecture, archeology, and culture". Sites have been listed on the National Register which include or are composed entirely of ocean waters and submerged lands within state waters or on the Outer Continental Shelf.

Should any sites in the study area be listed on the National Register, any federal agency conducting, licensing, or assisting an undertaking which may affect a listed site must provide the Advisory Council on Historic Preservation a reasonable opportunity to comment on the proposed action (16 USC §470f). The basic criterion applied by the Council is whether the undertaking will change the quality of the site's historic, architectural, archeological, or cultural character (36 CFR Part 800).

IV. Additional Special Areas/Agencies

A. Los Padres National Forest

The United States Forest Service is responsible for the management of the Los Padres National Forest. The Forest parallels the coast from Mount Carmel (near Point Sur) in the north to the Monterey County-San Luis Obispo County boundary in the south. The Forest includes two coastal areas, one encompassing Cooper Point and Pfeiffer Point at the northern boundary of the Forest and the other extending from the Lucia vicinity (near Lopez Point) to the Monterey County-San Luis Obispo County boundary.

For management purposes, the Forest is divided into several planning units. Both coastal areas of the Forest are included within the Big Sur Coastal Planning Unit. The unit as a whole is 52 sm (83 km) long and varies from 3 to 9 sm (4.8 to 14.4 km) in width. Both coastal areas also fall within the boundaries of the California Sea Otter Game Refuge. Adjoining the Planning Unit are four State Parks, including the Julia Pfeiffer Burns State Park, which is operated in conjunction with the adjacent under-water park, and two ASBSs at Julia Pfeiffer Burns Underwater Park and the ocean area surrounding the mouth of Salmon Creek (see above).

Management policies for the Big-Sur Coastal Planning Unit are described in a recently issued Land Management Plan. The Forest Service worked closely with many governmental agencies in the formulation of the plan, including, in particular, the CDNR and CDFG, which manage areas directly adjacent to the unit. It is the intent of the plan that all management policies be implemented in

harmony with affected agencies.

Specific management policies of the plan which are relevant to the study area include ensuring the protection of the Salmon Creek and Julia Pfeiffer Burns Underwater Park ASBSs prior to proceeding with any resource development, maintaining a high level of water quantity and quality, and ensuring that the management of the Planning Unit is consistent with the California Coastal Plan for the Monterey Coast.

B. Military Activities

The United States Army maintains an offshore restricted area extending approximately 8,000 yards offshore from its Fort Ord Military Installation. The restricted area functions as a safety buffer to protect the seagoing public from stray firearm rounds escaping from small arms firing ranges at Ford Ord. The ranges are used intermittently throughout the year. While onshore dune backstops contain most stray shots, a certain proportion reach the adjacent ocean area.

Commercial and sport boating and fishing activities are prohibited in the restricted area on days when the ranges are used. A colored warning flag is flown onshore whenever the ranges are used. The restricted area appears on all nautical charts of the Bay, and schedules for the range are published in the Coastal Pilot. Two U.S. Army patrol boats escort mariners away from the restricted zone on practice firing days. This danger zone also is utilized for Navy mine warfare operations from February through

July each year.

The restricted area maintained by the U.S. Army in Monterey Bay appears to provide adequate protection to the sensitive marine resources from any currently conducted military training activities which might adversely affect them. The U.S. Navy's utilization of a nearby Bay portion for mine sweeping maneuvers from February through July each year appears to pose no serious threat to the resources and qualities of the area. On-going law enforcement programs involving overflights and use of vessels also appear to be infrequent and pose no threat to Sanctuary resources and qualities.

No prohibition set forth in the Sanctuary regulations shall apply to activities that are necessary for national defense or law enforcement. It is suspected that current and projected levels of military activity are consistent with the purposes for which the Sanctuary was designated.

Nevertheless, NOAA will consult with the appropriate Department or agency and encourage continued monitoring of these activities for undesirable environmental impacts. In addition, NOAA is proposing to require the relevant agency to consult with NOAA to determine methods of minimizing any adverse environmental impacts if there is sufficient time to permit consultation without jeopardizing national defense or law enforcement. Activities that are not necessary for national defense or law enforcement, such as training exercises and routine vessel operations, are subject to all prohibitions contained in the Sanctuary regulations.

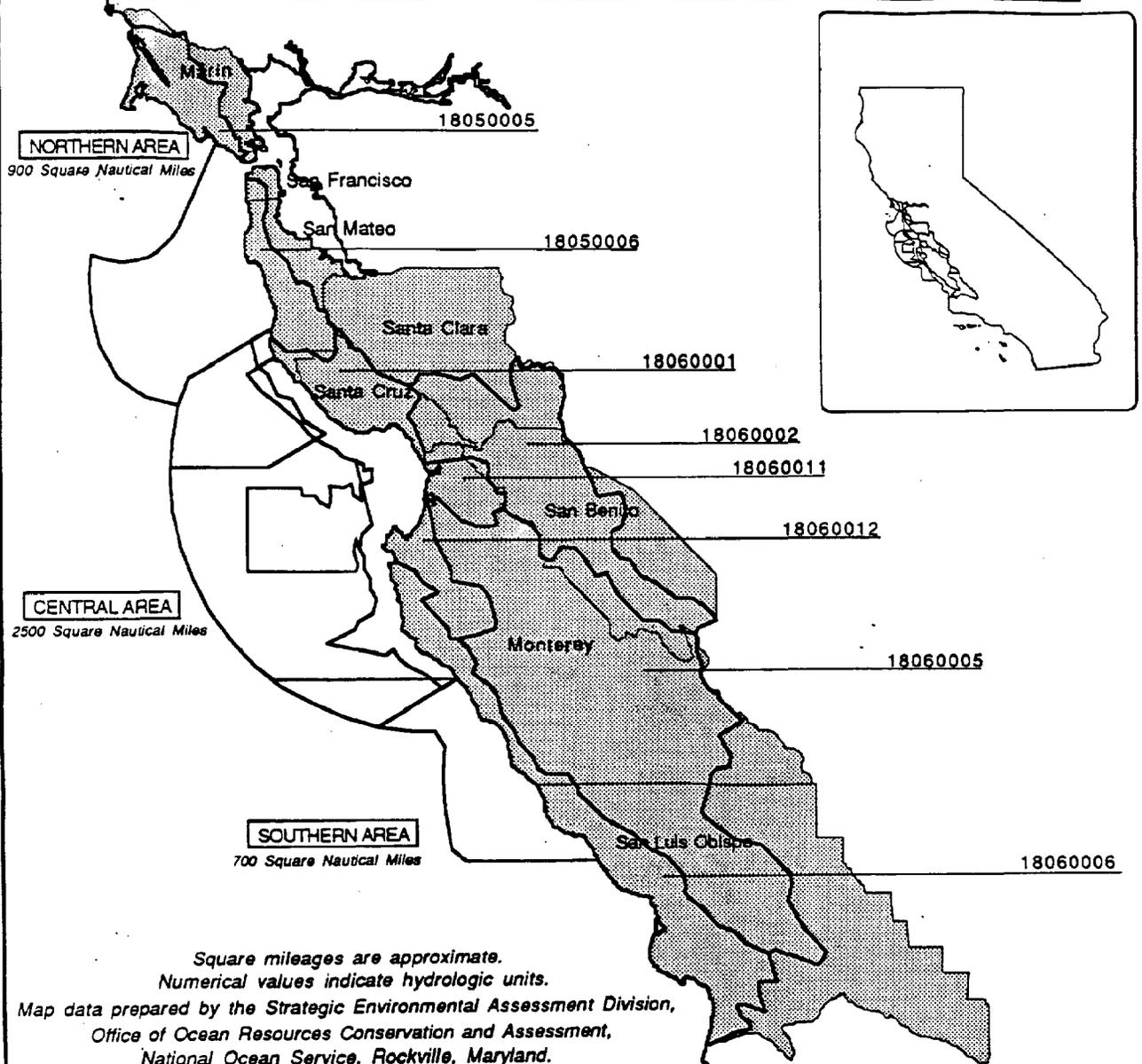
APPENDIX D: DISCHARGE AND DEPOSITS INTO THE MONTEREY BAY AREA

Discharge and Deposits into the Monterey Bay Area

FIGURE D-1

Figure D-1 shows the entire study area and proposed boundaries for the Monterey Bay National Marine Sanctuary. The study area, Boundary alternative #5, was divided into three areas: (1) the Central Area, corresponding to Boundary Alternative #2 and watersheds that drained into this alternative; (2) the Northern Area, which corresponds only to the northern extension provided by Boundary Alternative #4, and watersheds that drained into this northern area, and (3) the Southern Area, which corresponds only to the southern extension provided by Boundary Alternative #3 and watersheds that drained into this southern area. The following tables and figures subdivide the discharge and deposit data first by these three analysis areas, (north, central, south) and then subdivide the data by watershed (Hydrographic Unit) and county.

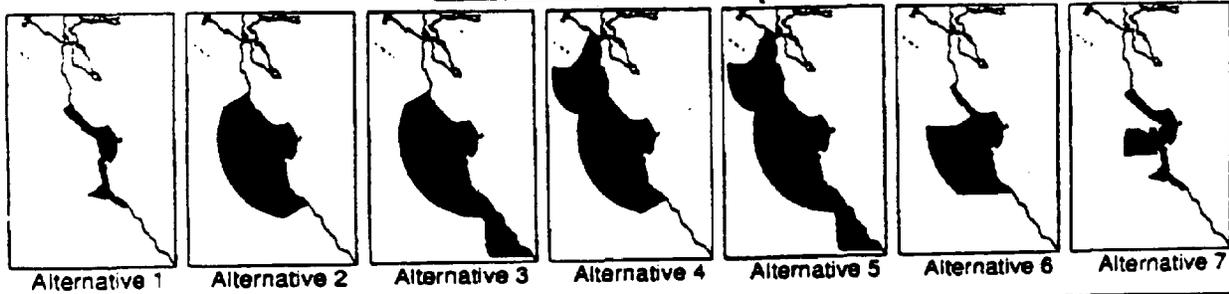
MONTEREY BAY SANCTUARY BOUNDARIES, ANALYSIS AREAS, ADJACENT COUNTIES, AND HYDROLOGIC UNITS



Square mileages are approximate.
Numerical values indicate hydrologic units.

Map data prepared by the Strategic Environmental Assessment Division,
Office of Ocean Resources Conservation and Assessment,
National Ocean Service, Rockville, Maryland.

BOUNDARY ALTERNATIVES



Alternative 1

Alternative 2

Alternative 3

Alternative 4

Alternative 5

Alternative 6

Alternative 7

TABLE D-1

Table D-1 shows the amounts and seasonal loadings of pollutants from Point Source dischargers, by analysis area, hydrographic unit and county. This data is derived by using values from either Permits, monitoring data, or modeling predictions. It should be noted that this data is approximately ten years old. This information is provided to give an estimate of relative loadings between analysis areas and an estimate of cumulative loadings rather than to determine the exact pollutant contribution from any one discharge source.

POINT SOURCE DISCHARGES BY FACILITY WITHIN HYDROLOGIC UNITS ADJACENT TO THE SANCTUARY STUDY AREA, CIRCA 1994

AREA	HYDROGRAPHIC UNIT	INCLUDED COUNTIES	PERMITS*	FACILITY NAME	ANNUAL											FC (TOTAL CELLS)		
					AS (LBS)	CD (LBS)	CR (LBS)	CU (LBS)	FE (LBS)	FS (LBS)	HQ (LBS)	ZN (LBS)	OK (LBS)					
NORTH	18090006	MARIN SAN FRANCISCO SAN MATEO	CA0037681 CA0037494 CA0037737	MINOR WASTEWATER PUBLIC	48.20	17.20	68.40	68.80	1,086.00	68.00	68.00	0.87	832.00	17,180.00	0.00	1,380,000,000,000		
				RICHMOND SUNSET WWTF**	133.20	598.00	68.40	3,980.00	183,000.00	3,250.00	66.60	82,690.00	2,040,000.00	6,050,000,000,000,000				
				HALE MOON BAY **	238.00	63.20	316.00	5,180.00	4,820.00	820.00	2.75	1,216.00	63,200.00	4,880,000,000,000				
				PACIFICA WWTF**	222.00	77.80	298.00	258.00	4,820.00	308.00	8.87	1,138.00	77,800.00	6,250,000,000,000				
				DAILY CITY WWTF**	238.00	238.00	118.80	1,680.00	16,800.00	118.80	80.70	1,980.00	61,600.00	21,600,000,000,000				
					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0			
					880.40	1,014.20	882.80	6,228.80	180,886.00	4,144.80	98.19	28,886.00	2,278,880.00	6,055,820,000,000,000				
				SUBTOTAL														
				CENTRAL	18060001	SAN MATEO SANTA CRUZ	NONE	MINOR WASTEWATER PUBLIC	5.80	2.08	7.84	6.80	128.00	8.18	0.07	30.20	2,080.00	198,000,000,000
								MINOR INDUSTRIAL	0.00	0.00	0.00	0.00	61.20	0.88	0.00	0.00	0.00	0
				MINOR INDUSTRIAL	0.00	0.00	0.00	0.00	61.20	0.88	0.00	0.00	0.00	0				
				MINOR INDUSTRIAL	0.00	0.00	0.00	0.00	204.00	0.00	0.00	0.00	0.00	0				
				MINOR INDUSTRIAL	0.00	0.00	0.00	0.00	61.20	0.00	0.00	0.00	0.00	0				
				MINOR INDUSTRIAL	0.00	0.00	0.00	0.00	147.20	0.00	0.00	0.00	0.00	0				
				MINOR DRINKING WATER	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0				
				MINOR INDUSTRIAL	0.00	0.00	0.00	0.00	40.80	0.00	0.00	0.00	0.00	0				
				MINOR INDUSTRIAL	0.03	0.17	0.85	0.65	8.48	1.82	0.01	1.36	0.00	0				
				MINOR WASTEWATER PUBLIC	0.95	0.38	1.33	1.28	23.00	1.98	0.01	228.43	363.74	6,471,000,000,000				
				MINOR WASTEWATER PUBLIC	68.40	65.20	530.00	400.00	100,200.00	2,480.89	804.00	530.00	818,000.00	3,700,000,000,000,000				
				MINOR INDUSTRIAL	0.00	0.00	0.00	0.00	0.00	0.68	0.00	0.00	0.00	0				
				MINOR INDUSTRIAL	0.00	0.00	0.00	0.00	61.20	0.00	0.00	0.00	0.00	0				
				MINOR INDUSTRIAL	0.03	0.13	0.64	0.64	6.44	0.77	0.01	1.03	0.00	0				
				WATSONVILLE WWTF **	872.00	1,394.00	2,380.00	3,740.00	82,800.00	1,512.60	18.10	12,840.00	704,000.00	2,320,000,000,000,000				
					0.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0				
					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0				
				MINOR WASTEWATER PUBLIC	184.20	58.80	224.00	193.80	3,840.00	228.00	1.84	860.00	58,800.00	4,720,000,000,000				
				MINOR INDUSTRIAL	1.12	0.37	14.94	14.94	282.00	18.88	0.11	37.40	4,180.00	338,000,000,000				
				MINOR INDUSTRIAL	0.00	0.00	0.00	0.00	0.00	0.68	0.00	0.00	0.00	0				
				MINOR INDUSTRIAL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0				
				MINOR INDUSTRIAL	0.00	0.00	0.01	0.01	0.06	0.61	0.00	0.01	0.00	0				
				P G & E MOSS LANDING **	272.00	35.00	234.00	5,020.00	3,120.00	38.00	4.88	2,720.00	1,884,000.00	0				
				NATIONAL REFRIGERATION, MOSS LANDING **	2,380.00	1,772.00	4,140.00	1,182.00	0.00	11,820.00	198.00	11,820.00	0.00	0				
					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0				
				MINOR INDUSTRIAL	0.00	0.00	0.00	0.00	68.00	0.00	0.00	0.00	0.00	0				
				MINOR INDUSTRIAL	0.00	0.00	0.00	0.00	61.20	0.00	0.00	0.00	0.00	0				
				EL PASO DE ROBLES WWTF	118.00	41.40	158.80	138.00	2,560.00	163.40	1.38	804.00	41,200.00	3,320,000,000,000				
					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0				
				MINOR INDUSTRIAL	64.89	22.87	88.29	74.79	1,404.36	89.88	0.75	391.63	22,872.80	1,823,000,000,000				
				MINOR WASTEWATER PUBLIC	88.51	30.83	117.71	102.01	1,915.64	122.32	1.02	482.37	30,827.20	2,487,000,000,000				
				PACIFIC GROVE WWTF **	143.40	228.00	388.00	614.00	10,320.00	248.00	2.48	8,120.00	381,000,000,000,000					
				MONTEREY REGIONAL WWTF **	1,682.00	562.00	2,200.00	1,914.00	38,000.00	2,300.00	18.20	8,600.00	48,700,000,000,000					
					5,875.82	4,273.78	10,523.84	13,488.18	224,252.37	19,042.68	387.22	41,080.40	4,075,758.82	6,487,188,500,000,000				
SOUTH	18080006	MONTEREY		MINOR WASTEWATER PUBLIC	0.13	0.03	2.84	2.82	67.40	2.58	0.02	7.18	1,428.00	47,000,000,000,000				
SUBTOTAL					0.19	0.03	2.84	2.82	67.40	2.58	0.02	7.18	1,428.00	47,000,000,000,000				
GRAND TOTAL					6,758.05	5,288.01	11,388.38	18,717.80	415,005.77	23,180.04	453.43	67,886.58	6,357,184.82	12,570,108,500,000,000				

* NUMBERS REPRESENT NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM MAJOR PERMIT; ALL OTHERS ARE MINOR
 ** DISCHARGE DIRECTLY INTO THE OCEAN WATERS OF THE MONTEREY BAY SANCTUARY STUDY AREA

NONE means no data available in database.
 CODES = A:arsenic; CD:cadmium; CR:chromium; CU:copper; FE:iron; HQ:mercury; HQ:mercury; ZN:zinc; OIL:oil and grease; FC:fecal coliform bacteria.
 Source: National Coastal Pollutant Discharge Inventory, Office of Ocean Resources Conservation and Assessment, Strategic Environmental Assessment Division, National Ocean Service, Rockville Maryland

TABLE D-2

Table D-2 shows the relative loadings from point source and various non-point sources in the Monterey Bay area by analysis area, hydrographic unit and county. Data is shown for a variety of pollutant constituents including total wastewater flow, total suspended sediments, biochemical oxygen demand, total lead, total copper, total nitrogen, total phosphorus, total oil and grease, and total fecal coliform bacteria.

WASTEWATER FLOW, CIRCA 1994
(billions of gallons per year)

AREA	HYDROGRAPHIC UNIT	INCLUDED COUNTIES	POINT SOURCES				NONPOINT SOURCES						TOTAL	
			WASTE WATER TREATMENT PLANTS	DIRECT INDUSTRIAL DISCHARGERS	POWER PLANTS	URBAN RUNOFF	CROPLAND RUNOFF	FOREST LAND RUNOFF	PASTURE/RANGE	IRRIGATION RETURN FLOW	UPSTREAM SOURCES			
NORTH	18050005	MAJIN	0.2	0	0	0	0	54	82.4	78.4	0	0	0	186
	18050006	SAN FRANCISCO	8	0	0	1.8	0	0	0	0	0	0	0	9.7
		SAN MATEO	4.8	0	0	6.04	1.53	17.2	28.9	0	0	0	0	57
CENTRAL	18080002	SAN MATEO	0	0	0	0	0	1.3	0	0	0	0	0	1.3
		SANTA CRUZ	12.8	0	0	8.44	55.53	90.9	105.3	0	0	0	0	263
		SAN MATEO	0	0	0	0	2	2.9	2.8	0	0	0	0	7.8
SUBTOTAL	18080001	SANTA CRUZ	5.1	0.2	0	14.4	2.1	15.7	2.1	0	0	0	0	39.6
		SANTA CLARA	0	0	0	3.1	7.5	27	18.5	0	0	0	0	54.1
		SANTA CRUZ	3.1	0.04	0	1.3	6.3	0.8	1.4	0	0	0	0	20.1
SUBTOTAL	18080011	MONTEREY	0	0	0	0	1.5	0.3	0	0	0	0	0	1.8
		SAN BENITO	0.8	7.1	281	1.9	4.8	0	0	0	0	0	0	286.4
		MONTEREY	0	0.2	0	0.4	2.4	8.9	4.3	13.9	1.4	0	0	28.3
SUBTOTAL	18080005	MONTEREY	0	0.02	0	2.9	5.4	2.5	0.6	1.2	0	0	0	13.2
		SAN LUIS OBISPO	0.4	0	0	0	0	0	0	0	0	0	0	0.4
		SAN BENITO	7.2	0.01	0	8.8	0.2	0.8	2.8	0	0	0	0	19.6
SUBTOTAL	18080012	MONTEREY	16.4	7.57	281	32.6	32.2	55.9	30.5	15.1	0	0	0	478.9
		SOUTH	0.01	0	0	0	0.05	15.1	0	0	0	0	0	15.2
		SUBTOTAL	0.01	0	0	0	0.05	15.1	0	0	0	0	0	16.2
GRAND TOTAL			281	7.57	281	41.04	87.78	151.9	136.8	15.1	0	0	758.1	

Source: The National Coastal Pollutant Discharge Inventory, Strategic Environmental Assessment Division, Office of Ocean Resources Conservation and Assessment, National Ocean Service, Rockville, Maryland.

TOTAL SUSPENDED SEDIMENTS (TSS), CIRCA 1984
(millions of tons per year)

AREA	HYDROGRAPHIC UNIT	INCLUDED COUNTIES	POINT SOURCES					NONPOINT SOURCES					TOTAL	
			WASTE WATER TREATMENT PLANTS	DIRECT INDUSTRIAL DISCHARGERS	POWER PLANTS	URBAN RUNOFF	CROPLAND RUNOFF	FOREST LAND RUNOFF	PASTURE/RANGE	IRRIGATION RETURN FLOW	UPSTREAM SOURCES			
NORTH	18090005	MARIN	0.04	0.00	0.00	0.00	0.00	2,020.00	301.00	8,340.00	0.00	0.00	0.00	7,661.00
	18090006	SAN FRANCISCO	4.80	0.00	0.00	4.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.20
	18090007	SAN MATEO	1.00	0.00	0.00	1.00	480.00	177.80	2,141.00	0.00	0.00	0.00	0.00	2,820.00
SUBTOTAL		SANTA CRUZ	0.00	0.00	0.00	0.00	0.00	10.80	0.00	0.00	0.00	0.00	0.00	10.80
			5.84	0.00	0.00	5.30	2,510.00	489.80	7,481.00	0.00	0.00	0.00	0.00	10,501.00
CENTRAL	18090001	SAN MATEO	0.00	0.00	0.00	0.00	0.00	177.00	35.00	34.40	0.00	0.00	0.00	227.20
	18090002	SANTA CRUZ	2.90	0.00	0.00	21.80	45.40	110.80	64.80	0.00	0.00	0.00	0.00	245.30
	18090003	SANTA CLARA	0.00	0.00	0.00	4.70	68.80	470.00	1,204.80	0.00	0.00	0.00	0.00	1,745.80
SUBTOTAL		SANTA CRUZ	2.40	0.00	0.00	8.00	148.00	0.00	8.80	0.00	0.00	0.00	0.00	168.70
		MONTEREY	0.00	0.00	0.00	0.00	80.80	8.40	0.00	0.00	0.00	0.00	0.00	98.20
		MONTEREY	0.15	4.00	0.00	2.80	400.00	0.00	0.00	0.00	0.00	0.00	0.00	408.80
SUBTOTAL	18090008	SAN BENITO	0.00	0.00	0.00	0.00	0.00	1,210.00	1,850.00	524.00	0.00	0.00	0.00	2,487.00
	18090009	MONTEREY	0.10	0.00	0.00	4.40	1,098.00	224.00	21.40	0.00	0.00	0.00	0.00	1,347.00
	18090010	SAN LUIS OBISPO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SUBTOTAL	18090011	SAN BENITO	2.30	0.00	0.00	12.90	19.70	83.70	3.70	0.00	0.00	0.00	0.00	124.40
	18090012	MONTEREY	7.85	4.00	0.00	48.90	2,194.10	2,769.90	1,889.70	0.00	0.00	0.00	0.00	6,946.50
SUBTOTAL	18090006	MONTEREY	0.00	0.00	0.00	0.00	5.40	611.00	1.10	0.00	0.00	0.00	0.00	617.70
	18090007		0.00	0.00	0.00	0.00	5.40	611.00	1.10	0.00	0.00	0.00	0.00	617.70
	18090008		13.79	4.00	0.00	64.20	4,981.50	3,889.40	9,315.20	0.00	0.00	0.00	0.00	17,985.20

Source: The National Coastal Pollutant Discharge Inventory, Strategic Environmental Assessment Division, Office of Ocean Resources Conservation and Assessment, National Ocean Service, Rockville, Maryland.

BIOCHEMICAL OXYGEN DEMAND (BOD), CIRCA 1994
(pounds X 10,000 per Year)

AREA	HYDROGRAPHIC UNIT	INCLUDED COUNTIES	POINT SOURCES					NON-POINT SOURCES					TOTAL	
			WASTE WATER TREATMENT PLANTS	DIRECT INDUSTRIAL DISCHARGERS	POWER PLANTS	URBAN RUNOFF	CROPLAND RUNOFF	FORESTLAND RUNOFF	PASTURE/RANGE	IRRIGATION RETURN FLOW	UPSTREAM SOURCES			
NORTH	18060005	MARIN	4.50	0.00	0.00	0.00	0.00	1,412.00	90.40	2,140.00	0.00	0.00	0.00	3,647.00
		SAN FRANCISCO	1,070.00	0.00	0.00	63.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1,133.10
		SAN MATEO	72.10	0.00	0.00	66.40	382.00	120.00	4.70	1,287.00	0.00	0.00	0.00	1,837.80
		SANTA CRUZ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.70
SUBTOTAL			1,146.60	0.00	0.00	129.50	1,804.00	215.10	3,427.00	0.00	0.00	0.00	6,722.40	
CENTRAL	18060001	SAN MATEO	0.00	0.00	0.00	0.00	142.00	10.00	9.70	0.00	0.00	0.00	0.00	162.00
		SANTA CRUZ	695.10	0.10	0.00	143.40	19.00	67.00	51.80	0.00	0.00	0.00	0.00	976.80
		SANTA CLARA	0.00	0.00	0.00	31.00	31.70	221.30	382.20	0.00	0.00	0.00	0.00	646.20
		SANTA CRUZ	622.00	0.00	0.00	13.20	78.00	0.00	4.20	0.00	0.00	0.00	0.00	721.40
		MONTEREY	0.00	0.00	0.00	0.00	55.20	10.10	0.00	0.00	0.00	0.00	0.00	65.30
		SAN BENITO	17.70	2.10	0.00	18.50	163.40	0.00	0.00	0.00	0.00	0.00	0.00	201.60
		MONTEREY	0.00	0.00	0.00	3.50	66.80	3,689.20	1,008.00	0.00	0.00	0.00	1.20	4,768.60
		SAN LUIS OBISPO	0.00	0.00	0.00	28.20	798.00	30.30	3.60	0.00	0.00	0.00	0.00	837.50
		SAN BENITO	3.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.20
		SUBTOTAL	18060012	MONTEREY	289.70	0.00	0.00	86.00	9.40	50.30	11.50	0.00	0.00	0.00
		MONTEREY	1,631.70	2.20	0.00	324.80	1,331.80	4,081.20	1,451.00	0.00	0.00	0.00	8,630.70	
SOUTH	18060006	MONTEREY	0.20	0.00	0.00	0.00	2.70	1,220.00	0.20	0.00	0.00	0.00	1,223.00	
		SUBTOTAL	0.20	0.00	0.00	0.00	2.70	1,220.00	0.20	0.00	0.00	0.00	1,223.00	
GRAND TOTAL			2,778.50	2.20	0.00	454.30	3,136.30	5,516.30	4,878.20	0.00	0.00	0.00	16,776.10	

Source: The National Coastal Pollutant Discharge Inventory, Strategic Environmental Assessment Division, Office of Ocean Resources Conservation and Assessment, National Ocean Service, Rockville, Maryland.

AREA	HYDROGRAPHIC UNIT	INCLUDED COUNTIES	TOTAL COPPER (CU), CIRCA 1984 (thousands of pounds per year)										TOTAL
			POINT SOURCES					NONPOINT SOURCES					
			WASTE WATER TREATMENT PLANTS	DIRECT INDUSTRIAL DISCHARGERS	POWER PLANTS	URBAN RUNOFF	CROPLAND RUNOFF	FOREST LAND RUNOFF	PASTURE/RANGE	IRRIGATION RETURN FLOW	UPSTREAM SOURCES		
NORTH	18050005	MARIN	0.08	0.00	0.00	0.00	100.80	15.10	288.00	0.00	0.00	0.00	
	18050006	SAN FRANCISCO	3.98	0.00	0.00	1.40	0.00	0.00	0.00	0.00	0.00	8.30	
		SAN MATEO	2.10	0.00	0.00	2.30	14.70	5.30	64.20	0.00	0.00	88.80	
		SANTA CRUZ	0.00	0.00	0.00	0.00	0.00	0.30	0.00	0.00	0.00	0.30	
SUBTOTAL			6.14	0.00	0.00	3.70	115.50	20.70	390.20	0.00	0.00	478.40	
CENTRAL	18060001	SAN MATEO	0.00	0.00	0.00	0.00	5.30	0.75	0.73	0.00	0.00	6.80	
		SANTA CRUZ	0.46	0.04	0.00	5.10	1.30	3.20	1.90	0.00	0.00	12.20	
		SANTA CLARA	0.00	0.00	0.00	1.10	2.20	14.10	38.00	0.00	0.00	53.40	
		SANTA CRUZ	3.70	0.00	0.00	0.47	4.50	0.00	0.26	0.00	0.68	8.80	
		MONTEREY	0.00	0.00	0.00	0.00	2.70	0.16	0.00	0.00	0.00	2.86	
		SAN BENITO	0.19	1.20	5.00	0.88	12.00	0.00	0.00	0.00	0.00	18.10	
		MONTEREY	0.00	0.00	0.00	0.12	3.60	55.80	15.10	0.27	0.07	74.80	
		SAN BENITO	0.00	0.00	0.00	1.00	32.80	6.70	0.64	0.02	0.00	41.20	
		SAN LUIS OBISPO	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.19	
		MONTEREY	2.70	0.00	0.00	3.10	0.59	2.50	0.17	0.00	0.00	9.10	
SUBTOTAL			7.18	1.24	5.00	11.55	64.09	83.11	54.80	0.28	0.75	229.18	
SOUTH	18090008	MONTEREY	2.80	0.00	0.00	0.00	0.18	18.30	0.03	0.00	0.00	18.80	
SUBTOTAL			2.80	0.00	0.00	0.00	0.18	18.30	0.03	0.00	0.00	18.80	
GRAND TOTAL			18.12	1.24	5.00	15.25	180.65	122.11	386.03	0.28	0.75	724.08	

Source: The National Coastal Pollutant Discharge Inventory, Strategic Environmental Assessment Division, Office of Ocean Resources Conservation and Assessment, National Ocean Service, Rockville, Maryland.

TOTAL NITROGEN (TN), CIRCA 1994
(Thousands of pounds per year)

AREA	HYDROGRAPHIC UNIT	INCLUDED COUNTIES	WASTE WATER TREATMENT PLANTS	POINT SOURCES				NONPOINT SOURCES				UPSTREAM SOURCES	TOTAL	
				INDIRECT INDUSTRIAL PLANTS	POWER PLANTS	URBAN RUNOFF	CROPLAND RUNOFF	FORESTLAND RUNOFF	PASTURE/RANGE	IRRIGATION RETURN FLOW				
NORTH	18050005	MARIN	17.10	0.00	0.00	0.00	7,120.00	481.00	10,690.00	0.00	0.00	0.00	18,288.00	
		SAN FRANCISCO	1,002.00	0.00	0.00	0.00	70.30	0.00	0.00	0.00	0.00	0.00	1,072.00	
		SANTA CRUZ	428.00	0.00	0.00	0.00	182.00	600.00	6,445.00	0.00	0.00	0.00	8,604.00	
SUBTOTAL	18050005		1,447.10	0.00	0.00	0.00	222.30	1,074.60	17,135.00	0.00	0.00	0.00	29,987.80	
		CENTRAL	18060001	SAN MATEO	0.00	0.00	0.00	0.00	728.00	80.20	48.00	0.00	0.00	828.00
		18060002	SANTA CLARA	1,790.00	0.00	0.00	0.00	390.00	140.00	294.60	260.00	0.00	0.00	2,785.00
SUBTOTAL	18060001		388.00	0.00	0.00	0.00	71.80	1,106.00	1,808.00	21.00	0.00	0.00	3,359.00	
		18060011	MONTEREY	0.00	0.00	0.00	0.00	359.00	80.70	0.00	0.00	0.00	0.00	439.70
		18060005	SAN BENITO	58.60	117.00	0.00	0.00	42.40	1,482.00	0.00	0.00	0.00	0.00	1,680.00
SUBTOTAL	18060005		41.00	0.00	0.00	0.00	8.10	3,492.00	18,476.00	5,640.00	1,560.00	38.20	28,646.00	
		18060012	SAN BENITO	694.00	0.00	0.00	0.00	198.00	79.00	281.00	87.00	0.00	0.00	1,280.00
		18060008	MONTEREY	2,808.80	117.00	0.00	0.00	747.10	11,233.00	20,434.80	7,283.00	1,730.00	289.20	44,718.70
SOUTH	18080008		0.85	0.00	0.00	0.00	0.00	22.50	6,112.00	1.10	0.00	0.00	6,136.00	
			0.65	0.00	0.00	0.00	0.00	22.50	6,112.00	1.10	0.00	0.00	6,136.00	
			4,397.25	117.00	0.00	0.00	989.40	20,363.50	27,981.10	24,378.10	1,730.00	289.20	78,822.30	
GRAND TOTAL														

Source: The National Coastal Pollutant Discharge Inventory, Strategic Environmental Assessment Division, Office of Ocean Resources Conservation and Assessment, National Ocean Service, Rockville, Maryland.

TOTAL PHOSPHORUS (TP), CIRCA 1994
(Thousands of pounds per year)

AREA	HYDROGRAPHIC UNIT	INCLUDED COUNTIES	POINT SOURCES										NONPOINT SOURCES					TOTAL
			WASTE WATER TREATMENT PLANTS	DIRECT INDUSTRIAL DISCHARGERS	POWER PLANTS	URBAN RUNOFF	CROP AND FOREST LAND RUNOFF	PASTURE/ RANGELAND	IRRIGATION RETURN FLOW	UPSTREAM SOURCES	PASTURE/ RANGELAND	IRRIGATION RETURN FLOW	UPSTREAM SOURCES					
NORTH	18050005	MARIN	10.90	0.00	0.00	0.00	7.100	4.50	107.00	0.00	0.00	0.00	183.00					
	18050006	SAN FRANCISCO	864.00	0.00	0.00	14.50	0.00	0.00	0.00	0.00	0.00	878.00						
		SAN MATEO	298.00	0.00	0.00	23.00	20.00	6.00	64.00	0.00	0.00	380.00						
		SANTA CRUZ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
SUBTOTAL			1,140.90	0.00	0.00	37.50	91.00	10.70	171.00	0.00	0.00	1,482.20						
CENTRAL	18060001	SAN MATEO	0.00	0.00	0.00	0.00	7.80	0.50	0.50	0.00	0.00	8.80						
		SANTA CRUZ	541.00	0.10	0.00	50.40	6.80	3.30	2.60	0.00	0.00	603.00						
		SANTA CLARA	0.00	0.00	0.00	10.90	21.00	11.00	18.10	0.00	0.00	61.00						
	18060002	SANTA CRUZ	332.00	0.00	0.00	4.80	31.70	0.00	0.20	0.00	0.00	378.00						
		MONTEREY	0.00	0.00	0.00	0.00	9.30	0.51	0.00	0.00	0.00	9.80						
		SAN BENITO	38.40	2.80	0.00	6.50	60.00	0.00	0.00	0.00	0.00	106.70						
	18060011	SAN BENITO	0.00	0.00	0.00	1.20	259.00	185.00	50.40	32.80	1.10	628.00						
		MONTEREY	0.00	0.00	0.00	10.20	50.00	1.70	0.18	2.90	0.00	90.80						
	18060005	SAN LUIS OBISPO	25.60	0.00	0.00	30.10	3.10	2.50	0.57	0.00	0.00	484.00						
		SAN BENITO	448.00	0.00	0.00	113.90	447.30	204.51	72.55	35.50	10.40	2,298.70						
SUBTOTAL	18060012	MONTEREY	1,383.00	2.70	0.00	30.10	3.10	2.50	0.57	0.00	0.00	484.00						
SOUTH	18080006	MONTEREY	0.52	0.00	0.00	0.00	0.87	61.10	0.01	0.00	0.00	62.50						
			0.52	0.00	0.00	0.00	0.87	61.10	0.01	0.00	0.00	62.50						
GRAND TOTAL			2,524.12	2.70	0.00	151.40	639.17	278.31	243.56	36.50	10.40	3,793.40						

Source: The National Coastal Pollutant Discharge Inventory, Strategic Environmental Assessment Division, Office of Ocean Resources Conservation and Assessment, National Ocean Service, Rockville, Maryland.

TOTAL OIL AND GREASE, CIRCA 1984
(Thousands of pounds per year)

AREA	HYDROGRAPHIC UNIT	INCLUDED COUNTIES	POINT SOURCES				NONPOINT SOURCES							TOTAL
			WASTE WATER TREATMENT PLANTS	DIRECT INDUSTRIAL DISCHARGERS	POWER PLANTS	URBAN RUNOFF	CROPLAND RUNOFF	FOREST LAND RUNOFF	PASTURE/RANGE	IRRIGATION RETURN FLOW	UPSTREAM SOURCES			
NORTH	18050006	MARIN	17.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	17.20
		SAN FRANCISCO	2,040.00	0.00	0.00	183.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2,223.00
		SAN MATEO	22.80	0.00	0.00	477.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	700.00
SUBTOTAL	18050006	SANTA CRUZ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		SANTA CRUZ	2,089.00	0.00	0.00	660.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2,749.00
		SUBTOTAL	2,089.00	0.00	0.00	660.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2,749.00
CENTRAL	18060001	SAN MATEO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		SANTA CRUZ	686.00	0.75	0.00	744.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1,430.75
		SANTA CLARA	0.00	0.00	0.00	223.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	223.00
SUBTOTAL	18060002	SANTA CRUZ	704.00	0.00	0.00	85.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	789.20
		MONTEREY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		SUBTOTAL	704.00	0.00	0.00	85.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	789.20
SOUTH	18090011	MONTEREY	86.80	4.20	1,864.00	131.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2,146.00
		SAN BENITO	0.00	0.00	0.00	28.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	28.40
		MONTEREY	41.00	0.00	0.00	206.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	247.00
SUBTOTAL	18090008	SAN LUIS OBISPO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		SAN BENITO	477.00	0.00	0.00	616.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1,093.00
		MONTEREY	2,118.80	4.85	1,864.00	2,033.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6,106.45
GRAND TOTAL	18090008	MONTEREY	1.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.40
		SUBTOTAL	1.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.40
		GRAND TOTAL	4,187.20	4.85	1,864.00	2,683.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8,080.40

Source: The National Coastal Pollutant Discharge Inventory, Strategic Environmental Assessment Division, Office of Ocean Resources Conservation and Assessment, National Ocean Service, Rockville, Maryland.

TOTAL FECAL COLIFORM BACTERIA (FCB), CIRCA 1984
(cubic times billions per year)

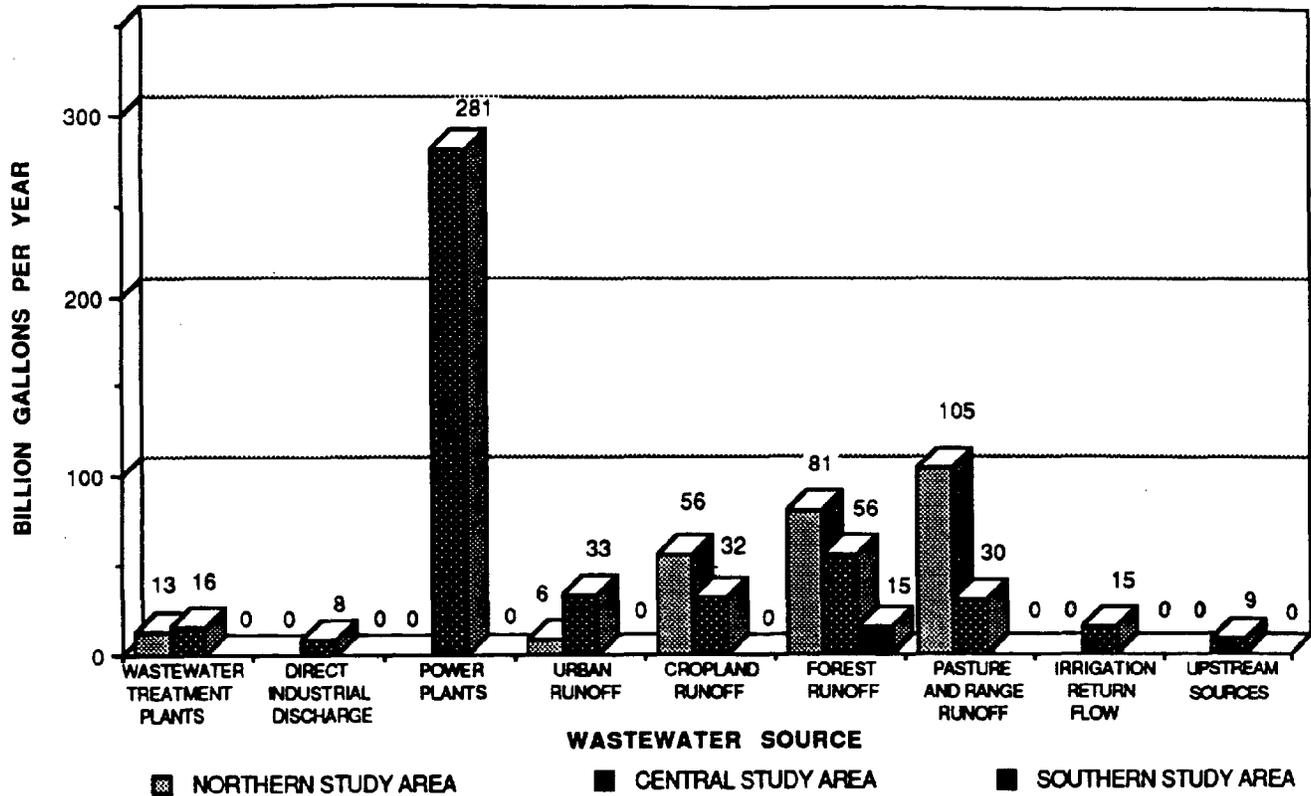
AREA	HYDROGRAPHIC UNIT	INCLUDED COUNTIES	POINT SOURCES				NONPOINT SOURCES						TOTAL
			WASTE WATER TREATMENT PLANTS	DIRECT INDUSTRIAL DISCHARGERS	POWER PLANTS	URBAN RUNOFF	CROPLAND RUNOFF	FOREST LAND RUNOFF	PASTURE/RANGE	IRRIGATION RETURN FLOW	UPSTREAM SOURCES		
NORTH	18050005 18050006	MARIN	1.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.40
		SAN FRANCISCO	6,020.00	0.00	0.00	12,500.00	0.00	0.00	0.00	0.00	0.00	0.00	18,520.00
		SAN MATEO	34.50	0.00	0.00	2,820.00	0.00	0.00	0.00	0.00	0.00	0.00	2,854.50
SUBTOTAL		SANTA CRUZ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			6,055.90	0.00	0.00	15,320.00	0.00	0.00	0.00	0.00	0.00	0.00	21,375.90
CENTRAL	18060001 18060002	SAN MATEO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		SANTA CRUZ	3,707.00	0.00	0.00	5,840.00	0.00	0.00	0.00	0.00	0.00	0.00	9,547.00
		SANTA CLARA	0.00	0.00	0.00	1,478.00	0.00	0.00	0.00	0.00	0.00	0.00	1,478.00
		SANTA CRUZ	2,320.00	0.00	0.00	628.00	0.00	0.00	0.00	0.00	0.00	0.00	2,948.00
		MONTEREY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		SAN BENITO	4.70	0.33	0.00	978.00	0.00	0.00	0.00	0.00	0.00	0.00	983.03
SUBTOTAL	18060011 18060005	MONTEREY	0.00	0.00	0.00	214.00	0.00	0.00	0.00	0.00	0.00	0.00	214.00
		SAN BENITO	0.00	0.00	0.00	1,840.00	0.00	0.00	0.00	0.00	0.00	0.00	1,840.00
		SAN LUIS OBISPO	3.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.30
SUBTOTAL	18060012	MONTEREY	432.00	0.00	0.00	4,940.00	0.00	0.00	0.00	0.00	0.00	0.00	5,372.00
		SAN BENITO	0.467.00	0.33	0.00	16,011.00	0.00	0.00	0.00	0.00	0.00	0.00	16,478.33
		MONTEREY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SOUTH	18080008	MONTEREY	47.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	47.00
			47.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	47.00
			12,589.90	0.33	0.00	31,440.00	0.00	0.00	0.00	0.00	0.00	0.00	44,121.90
GRAND TOTAL													

Source: The National Coastal Pollutant Discharge Inventory, Strategic Environmental Assessment Division, Office of Ocean Resources Conservation and Assessment, National Ocean Service, Rockville, Maryland.

FIGURE D-2

Figure D-2 illustrates in graphic form the data provided in Table D-2 for the pollutant constituents total wastewater flow, total lead, total suspended sediments, and total nitrogen.

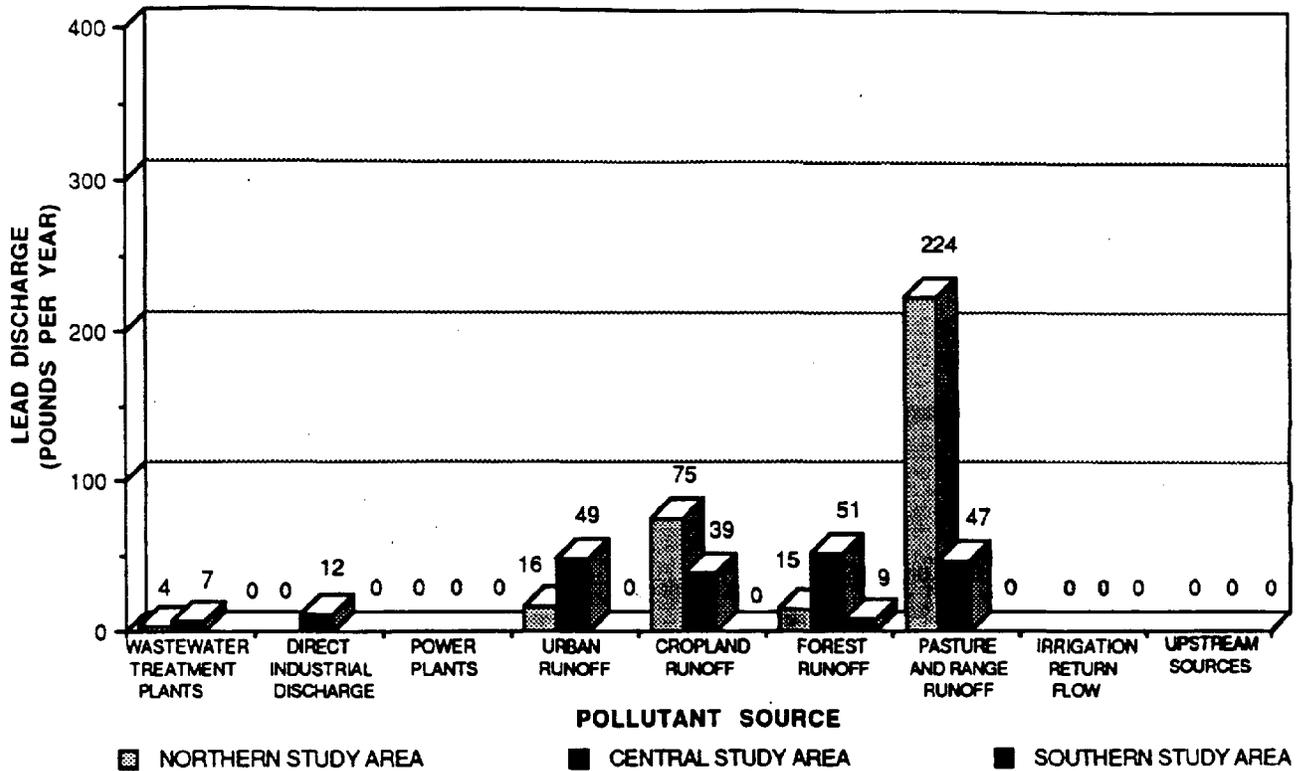
Total Wastewater, by Hydrologic Unit and County, Discharged Into Areas Adjacent to the Monterey Bay National Marine Sanctuary Study Areas, by Source, circa 1990



Note: Power plants discharge large volumes of wastewater as a result of cooling water requirements. However, the mass of pollutants discharged from power plants is generally small.

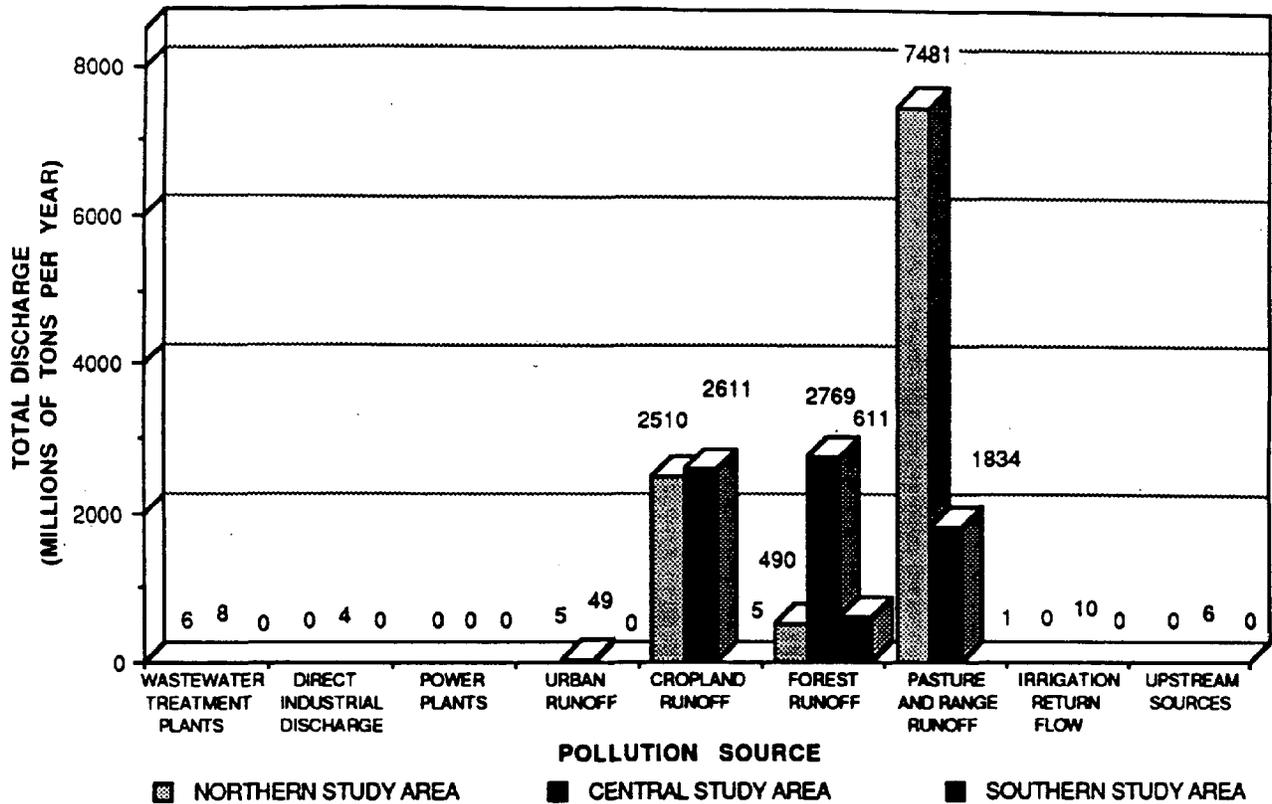
Source: National Coastal Pollutant Discharge Inventory, Office of Ocean Resource Conservation and Assessment, National Ocean Service, Rockville, Maryland.

**Total Lead, by Hydrologic Unit and County, Discharged into Adjacent Areas
Under Consideration for the Monterey Bay National Marine Sanctuary
Study Areas, by Source, circa 1984**



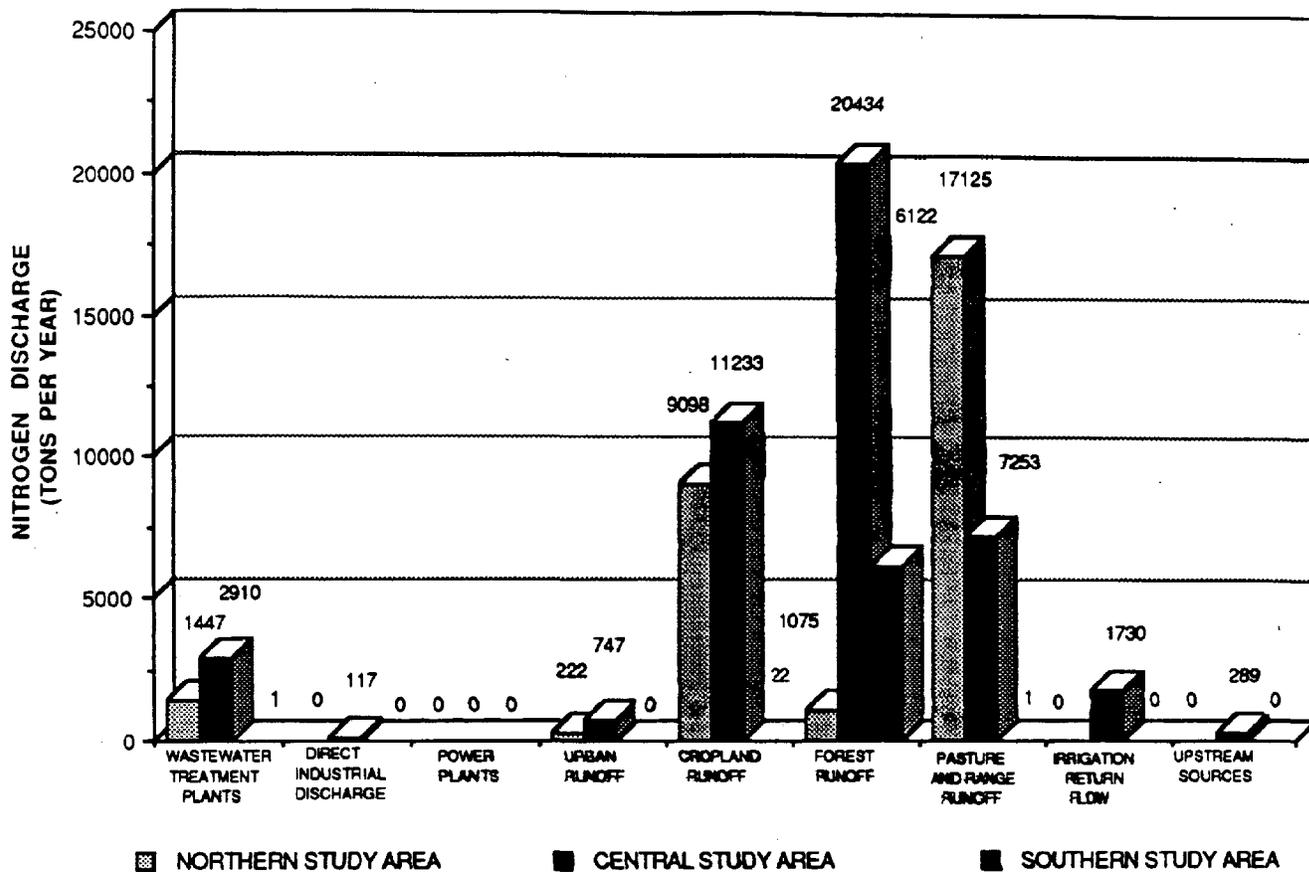
Source: National Coastal Pollutant Discharge Inventory, Office of Ocean Resources
Conservation and Assessment, National Ocean Service, Rockville, Maryland.

Total Volume, by Hydrologic Unit and County, of all Suspended Sediments Discharged into Adjacent Areas Under Consideration for the Monterey Bay National Marine Sanctuary, Study Areas by Source, circa 1984



Source: National Coastal Pollutant Discharge Inventory, Office of Ocean Resource Conservation and Assessment, National Ocean Service, Rockville, Maryland.

**Total Nitrogen, by Hydrologic Unit and County, Discharged into
Adjacent Areas Under Consideration for the
Monterey Bay National Marine Sanctuary,
by Source, circa 1984**



POLLUTANT SOURCE

Source: National Coastal Pollutant Discharge Inventory, Office of Ocean Resources
Conservation and Assessment, National Ocean Service, Rockville, Maryland.

APPENDIX E:

ABBREVIATIONS

Abbreviations

AMBAG - Association of Monterey Bay Area Governments

APPS - Act to Prevent Pollution from Ships (33 U.S.C. §§ 1901 et seq.)

ARB - Air Resources Board

ASBS - Areas of Special Biological Significance

BLM - Bureau of Land Management, Department of the Interior

CBNMS - Cordell Bank National Marine Sanctuary

CCA - California Coastal Act

CERCLA - Comprehensive Environmental Response, Compensation and Liability Act

CDF&G - California Department of Fish and Game

CDP&R - California Department of Parks and Recreation

COE - U.S. Corps of Engineers

CWA - Clean Water Act (33 U.S.C. §§ 1251 et seq.)

DOD - Department of Defense

EIS - Environmental Impact Statement

EPA - Environmental Protection Agency

ESA - Endangered Species Act (16 U.S.C. §§ 1531-1543)

ESNERR - Elkhorn Slough National Estuarine Research Reserve

FAA - Federal Aviation Authority

FMP - Fishery Management Plan

FWS - Fish and Wildlife Service, Department of the Interior

GFNMS - Gulf of the Farallones National Marine Sanctuary

GGNRA - Golden Gate National Recreation Area

LRA - List of Recommended Areas

MBNMS - Monterey Bay National Marine Sanctuary

MEMD - Marine and Estuarine Management Division, NOAA, DOC,
Previously the Sanctuary Programs Division (SPD)

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

MMS - Minerals Management Service, Department of the Interior

MMPA - Marine Mammal Protection Act (16 U.S.C. §§ 1361 et seq.)

MP - Management Plan

MPRSA - Marine Protection, Research, and Sanctuaries Act (33 U.S.C.
§§ 1401 et seq. and 16 USC §§ 1431 et seq.)

NAS - National Academy of Sciences

NERR - National Estuarine Research Reserve

NMFS - National Marine Fisheries Service, NOAA, Department of
Commerce

NOAA - National Oceanic and Atmospheric Administration, Department
of Commerce

NPDES - National Pollutant Discharge Elimination System

NPS - National Park Service, Department of the Interior

NRP - National Research Plan (MEMD)

OCS - Outer Continental Shelf

OCSLA - Outer Continental Shelf Lands Act (43 U.S.C. §§ 1331 et
seq.)

PG&E - Pacific Gas and Electric

PFMC - Pacific Fisheries Management Council

PRBO - Point Reyes Bird Observatory

PRNMS - Point Reyes-Farallon Islands National Marine Sanctuary

PRNS - Point Reyes National Seashore

RWQCB - Regional Water Quality Control Board

PWSA - Ports and Waterways Safety Act (33 U.S.C. §§ 1221 et seq.)

RFP - Request for proposals

SAC - Sanctuary Advisory Committee

SEL - Site Evaluation List

SPD - Sanctuary Programs Division, NOAA, Department of Commerce,
now called Marine and Estuarine Management Division (MEMD)

SRP - Sanctuary Research Plan

SWRCB - State Water Resources Control Board

USCG - United States Coast Guard, Department of Transportation

VTSS - Vessel Traffic Separation Scheme (USCG)

WDR - Waste Discharge Requirement

RESPONSE TO COMMENTS

**Monterey
Bay
National
Marine
Sanctuary**

**Final Environmental
Impact Statement/
Management Plan**

Volume II: Response to
Comments on the Draft EIS/MP



U.S. Department of Commerce

National Oceanic and
Atmospheric Administration

Sanctuaries and
Reserves Division



**Monterey
Bay
National
Marine
Sanctuary**

Volume II:
Responses to
Comments Raised
by the DEIS/MP

United States Department of Commerce
August 1991

Prepared By:

Sanctuaries and Reserve Division

Office of Ocean and Coastal Resource Management

National Ocean Service

National Oceanic and Atmospheric Administration
1825 Connecticut Avenue, NW, Suite 714
Washington, D.C. 20235

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Introduction

Volume II, *Response to Comments Raised by the DEIS/MP*, summarizes the comments received on the Draft Environmental Impact Statement/Management Plan prepared for the proposed Monterey Bay National Marine Sanctuary. This document provides the National Oceanic and Atmospheric Administration (NOAA) with the opportunity to respond to these comments in a comprehensive manner.

On November 7, 1988, Public Law No. 100-627 directed the Secretary of Commerce to designate the Monterey Bay National Marine Sanctuary. This directive automatically advanced Monterey Bay to active Sanctuary candidate status. In 1989, two public scoping meetings were held and response was favorable to proceed with the DEIS/MP. The DEIS/MP was completed and released to the public on August 3, 1991. The document proposed the establishment of a National Marine Sanctuary centered on Monterey Bay to facilitate the long-term management and protection of its resources. Specifically, the DEIS/MP presented boundary and regulatory alternatives and environmental consequences of each choice. It also provided details on the most important Sanctuary resources and uses.

The Sanctuaries and Reserve Division received over 1,200 written comments during the 60-day period between August 3 and October 3, 1991 from individuals, organizations, industry, and State and Federal government. In addition, over 200 statements were presented at three public hearings held on the following dates:

September 12, 1991: Monterey City Hall
Monterey, California

September 13, 1991: Veterans Hall Auditorium
Santa Cruz, California

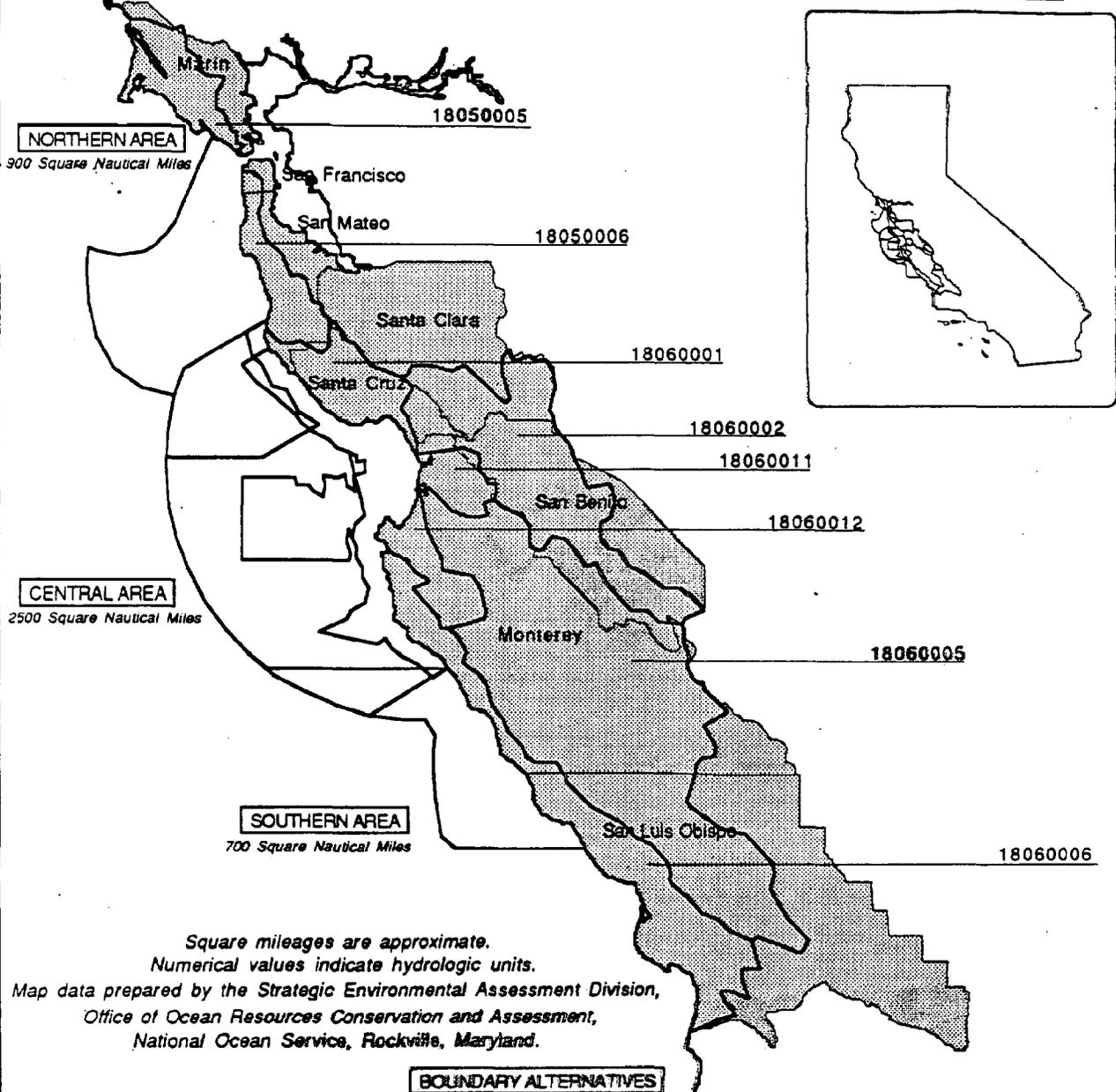
September 14, 1991: Half Moon Bay Community
Seniors Center
Half Moon Bay, California.

These comments contributed to the evolution of NOAA's policies concerning the proposed Sanctuary. This volume clarifies the issues expressed by the commentators, and presents NOAA's position on proposed activities in the Monterey Bay National Marine Sanctuary.

All letters, documents, and scientific papers were read and divided into five categories: individuals, government, organizations, industry, and public hearing transcripts. Each comment was carefully analyzed and grouped into one of seventeen issues. NOAA's response is printed across from each comment.

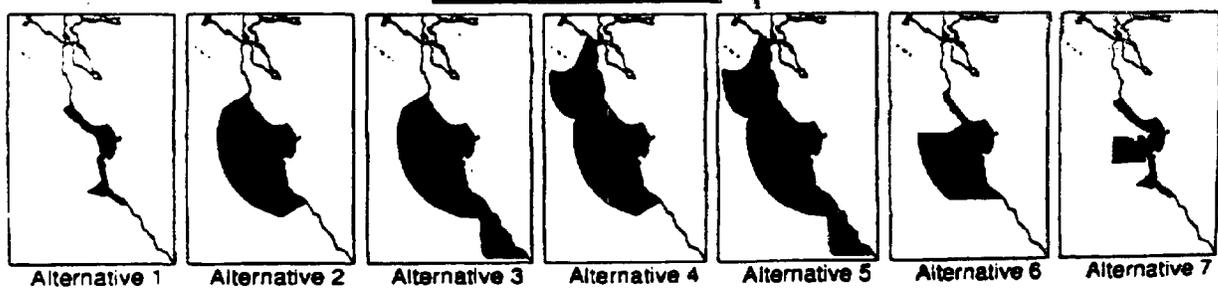
Table 1 shows issues raised by government officials and agencies, organizations, and industry. Their letters are located in the back of this volume. Individuals who commented on the Monterey Bay National Marine Sanctuary are listed in Table 5.

MONTEREY BAY SANCTUARY BOUNDARIES, ANALYSIS AREAS, ADJACENT COUNTIES, AND HYDROLOGIC UNITS



*Square mileages are approximate.
 Numerical values indicate hydrologic units.
 Map data prepared by the Strategic Environmental Assessment Division,
 Office of Ocean Resources Conservation and Assessment,
 National Ocean Service, Rockville, Maryland.*

BOUNDARY ALTERNATIVES



Alternative 1 Alternative 2 Alternative 3 Alternative 4 Alternative 5 Alternative 6 Alternative 7

Table 1. Issues Raised by Gvt. Officials, Gvt. Agencies, Organizations, and Agencies

	Sanctuary Boundary	Hydrocarbon Development	Vessel Traffic	Oil Spill Contingency Response Plan	Deposit and Discharge Activities	Air of and Contact on the Seabed	Key and Aquaculture	Harbor Exclusion
Government Officials								
Assemblyman Sam Barnes	X	X	X	X				
Assemblyman Sam Fair	X		X	X	X			
Assemblyman Ted Lampert	X	X	X	X	X			
Assemblywoman K. Jacqueline Speler	X							
California Attorney General John Van De Kamp	X	X			X			
California Governor George Duke Meijer	X		X		X	X		
State Senator Morrison	X							
State Senator Henry J. Mello	X	X		X				
State Senator Milton Marks	X							
State Senator Quentine Kopp	X				X			
State Senator Rebecca Morgan	X				X			
U.S. Representative Leon E. Panetta	X	X	X		X			
U.S. Representative Tom Campbell	X	X			X			
U.S. Representative Tom Lantos	X	X	X					
U.S. Senator Pete Wilson	X	X	X					
Total for Government Officials	15	8	7	4	8	4	0	0
Government Agencies								
Association of Monterey Bay Area Governments (AMBAG)	X	X	X	X	X	X		
California Air Resources Board					X			
California Coastal Commission	X	X	X	X	X	X		X
California Department of Fish and Game	X				X	X	X	
California Department of Parks and Recreation	X		X	X				
California Department of Transportation					X			
California Regional Water Quality Control Board					X			
California State Lands Commission								
City of Capitola	X	X	X		X	X		
City of Carmel-By-The-Sea	X				X			
City of Gilroy					X	X		
City of Half Moon Bay	X	X	X		X			
City of Marina	X	X	X		X	X		
City of Monterey	X	X	X		X	X		X
City of Morgan Hill					X	X		
City of Pacific Grove	X	X	X		X	X		
City of Pacifica	X	X			X			
City of San Francisco	X				X			
City of San Mateo			X		X			
City of Santa Cruz	X	X	X	X	X	X		
City of Scotts Valley	X	X	X					
City of Seaside	X	X			X			
City of Watsonville					X			
Corps of Engineers					X	X		
County Sanitation District of L.A. County					X	X		
Department of the Army					X	X		
Department of the Navy					X	X		
Environmental Protection Agency	X			X	X	X		
Landels-Hill Big Creek Reserve	X				X			
Marina County Water District					X			
Monterey Bay Unified Air Control District					X	X		
Monterey County	X	X	X		X			
Monterey County Agricultural Commission					X	X		
Monterey Peninsula Regional Park District	X	X	X		X			
Monterey Peninsula Water Management District	X				X			
Monterey Regional Water Pollution Control Agency					X			
Pescadero Community Council	X	X			X			
San Francisco County	X							
San Luis Obispo County	X							
San Mateo County	X	X	X		X			
San Mateo County Harbor District						X		X
Santa Cruz County	X	X	X	X	X			X
Santa Cruz Port District	X					X		X
U.S. Department of the Interior								
Total for Government Agencies	28	18	18	8	38	18	1	8

Table 1 cont. Issues Raised by Govt. Officials, Govt. Agencies, Organizations, and Agencies

Organizations	Sanctuary Boundary	Hydrocarbon Development	Vessel Traffic	Oil Spill Contingency Response Plan	Deposit and Discharge Activities	Air of and Contact on the Seabed	Help and Agriculture	Nearshore Exclusion
American Cetacean Society	X	X			X	X		
Beresford-Hillside Homeowners Association	X							
Big Stick Serving Association	X							
California Native Plant Society	X		X					
California State Park Rangers Association	X							
Center for Marine Conservation	X	X	X		X	X		X
Central California Council of Diving Clubs, Inc.		X	X		X	X		X
Central California Wildlife Federation	X		X					
Central Coast Agricultural Task Force					X			
Central Coast Conservation Center	X	X			X			
Central Coast OCS Regional Studies Program	X	X	X		X	X		
Coastal Concerns	X	X	X			X		
Coyote Point Museum	X							
Defenders of Wildlife	X	X	X		X	X		
Elkhorn Slough Foundation	X		X					
Elkhorn Slough Interpretive Guides Association	X	X	X		X	X		
Friends of Prince William Sound	X	X	X					
Friends of the Sea Otter	X	X	X	X	X	X		
Gatekeepers to the Future	X							
Golden Gate Audubon Society	X	X	X	X				
Half Moon Bay Fishermans Marketing Association		X			X			
Institute of Marine Science, UCSC	X	X	X					
La Honda Watershed Council	X	X	X					
Landside-Hill Big Creek Reserve	X							
League of Women Voters (Regional & National)	X	X	X		X			
Monterey Bay Aquarium	X							
Monterey Bay Dunes Coalition					X			
Monterey Bay Teachers Association	X							
Monterey Peninsula Audubon Society			X		X			
Moss Landing Marine Laboratory, Student Body	X	X	X		X	X		
National Audubon Society								
Natural Resources Defense Council			X	X				
Northern Coast Boys		X						
Ocean Alliance	X	X	X		X			
Ocean Protection Coalition	X	X	X		X	X		
Pacific Coast Federation of Fishermans Associations	X	X			X			
Pacific Grove Museum of Natural History Association	X	X	X		X	X		
San Mateo Humane Society	X							
Santa Cruz SPCA	X							
Save Our Shores	X	X	X	X	X	X		
Sierra Club (Regional & National)	X	X	X	X	X			
Surfrider Foundation	X	X						
Ventana Wilderness Sanctuary	X	X	X					
Wilderness Society (Regional & National)	X	X	X		X	X		
Total for Organizations	38	28	25	5	21	13	0	2
Industry								
Arredia Development Co.					X			
E.R. & Associates	X		X	X	X	X		
Glen-Loma Group					X			
Kelco	X						X	
Mendocino Sea Vegetable Company	X							
Noland, Hamerly, Eitanne & Moss					X			
Pacific Gas & Electric Company			X		X	X		X
Santa Cruz Sealside Company	X	X	X		X			
U.S. Abalone							X	
Total for Industry	4	1	3	1	7	2	2	1
Combined Total: Govt., Organizations, Industry	81	81	80	10	71	38	3	8

Table 1 cont. Issues Raised by Gvt. Officials, Gvt. Agencies, Organizations, and Agencies

	Linkage w/ Elkhorn Slough	Research Development	Nutrient Red. Protection	Timing of Marine Mammal Resights	Fishing Activities	Motorized Aircraft	Thrift Craft	Sanctuary Management	Military Activities
Government Officials									
Assemblyman Sam Barnes		X					X	X	
Assemblyman Sam Farr							X	X	
Assemblyman Ted Lempert			X						
Assemblywoman K. Jacqueline Speier									
California Attorney General John Van De Kamp							X		X
California Governor George Deukmejian			X	X		X			
State Senator Morrison									
State Senator Henry J. Mello				X					
State Senator Milton Marie									
State Senator Quentin Kopp									
State Senator Rebecca Morgan									
U.S. Representative Leon E. Panetta					X			X	X
U.S. Representative Tom Campbell									
U.S. Representative Tom Lantos									
U.S. Senator Pete Wilson									
Total for Government Officials	0	1	2	2	1	1	3	3	2
Government Agencies									
Association of Monterey Bay Area Governments (AMBAG)			X	X		X	X	X	
California Air Resources Board		X							
California Coastal Commission		X	X	X		X	X	X	
California Department of Fish and Game	X			X	X	X		X	
California Department of Parks and Recreation									
California Department of Transportation	X	X							
California Regional Water Quality Control Board									
California State Lands Commission			X						
City of Capitola			X	X		X	X		
City of Carmel-By-The-Sea									
City of Gilroy									
City of Half Moon Bay						X	X		
City of Marina				X		X	X	X	
City of Monterey			X	X		X	X	X	
City of Morgan Hill									
City of Pacific Grove			X	X		X	X	X	
City of Pacifica									
City of San Francisco									
City of San Mateo									
City of Santa Cruz			X	X		X		X	
City of Scotts Valley									
City of Seaside									
City of Watsonville									
Corps of Engineers									
County Sanitation District of L.A. County									
Department of the Army		X				X			X
Department of the Navy									X
Environmental Protection Agency							X		
Lands-Hill Big Creek Reserve									
Marina County Water District									
Monterey Bay Unified Air Control District									
Monterey County	X	X	X	X		X	X	X	
Monterey County Agricultural Commission	X							X	
Monterey County Water Management District									
Monterey Peninsula Regional Park District			X	X		X	X	X	
Monterey Peninsula Water Management District									
Monterey Regional Water Pollution Control Agency									
Pescadero Community Council									
San Francisco County									
San Luis Obispo County									
San Mateo County									
San Mateo County Harbor District					X				
Santa Cruz County					X		X	X	
Santa Cruz Port District					X		X	X	
U.S. Department of the Interior				X			X		
Total for Government Agencies	4	5	9	11	4	12	13	12	2

Table 1 cont. Issues Raised by Gvt. Officials, Gvt. Agencies, Organizations, and Agencies

	Linkages w/ Elkhorn Slough	Mariculture Development	Historic Res. Preservation	Timing of Marine Mammal Rescues	Fishing Activities	Motorized Aircraft	THM Craft	Sanctuary Management	Military Activities
Organizations									
Audobon Society					X				
American Catacean Society			X	X	X	X	X	X	
Beresford-Hilldale Homeowners Association									
Big Stick Serving Association									
California Native Plant Society							X	X	
California State Park Rangers Association									
Center for Marine Conservation		X	X	X	X	X	X	X	
Central California Council of Diving Clubs, Inc.				X	X		X	X	
Central California Wildlife Federation								X	
Central Coast Agricultural Task Force									
Central Coast Conservation Center									
Central Coast OCS Regional Studies Program	X	X	X	X		X	X	X	
Coastal Concerns									
Coyote Point Museum									
Defenders of Wildlife									X
Elkhorn Slough Foundation	X						X	X	
Elkhorn Slough Interpretive Guides Association	X		X	X	X	X	X	X	
Friends of Prince William Sound									
Friends of the Sea Otter				X		X	X	X	
Gatekeepers to the Future					X				
Golden Gate Audubon Society							X		
Half Moon Bay Fishermans Marketing Association					X				
Institute of Marine Science, UCSC					X				
La Honda Watershed Council							X		
Landside-Hill Big Creek Reserve									X
League of Women Voters (Regional & National)					X		X	X	
Monterey Bay Aquarium									X
Monterey Bay Dunes Coalition		X							
Monterey Bay Teachers Association									
Monterey Peninsula Audubon Society									
Moss Landing Marine Laboratory, Student Body			X	X		X	X		
National Audubon Society					X				
Natural Resources Defense Council									
Northern Coast Boys									
Ocean Alliance					X		X		
Ocean Protection Coalition			X	X	X	X	X		
Pacific Coast Federation of Fishermans Associations				X	X				
Pacific Grove Museum of Natural History Association			X	X		X	X		
San Mateo Humane Society									
Save Our Shores			X	X		X	X	X	
Sierra Club (Regional & National)		X			X		X	X	
Sunrider Foundation					X				
Ventana Wilderness Sanctuary									
Wilderness Society (Regional & National)			X	X			X	X	
Wilderness Society of CA & Northeast Regional Office						X			
Total for Organizations	3	3	9	12	15	10	18	16	0
Industry									
Arredia Development Co.					X				
E.J. & Associates									
Glen-Loma Group									X
Kelco					X				
Mendocino Sea Vegetable Company									
Noland, Hamerly, Etienne & Hoss									X
Pacific Gas & Electric Company									
Santa Cruz Seaside Company									
U.S. Abalone									
Total for Industry	0	0	0	0	2	0	0	2	0
Combined Total: Gvt., Organizations, Industry	7	3	9	12	17	10	18	18	0

Issue 1: Sanctuary Boundary

Comment**NOAA Response****Boundary Alternatives/Extensions****Boundary Alternatives/Extensions**

NOAA should extend its preferred Boundary Alternative because a northern extension (Alternative 4) would: 1) protect the critical nesting and migratory paths between Monterey County and the San Mateo coast; 2) create a continuous interrelated zone offshore between Monterey Bay and the Gulf of the Farallones Marine Sanctuary; 3) restrict or prohibit industrial activity that threatens the Sanctuary, particularly oil and gas activities, and 4) provide a sufficient buffer for Año Nuevo from threats such as hydrocarbon development and vessel traffic, and 5) provide additional protection to the Fitzgerald Marine Reserve which protects a diverse intertidal invertebrate community.

NOAA's preferred boundary is Alternative 2. This alternative was chosen because it integrates important coastal, nearshore, and deep-ocean canyon resource zones under one management regime. These zones include Monterey Bay; the Big Sur coastal area; Año Nuevo; the adjacent continental shelf, slope, and rise; certain highly productive shoreline and intertidal areas such as Pescadero Marsh and Elkhorn Slough; and the deep ocean environments of the Ascension, Monterey Bay, Big Sur, and Partington Canyon complexes. The Monterey Submarine Canyon is the focal point of the Sanctuary. Extensions will not significantly incorporate additional natural resources associated with the Canyon that warrant Sanctuary protection.

A southern extension (Boundary Alternative 3) would: 1) provide additional protection to the extensive kelp beds found in the region; 2) encompass more than three-quarters of the sea otter range; and 3) preserve an undeveloped and significant natural area before it is adversely affected by human impact.

Although a northern extension would provide additional protection from oil and gas activities, it would also adversely affect numerous other human uses. The offshore area is trafficked heavily by vessels entering and exiting San Francisco Bay, and is used for dumping and dredging activities by the Corps of Engineers. Extensive military activities occur in this area, as well as underwater submarine training operations. Finally, this area is heavily impacted by both point and nonpoint source pollution, primarily from the urbanized areas of northern coastal San Mateo and San Francisco counties.

An extension both north and south (Alternative 5) would provide full protection for the reasons stated above.

A southern extension would provide minimal additional protection to the existing resources and pristine habitats while furthering Sanctuary management costs for enforcement and other related activities. These resources are adequately protected by existing management authorities and are not under any immediate or long-term threat from harmful human activities.

Extending the Sanctuary to Alternative 5 would decrease its manageability and be too costly to provide for adequate enforcement, surveillance, education, and research.

The DEIS does not provide adequate analysis for each boundary alternative. The evidence NOAA presents does not adequately support its preference

The final document (FEIS) has been substantially revised to present an analysis of all boundary alternatives.

Comment

for Alternative 2. The DEIS states that Boundary Alternative 5 is unwieldy from a management perspective and too costly for adequate enforcement measures. This statement needs to be supported. Based on relative costs and benefits, boundary alternative analyses should examine the possibility of not including certain areas within the Sanctuary.

NOAA should develop cooperative agreements with responsible State agencies to accomplish comparable management goals.

Central Coast Sanctuary Proposal

A nomination package should be prepared for a Central Coast National Marine Sanctuary, from Big Sur south to Santa Barbara County. Boundary Alternative 4 should be chosen for the Monterey Sanctuary, so a separate southern sanctuary can be justified in the future.

Definition of the Term "Buffer"

NOAA should clarify the term "buffer" and discuss its relationship to the preferred boundary, sensitive Sanctuary resources within and outside the boundary, and regulatory authority. If a resource is important enough to be included in such a zone, it is important enough to be within the Sanctuary itself.

Buffer Zone Dimensions and Regulations

A 30-mile contiguous buffer zone around the Sanctuary boundary should be created where oil and gas exploration and development activities would be prohibited to ensure protection of marine resources. This zone should have enforceable regulations to prohibit Outer Continental Shelf (OCS) related activities.

NOAA Response

NOAA will work closely with agencies through arrangements such as Memorandums of Agreements (MOAs), between Federal, State, regional, and local management and regulatory agencies to ensure Sanctuary resources and qualities are protected.

Central Coast Sanctuary Proposal

A nomination package has been submitted to NOAA that includes Morro Bay and the Central California Coast. Morro Bay is included in NOAA's Site Evaluation List (SEL) and is eligible for future consideration for active candidate status as a National Marine Sanctuary.

Definition of the Term "Buffer"

The term "buffer" has been clarified in the FEIS. The preferred Sanctuary boundaries are designated to encompass sensitive resources and to provide an adjacent area (buffer) within the Sanctuary boundary where potentially harmful human activities would be under Sanctuary jurisdiction.

Buffer Zone Dimensions and Regulations

In 1990, President Bush announced that oil and gas activities would be prohibited indefinitely within the preferred Sanctuary boundary. Further, the President said that no oil and gas development will occur outside the proposed Sanctuary in the Central California Planning Area until after the year 2000 when the analysis of environmental studies conducted in the area will be completed. NOAA proposed a MOA with the Minerals Management Service (MMS) to enhance coordination between both agencies during future exploration, production, and development activities to minimize the threats of oil and gas development to Sanctuary resources and qualities. However, MMS recommended the decision to adopt any such MOA be deferred until after the year 2000. In the interim, NOAA and MMS will continue to explore ways that existing regulatory authorities, relationships, and coordinating mechanisms can be strengthened and enhanced to work more effectively.

Issue 2: Hydrocarbon Development

Comment

Regulation and Prohibition

Oil and gas development within the Sanctuary should either be prohibited or regulated. Concerns range from impacts of potential toxic wastes released from oil-drilling platforms, reduced tourism due to diminished scenic views, lack of adequate emergency oil response capabilities, to catastrophic blow outs.

Activities In State Waters

The Governor of California recently requested and secured the deletion of Monterey Bay and adjacent areas from oil and gas leasing activities. All state waters within this region, including the Bay proper, now fall within a State Oil and Gas Sanctuary in which oil and gas activities are prohibited.

Impacts

The potential impacts of oil and gas activities are not clearly analyzed in the Draft Environmental Impact Statement (DEIS). The FEIS should examine direct, indirect, and cumulative impacts on all proposed boundary alternatives.

NOAA Response

Prohibition and Regulation

NOAA will prohibit exploring for, developing, or producing oil, gas or minerals in the Sanctuary.

Activities In State Waters

NOAA's proposed oil and gas prohibition covers all State and Federal waters within the Sanctuary, and thus overlaps with the current prohibition in State waters. However, the State can revise this prohibition at any time. NOAA's prohibition will ensure long-term protection of both State and Federal waters.

Impacts

The FEIS includes an analysis of Sanctuary impacts on all resources and uses (including oil and gas) for all boundary alternatives.

Issue 3: Vessel Traffic

Comment

Regulation and Prohibition

NOAA should either regulate or prohibit vessel traffic within the Sanctuary area. Specifically: 1) traffic should be prohibited unless vessels are bound for a destination within the Sanctuary; 2) size of vessels to be regulated or prohibited from the Sanctuary area should be clarified; 3) vessels should either be routed offshore and avoid the Sanctuary area completely, or traffic lanes should be developed along the Sanctuary edges; and 4) vessels traveling along the Sanctuary boundaries should be limited to specific port access routes and shipping lanes established by the United States Coast Guard (USCG) and NOAA.

A 10-year moratorium on vessel traffic within the Sanctuary should be imposed until double hulls becomes standard and adequate contingency and emergency response plans are in place. Vessels that are Sanctuary-bound and carrying hazardous cargo should be required to have special designs such as double hulls.

NOAA Response

Regulation and Prohibition

NOAA has included vessel traffic regulation in the scope of regulation, and will determine appropriate levels of regulation after designation in consultation with the USCG, State agencies, and the International Maritime Organization (IMO) through the USCG

Since publication of the DEIS, both the State and Federal governments have passed comprehensive legislation regarding protection of the environment from vessel traffic. For example, The National Oil Pollution Act of 1990 establishes double hull requirements for tank vessels. Most tank vessels over 5,000 gross tons will be required to have double hulls by 2010, while vessels under 5,000 gross tons will be required to have a double hull or a double containment system by 2015. All newly constructed tankers must contain a double hull (or double containment system if under 5,000 gross tons), while existing vessels are phased out over a period of years. The following is a chart showing sample phase-out years:

Year Built (Sample years in multi-year increments; Act in one-year increments)	Phase Out Dates for Vessel Size Categories (Gross tons in thousands)		
	5-15	15-30	More than 30
1955	1995	1995	1995
1965	2000	1999	1995
1970	2005	2000	1997
1980	2005	2005	2003

NOAA believes that the intent of a 10-year moratorium is already adequately addressed by the 1990 Oil Pollution Act. The Act also mandates that tank vessel and facility contingency plans are prepared for a worst-case discharge, and vessel plans must be reviewed and approved by the USCG. Also, a new California law, SB 2040, California's Oil Spill Prevention and Removal Act, states that no tanker may use any terminal in the State after January 1, 2000, unless the vessel is double hulled. SB 2040 also requires that while entering, leaving, or navigating in the harbor, large tankers be accompanied by a

Comment

No vessels containing nuclear materials or hazardous wastes should be allowed within the Sanctuary boundary, thus establishing the MBNMS as a nuclear-free zone.

Vessels must be allowed to travel to and from Pacific Gas & Electric's (PG&E) Moss Landing Terminal. Therefore, hydrocarbon transport within the Sanctuary should be prohibited except to and from port terminals. Tankers should either be escorted by tugboats, or should have captains on deck while in the Sanctuary. Port access routes for smaller tankers traveling to and from Moss Landing should be analyzed and clarified, and port access routes to San Francisco Bay should be maintained.

There should be no blanket restrictions imposed on oil tankers and barge traffic. Commercial vessel regulation should be carefully crafted so as to not preclude the safe operation of such traffic in the future.

Communities south of Monterey Bay have seriously considered water tankering from Canada. These tankers should be regulated separately from those carrying cargo. This issue should be addressed in the FEIS.

With NOAA allowing vessel traffic in the Sanctuary, only partial protection of natural resources is provided. This does not satisfy the necessary protection based on the requirements of NEPA and the MPRSA.

Vessel Traffic Monitoring

Monitoring vessel traffic along the coast may be difficult. A monitoring system should be established which is compatible between public agencies and the USCG.

NOAA Response

tugboat or tugboats, except under those circumstances where the harbor safety committee finds that tug escorts are not beneficial. To assure safety and compliance, SB 2040 requests a review and evaluation of the pilotage groups, the USCG, and the maritime industry.

All vessels will be reviewed by NOAA and the USCG to determine appropriate action.

The PG&E plant at the Moss Landing terminal will continue operations. The plant contracts with a tug boat service that takes a mooring master to the tanker where he/she stays until the tanker docks at the marine terminal. Port access routes in the Monterey Bay area and San Francisco Bay will be maintained.

NOAA agrees. In working with the Coast Guard and IMO on appropriate vessel traffic regulations, NOAA intends to develop regulations so as to: 1) not restrict innocent passage or impact foreign and domestic traffic; 2) consider the needs of ports in the Sanctuary; and 3) protect the natural resources and qualities within the Sanctuary.

NOAA will consider the threats from all vessels including water tankers as part of the analysis.

NOAA believes that the requirements of NEPA and the MPRSA have been met. The EIS and Management Plan were prepared in full compliance with all NEPA and MPRSA requirements. NOAA will consult with the USCG and the IMO to determine appropriate vessel traffic regulations after designation to ensure that Sanctuary resources and qualities are protected.

Vessel Traffic Monitoring

NOAA agrees that a vessel traffic monitoring and communications system along the California coast is desirable and appropriate for the region. Pursuant to SB 2040, the State of California is in discussions with

Vessel Traffic

Comment

NOAA Response

the Coast Guard regarding Vessel Traffic Service Systems (a vessel monitoring system) along the California Coast. An agreement may be reached by the end of 1993. The Oil Pollution Act 1990 requires the Secretary of Transportation to complete a comprehensive study on the impact of installation, expansion, or improvement of vessel traffic servicing systems, including the effectiveness of tanker-free zones. NOAA will work with the State, the USCG and appropriate public agencies during the development of these monitoring studies to determine an appropriate system for the Sanctuary.

Issue 4: Oil Spill Contingency Response Plan

Comment

Oil Spill Prevention

An adequate oil spill response plan should be created, emphasizing prevention first and containment second. The DEIS/MP overemphasized containment relative to prevention, and failed to address the potential impacts of large spills in and around the proposed Sanctuary area.

NOAA data base information should be used to identify potential oil spill sources, therefore helping to prevent spill events.

Oil Spill Contingency Plan

If spills can not be prevented entirely, a contingency plan should exist for emergency response and cleanup. To facilitate response action, NOAA should work with, and build upon, the efforts of other organizations and agencies already developing plans for the area.

There is a lack of emergency equipment and there may be inadequate response capabilities in the Sanctuary region. It is important to develop a Sanctuary contingency plan which recognizes the need for ongoing spill response training and for appropriate emergency equipment and response plans.

An oil spill response facility should be constructed on the California coast, and a full emergency response team, including an ocean-going tug boat, should be centered in Monterey.

NOAA Response

Oil Spill Prevention

NOAA has taken preventative measures to address these threats by: 1) proposing a prohibition of oil and gas development within the Sanctuary boundary; and 2) exploring ways to minimize the release of oil from vessels by working to reduce vessel traffic within the Sanctuary (see NOAA's *Vessel Traffic* response).

NOAA is currently preparing an inventory of past oil spills in and around the Sanctuary area, and will use this data to identify potential spill sources and to focus management efforts accordingly.

Oil Spill Contingency Plan

The FEIS identifies existing oil spill contingency plans and efforts in the Monterey Bay area. However, NOAA agrees that the Monterey Bay National Marine Sanctuary requires its own contingency plan to ensure that resources are protected during events that threaten the environment. A prototype Sanctuary Contingency Plan is almost complete, and will be tested at the Channel Islands National Marine Sanctuary. Once implementation experience has been gained, the plan will be adapted to other Sanctuary sites, including Monterey Bay. To successfully implement an organized approach to emergency response, NOAA will incorporate State and Federal legislation, as well as local efforts, into the Sanctuary Contingency Plan.

NOAA agrees that with Sanctuary designation, the area will warrant the equipment necessary to handle large-scale emergency response situations. NOAA is, therefore, exploring the feasibility of purchasing such equipment as well as coordinating with OCS industry and local oil spill response facilities. The USCG will be responsible for developing regional spill response training programs using emergency response equipment. NOAA will conduct periodic drills within the Monterey Bay Sanctuary to test local emergency response capabilities.

The development of an oil spill response facility and an emergency response team located on the California central coast will be the responsibility of the State of California and the USCG. If such a team is developed, and a facility built, NOAA will participate fully to ensure Sanctuary resources are protected.

Comment

SB 2040, a bill recently approved by the California State Legislature, will provide additional funds for emergency stations and radar equipment to monitor vessel traffic. NOAA should work with State and local radar facilities to track potential problem vessels.

Cleanup Activities

Agreements should be established between various local, regional, State, and Federal agencies to ensure adequate cleanup response.

Moss Landing Terminal

An organization such as *Clean Seas* should provide supervisory personnel when a tanker is mooring at Pacific Gas & Electric's (PG&E) Moss Landing Terminal. PG&E should be responsible for clean-up if any accidental spills occur as a result of operations at the Moss Landing Power Plant.

Oil Spill Penalties

Penalties should be imposed on those responsible for catastrophic accidents.

Penalties should be imposed on those responsible for catastrophic accidents.

NOAA Response

California's SB 2040 authorizes local governments to develop regional oil spill response plans, and provides funds for a wildlife rehabilitation facility, emergency stations, and radar equipment to monitor offshore vessel traffic. NOAA will coordinate with California to work with State and local radar facilities to improve vessel tracking.

Cleanup Activities

Under the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 CFR Part 300, the USCG serves as the Federal on-scene coordinator to organize all containment, removal and disposal efforts, and resources during a spill event. If a spill occurs, NOAA will take an active role, to the extent allowable, to participate, coordinate, and actively protect natural resources. During the planning phase, NOAA will work with the existing response mechanism, and will cooperate with local government, industry, organizations, and interested individuals to implement a comprehensive contingency plan. A top priority for the Sanctuary Manager will be to meet with those involved with contingency planning to coordinate Sanctuary roles and responsibilities during an emergency response situation.

Moss Landing Terminal

NOAA will pursue the viability of recommending that a clean-up organization provide supervisory personnel when tankers moor at PG&E's Moss Landing Terminal. Currently, PG&E is responsible for the clean-up of spills at the Moss Landing Power Plant.

Oil Spill Penalties

Under the Marine Protection, Research, and Sanctuaries Act (MPRSA), section 307, any person subject to the jurisdiction of the United States who violates any Sanctuary regulation shall be liable for a civil penalty of not more than \$50,000 per day. Section 312 of the MPRSA states that all recovered amounts can be used to restore, replace, and manage Sanctuary resources.

California's SB 2040, Article 9, allows the State to collect \$5,000-\$500,000 in penalties for violation of the Act. Collected fines will be deposited into the Environmental Enhancement Fund to be used for enhanced projects adjacent to marine waters, not for

Comment

NOAA Response

cleanup of oil or restoration. The 1990 Oil Pollution Act (OPA) creates new liability limits for vessels, offshore, and onshore facilities, ranging from \$600 per gross ton to \$350 million per facility. Penalties go to the Oil Spill Liability Trust Fund and can be used for removal costs, damages for injury to natural resources, and public services.

Wildlife Considerations

A sea otter enhancement or study facility should be created within the Sanctuary area. This facility could be converted into a rehabilitation station if necessary following a spill. NOAA should cooperate where appropriate.

Wildlife Considerations

Under California's SB 2040, funds will be available for a wildlife rehabilitation facility which will be the responsibility of the State of California. NOAA will cooperate as appropriate.

Issue 5: Depositing and Discharging Activities

Introduction

All discharges classified under the Clean Water Act (CWA) as "discharges into the waters of the Nation" are under the scope of Sanctuary designation 15 CFR 944.5 (a) (2)-(3).

NOAA will work within the existing process, rather than create a new regulatory review and approval procedure, governing discharge activities in the Monterey Bay National Marine Sanctuary area and coastal watersheds that currently require (or will require) a National Pollutant Discharge Elimination System (NPDES) permit or a Wastewater Discharge Requirement (WDR) permit for discharges that affect, or may affect, the Monterey Bay NMS. Generally, these permits are issued for municipal, power, and industrial plants, and for the use of ocean disposal sites.

Consistent with the MPRSA primary objective of protecting the Sanctuary and its resources, section 301 (b) (5) of the MPRSA, 16 U.S.C. § 1431 (b) (5), the Sanctuary regulations address discharges within the Sanctuary boundary (15 CFR 944.5 (a) (2)) as well as those discharges outside the Sanctuary boundaries which may enter the Sanctuary and injure resources and qualities (15 CFR 944.5 (a) (3)).

In accordance with section 304 (c) (1) of the MPRSA, 16 U.S.C. § 1434 (c) (1), NOAA may regulate existing permits through certification which may include the imposition of terms and conditions consistent with the purposes for which the Sanctuary is designated. Regulation of new discharge permits issued after the date of designation will be subject to a review process which may include added terms and conditions or objection to issuance, as necessary to protect Sanctuary resources and qualities. Any application for an amendment, renewal, or extension to an existing discharge permit will be considered a new discharge permit.

No new discharge will be permitted into the Sanctuary, unless the discharger can prove that it will be beneficial to Sanctuary resources and qualities. For municipal discharges, the Sanctuary will require at least secondary treatment, as appropriate, depending on the risk to Sanctuary resources and qualities. All new ocean disposal of dredge material will be

prohibited. Disposal at existing sites, at current frequencies, magnitudes and qualities will be regulated by the Sanctuary to ensure that the activity is consistent with the goals of the Sanctuary.

Other types of discharge activities, such as nonpoint source pollution, vessel discharges, toxic sites, and river outflow which are subject to Monterey Bay NMS regulations but currently do not require a permit, license, or other authorization, will be monitored by the Sanctuary to ensure resources and qualities are protected.

Comment

General State and Federal Regulatory Control

Depositing or discharging from any location within the boundaries of the Sanctuary or from beyond the boundaries of the Sanctuary should be prohibited. The regulation of discharges to improve effluent quality is a significant concern.

California's possible loss of control over specific activities in State waters is a concern. NOAA's discharge regulation and permit activities should be limited to Federal waters, and such actions should be coordinated through the appropriate agencies and cooperative agreements.

The regulatory working agreements that exist now, specifically between the Environmental Protection Agency (EPA) State Water Resources Board and the California Regional Water Quality Control Board (CRWQCB) should be formally agreed upon before the management plan is adopted to assure cooperation.

The DEIS is not sufficient for the Governor of California to take action. NOAA should address the conflict existing between California policy and Sanctuary designation. A joint EIS/EIR must be prepared according to the California Environmental Quality Act (CEQA). This joint plan should respect the laws of the State of California, not supercede them.

Some city governments do not favor NOAA regulation, and suggest instead that NOAA act in an "oversight capacity" to ensure that State and regional boards comply with regional discharge standards, and address the quality of discharge instead of the process. Because NOAA is inexperienced in Califor-

NOAA Response

General State and Federal Regulatory Control

NOAA agrees, and will regulate depositing or discharging from any location within the boundaries of the Sanctuary and from beyond the boundaries of the Sanctuary, that subsequently enter the Sanctuary and injure resources or qualities. NOAA will work with agencies and dischargers to certify discharge permits. NOAA may require special terms and conditions, including (but not limited to) improved effluent quality to ensure Sanctuary resources and qualities are protected.

Approximately 16 percent of the Monterey Bay Sanctuary ecosystem lies within State waters. These resources and qualities (including, but not limited to, coastal wetlands and estuaries) are the most vulnerable to dischargers and degraded water quality. To ensure Sanctuary resources and qualities are protected uniformly in this area, NOAA requires the authority to regulate discharges if it is determined that Sanctuary resources and qualities may be injured. Sanctuary staff will work closely with agencies through Memorandums of Agreement (MOAs) between Federal, State, and local water quality management agencies to determine specific procedures to achieve the goals of the Sanctuary using the existing discharge permitting process.

It is NOAA's intent to reach a formal agreement prior to the completion of the management plan prior to designation. NOAA and existing water quality management agencies are in the process of developing an MOA to determine an appropriate regulatory framework between all agencies to ensure Sanctuary resources and qualities are protected.

NOAA has enjoyed a close working relationship with the State of California throughout the entire designation process. It is not the intent to supercede California laws, but rather to enhance State and Federal natural resource protection programs. However, because NOAA is the sole Federal agency responsible for designating the Sanctuary, only NEPA applies.

NOAA will be acting in an oversight capacity within the existing regulatory framework. NOAA requires the authority to act within this framework to ensure Sanctuary resources and qualities are protected.

Comment

nia water control issues, it should defer to strict State regulations.

NOAA should include California's Ocean Plan and the Central Coast Regional Basin Plan standards in the Sanctuary regulations.

NOAA's assumption of regulatory authority is a concern. To maintain an equitable regulatory regime, old and new dischargers should have the same benefits and restrictions.

All cities should be required to obtain the appropriate permit from NOAA, and NOAA should control and reduce discharges to improve effluent quality.

NOAA should clearly define regulations and procedures prior to assuming responsibility, and should clarify its position by either defining requirements for all dischargers in the FEIS/MP or by setting conditional discharge requirements during the planning phase.

NPDES Permits

NOAA's certification of the NPDES permits should parallel that of the Central Coast Regional Water Quality Control Board and EPA's permitting process, rather than await the completion of the State-EPA permit process.

Sanctuary regulations should be modified to exempt discharges regulated by the NPDES and to allow discharges under the existing RWQCB standards.

The FEIS should discuss how NOAA plans to view NPDES permit renewals. Will new permits be required, or will old permits be recertified?

NOAA Response

The existing plans and standards will provide a starting point from which NOAA will evaluate how effectively: 1) dischargers meet the terms of the plan; and 2) the standards and guidelines protecting Sanctuary resources and qualities. In addition, NOAA does not intend to eliminate any existing State or Federal authority, but rather to build upon the existing regulatory framework to provide the level of protection necessary for the nationally significant resources and qualities of Monterey Bay. However, inclusion of both plans is inappropriate.

The MPRSA gives NOAA different authorities regarding old versus new permits. NOAA can prohibit the exercise of new permit applications, but not existing permits.

NOAA agrees. However, NOAA does not intend to create a new permit process or permit, but to work with the existing process to reduce delays and prevent unnecessary paperwork.

Existing authorities set up standards, criteria, and discharge requirements. NOAA will work with these authorities within the existing regulatory process to determine if the standards and criteria are sufficient to protect Sanctuary resources and qualities, and that these standards and criteria are met.

NPDES Permits

NOAA agrees, and will work in parallel with relevant authorities. The exact procedures will be determined, wherever possible, upon completion of the necessary MOAs.

NOAA disagrees. To ensure that a level of protection is given to the resources of the Monterey Bay area, consonant with the area's national significance, NOAA intends to regulate all dischargers and depositors including those with NPDES permits.

NPDES permit renewals will be treated as new permit applications.

Comment

New wastewater discharges into Sanctuary receiving waters with treatment levels less than secondary treatment should be prohibited.

The regulation prohibiting depositing or discharging of potentially harmful materials is sufficient to exclude the possibility of such pollution, and enforcement is unnecessary.

Increased Costs of Improved Treatment

Concern was expressed over the DEIS statement that secondary treatment is a minimum requirement, and that a higher level of treatment is preferred. It was suggested that this "preference" could later become the minimum level, and this would substantially impact the construction and operational costs of treatment facilities because they would not be required to upgrade from their current secondary treatment level. Specifically, NOAA should address: 1) the unavoidable adverse impacts of increased energy and chemical use required for higher treatment levels; 2) potential results of dischargers forced to use land disposal schemes rather than ocean outfall schemes; 3) the possibility of higher water and sewer bills resulting from improved treatment levels; and 4) the impacts of municipal dischargers and the limited number of alternatives available to such dischargers.

The environment is equally affected by similar sewage discharges from various sources. Therefore, regulations should be clarified concerning the potential for some cities to discharge into Monterey Bay while others can not.

Comments on the DEIS

Discharge permits should be conditioned, and the FEIS should clearly state that the burden of proof will be on the discharger to show that resources will not be damaged before a permit or certification is given.

A mechanism should be included in the management plan to channel public input into the permitting and certification process.

301H waivers should be discussed in the FEIS and prohibited within the Sanctuary.

NOAA Response

NOAA intends to require at least secondary standards, as appropriate, depending on the threat to Sanctuary resources and qualities.

Discharges that prove harmful and injurious to the Sanctuary will be prohibited.

Increased Costs of Improved Treatment

NOAA intends to require at least secondary treatment standards, as necessary, depending on the threat to Sanctuary resources and qualities. Dischargers will be reviewed on the basis of providing protection to Sanctuary resources. By working within the existing process, increased operational and construction costs, as well as alternative disposal costs, will be taken into account.

NOAA's review and approval of discharge permits will be based on the effect of the discharge on the Monterey Bay Marine Sanctuary, regardless of its source.

Comments on the DEIS

NOAA intends to certify and condition discharge permits based on information provided by the discharger. The burden of proof will be on the discharger to prove that Sanctuary resources and qualities will not be injured by the discharge.

The existing permit process provides numerous opportunities for public input.

301H waivers permit discharge of primary treated sewage effluent into receiving waters. This is inconsistent with NOAA's policy to require secondary

Comment

NOAA Response

information on point discharges from shore should be included in the FEIS to complement the information in the DEIS on length-of-shore outfall.

and possibly tertiary treatment, as appropriate, depending on environmental impacts.

This information has been added to the FEIS.

Fishing and Vessel Operation Discharges

Fishing and Vessel Operation Discharges

NOAA should clarify the types of discharges allowed during routine fishing and vessel operations. Discharge and depositing exemptions should be reconsidered for fishing and vessel operations because of the harm caused by marine debris.

Discharges and deposits from fishing vessels may be regulated except for specific discharges intended to provide for normal fishing activities, such as cooling waters from boat engines, and fish wastes.

During routine fishing operations, raw sewage disposal and oily bilge water is common, and such discharges should be more strictly regulated.

Bilge pumping and raw sewage disposal are prohibited in the Sanctuary.

Land-based Dischargers

Land-based Dischargers

If NOAA is concerned with inland dischargers, such dischargers should be listed and described in the FEIS.

Inland discharge information is provided in the FEIS for dischargers in watersheds adjacent to the Sanctuary.

NOAA has neither the staffing nor the experience to regulate land-based nonpoint dischargers. NOAA should use existing nonpoint source programs by working with State and regional water quality control boards.

NOAA intends to work with existing water quality control boards including those governing nonpoint source pollution. Recent amendments to the Coastal Zone Management Act (CZMA) provide NOAA, EPA, and Coastal Zone Management programs an opportunity to control nonpoint source pollution.

Section 104 of the MPRSA has been interpreted to indicate that a point source discharger with a permit authorized under the provisions of the Clean Water Act is licensed to discharge certain pollutants into marine waters. If such pollutants result in damage to Sanctuary resources, the discharger would not be liable under Section 104, if in full compliance with applicable permit requirements.

Section 104 of the MPRSA concerns ocean dredge waste disposal, not NPDES permitted point source pollution. Ocean dredge waste disposal is prohibited in the Sanctuary, except at existing designated sites SF-12 and SF-14 off Moss Landing, at existing frequencies and magnitudes. Deposits of dredge waste at SF-12 and SF-14 will be reviewed and certified in accordance with §CFR 944.9.

The FEIS should include information on nonpoint source pollution. This information was not included in the DEIS.

This information is included in the FEIS.

Water Quality Issues

Water Quality Issues

The proposed Sanctuary staff should include a water quality specialist if Sanctuary water quality criteria are to be altered from existing State requirements.

NOAA agrees. A water quality specialist will be hired within one year after designation.

Comment

The Marine Sanctuary Administration and the RWQCB should prepare a timetable for preparing and implementing any new water quality criteria. Goals and objectives relating to water quality criteria should be quantifiable and measurable to aid in enforcement.

NOAA has not discussed what, if any, evidence of water quality degradation is necessary in order for additional conditions to be placed on existing permits. NOAA should develop a list of criteria to be used to judge the adequacy of existing permit conditions.

Air Quality Issues

The DEIS did not address air quality issues but should have. One of the greatest threats to the Sanctuary is water- and air-borne pollution from oil operations and other regional development.

Desalination Regulation

The DEIS does not adequately address desalination plant regulation.

Desalination may become an important source of fresh water for California. NOAA should analyze the impacts of proposed regulation on future desalination facilities discharging into Sanctuary receiving waters.

Proposed desalination discharges should be examined by the Sanctuary regulatory regime on an individual, as well as cumulative, basis.

NOAA Response

The Sanctuary will work with the RWQCB within its existing timetable and with all other authorities to determine appropriate terms and conditions during the certification process on each discharge. NOAA agrees that goals and objectives should be quantifiable.

Evidence of water degradation is provided in the FEIS. In addition, the loss of wetlands and shellfish closures due to degraded water quality require an extra level of protection that the Sanctuary can provide upon designation.

Air Quality Issues

No oil and gas activities will be allowed within the Sanctuary boundary. NOAA will work with the California Air Resources Board (CARB) and MMS to determine the level of impacts, if any, of OCS activities and regional development on the resources and qualities of the Sanctuary area.

Desalination Regulation

NOAA has incorporated a discussion of desalination activities into the FEIS. This section includes potential impacts on the marine environment and environmental consequences of a desalination facility in the region.

NOAA agrees that desalination may become an important fresh water source for California. Currently, the construction and operation of two desalination plants has been proposed for the Sanctuary area, one in Marin County and the other in Monterey County. Existing authorities set up standards, criteria and discharge requirements. NOAA will work with these authorities, within the existing regulatory process, to determine if the standards and criteria are sufficient to protect Sanctuary resources and qualities.

While NOAA recognizes that desalination technologies have the potential to address recent water shortages in the Monterey Bay area, NOAA is concerned with the potential negative effects of these activities individually and cumulatively on the Monterey Bay ecosystem. NOAA has included desalination activities under the scope of Sanctuary regulatory authority. Proposed desalination activities

Comment

Seawater brine discharge created through a desalination process, as well as the installation, construction, and maintenance of the disposal lines, should be under the auspices of a local public agency and allowed in the Sanctuary.

Environmental Concerns

Desalination is an expensive and energy-intensive way of securing fresh water. In addition, the highly saline outflow from these plants is harmful to the marine environment.

Discharges from outside the Sanctuary should be prohibited, including sewage outfalls and contaminated waste because, in the future, affected waters may be used for domestic water supply, and such discharge is not currently allowed in other similarly situated areas.

NOAA Response

could be affected by the Sanctuary regulatory regime governing discharges, alteration of the seabed, and the taking of marine mammals and seabirds.

NOAA will be acting in an oversight capacity within the existing regulatory framework. NOAA intends, however, to work with desalination plant owners and operators as well as the relevant management authorities through the Sanctuary's proposed certification procedure provided in 15 CFR 944.10.

Environmental Concerns

NOAA will review specific desalination proposals and analyze information from existing desalination plants in conjunction with relevant authorities including the California Coastal Commission, Monterey Regional Water Pollution Control Agency, Regional Water Quality Control Board, and coastal cities. This review will determine whether operation of desalination plants is consistent with the objectives for which the Sanctuary is being designated. NOAA's review will include, but will not be limited to: 1) pipeline construction on the seabed; 2) degradation of water quality from chemicals in the discharge water; and 3) the disposal of heated and concentrated brines and their potential impacts on the resources and qualities of the Sanctuary.

NOAA agrees that by allowing discharges from industrial and municipal sources into coastal waters, water contamination may occur. NOAA may require special terms and conditions including, but not limited to, improved effluent quality to ensure Sanctuary resources and qualities are protected.

Issue 6: Alteration of, or Construction on the Seabed

Comment

Regulatory Authority

Proposed regulation 15 CFR 944.5 (a) (5) should be modified so as to not pre-empt the existing authority of CDF&G to allow seabed alteration if necessary for the development of maritime operations.

Geophysical Surveys

Geophysical survey activities should be prohibited or strictly regulated due to the short- and long-term effects of deep seismic surveys on marine biota.

Dredging

Dredging is essential to maintaining viable working harbors. However, because of potential degradation to the environment, dredging should be prohibited within the Sanctuary. NOAA should clearly state how regulations will affect current dredging activities in the Sanctuary.

NOAA regulations should be avoided due to the additional cost to the local taxpayer.

NOAA Response

Regulatory Authority

NOAA's regulation of prohibiting alteration of, or construction on the seabed exempts specific activities, including certain maritime operations determined to be compatible with the purposes of the Sanctuary, from the scope of the regulation. In addition, existing activities that have a valid lease, permit, licence, approval, or other authorization issued by any Federal, State, or local authority prior to the designation of the Sanctuary will be reviewed by the Sanctuary in accordance with 15 CFR 944.9 and allowed if consistent with the purposes of the Sanctuary.

New activities would be regulated by the Sanctuary in accordance with 15 CFR 944.10, which states that any person applying for a lease, permit, licence, approval or other authorization from any Federal, State, or local authority to conduct a prohibited activity in the Sanctuary must notify NOAA. NOAA then has the authority to review, certify, or deny the activity.

Geophysical Surveys

NOAA encourages research within the Sanctuary. If the research violates a Sanctuary regulation (such as alteration of, or construction on the seabed) researchers are required to obtain a sanctuary research permit (15 CFR 944.8). NOAA will determine the environmental consequences of the proposed research, including short- and long-term effects on marine biota, and may deny the request if environmental consequences are determined to be too severe.

Dredging

Existing permitted dredging activities such as routine harbor maintenance and dredging of navigation channels at current magnitudes and rates will be exempt from Sanctuary regulations.

NOAA has determined that the overall socioeconomic impact of the Sanctuary will be positive due to the enhanced resource protection regime for this valuable environment (See FEIS, Part IV Section IV).

Comment

Contrary to the DEIS, agencies *regulating and reviewing* the dredging process have done a thorough job, and an additional step in the permit process would be unnecessary, cumbersome, and expensive.

Sand and mud dredging is necessary to maintain operations at the PG&E plant.

Ocean Dumping

Ocean dumping is a threat to the marine environment and should be entirely prohibited within the Sanctuary area.

NOAA should address the potential conflicts between Boundary Alternatives 4 and 5, and the current EPA efforts to designate a permanent ocean disposal site off the coast of San Francisco.

Any additional layers in the permit process would be unnecessary, cumbersome, and expensive.

The DEIS does not specify whether Federally authorized dredge material disposal sites SF-12 and SF-14 will remain available for future dredging projects that would otherwise qualify for State and Federal permits.

Sandmining

Sandmining is detrimental to the environment, especially drag line and hydraulic slurry sandmining, and this type of extraction should be prohibited. However, existing sandminers should be grandfathered to allow continued extraction activities in the Sanctuary.

NOAA Response

NOAA recognizes the roles of the agencies presently regulating and reviewing the dredging process. However, unlike NOAA, these agencies are not mandated to review activities from an ecosystem perspective. The goal assigned the highest priority for Sanctuary management is to protect the marine environment, resources, and qualities of the MBNMS. NOAA will work with the current regulatory agencies to assure that mutual goals are satisfied. In addition, NOAA intends to work within the existing process to reduce unnecessary steps in the permit process.

Existing routine harbor maintenance and dredging activities at current magnitudes and rates will be allowed to continue at the PG&E plant.

Ocean Dumping

No dumping of dredge material will be allowed within the Sanctuary except at current frequencies and magnitudes at existing designated sites SF-12 and SF-14. Existing dumping and disposal of dredge material will be regulated by the Sanctuary in accordance with 15 CFR 944.9.

NOAA prefers Boundary Alternative 2, which does not overlap with any EPA study sites. However, NOAA will continue to work with the EPA, the COE and the city of San Francisco and Oakland to ensure that the determination of a final disposal site will not threaten either the Monterey Bay National Marine Sanctuary nor the Gulf of the Farallones National Marine Sanctuary.

NOAA agrees, and intends to work within the existing process regarding disposal at existing sites SF-12 and SF-14.

SF-12 and SF-14 will remain available for ocean disposal at existing frequencies and magnitudes.

Sandmining

Sandmining below the mean high tide line in the surf zone is prohibited. Existing activities below the mean high tide line can continue until expiration of current permits. Sandmining in the surf zone using drag line and slurry techniques alters the seabed and is detrimental to nearshore habitats and biota in the

Comment

However, existing sandminers should be grandfathered to allow continued extraction activities in the Sanctuary.

Artificial Reefs

Artificial reefs should be allowed through a permitting process devised by NOAA, not at the discretion of the Sanctuary Manager.

NOAA Response

drag line and slurry techniques alters the seabed and is detrimental to nearshore habitats and biota in the MBNMS. It is also known to accelerate natural erosion of the adjacent dune system.

Artificial Reefs

NOAA is not aware of any existing artificial reefs in the Sanctuary. The creation of new artificial reefs would involve alteration of the seabed, and permits required by existing authorities would be reviewed and either certified, modified, or denied by NOAA and the Sanctuary Manager in accordance with 15 CFR 944.9. The Manager would provide recommendations to NOAA for the appropriate level of regulation.

Issue 7: Kelp Harvesting and Aquaculture

Comment

Operation and Regulation

The regulatory regime for aquaculture and kelp harvesting activities within the Sanctuary remains unclear. Currently, aquaculture development is the responsibility of the CDF&G, and because of this, mariculture operations requiring seabed alterations should be excluded from Sanctuary regulations, and allowed to continue.

There are a number of aquaculture facilities operating within the Sanctuary, yet the DEIS gives little consideration to their future operations. Why are only aquaculture facilities existing at the time of designation excluded from prohibitions concerning seabed alterations?

Is kelp harvesting included in the discussions on commercial fishing and mariculture operations?

The ecological effects of mechanical kelp harvesting techniques were not explained in the DEIS. Research should be conducted to examine the ecological effects of kelp harvesting and the impacts of non-point pollution on kelp beds.

NOAA Response

Operation and Regulation

Kelp harvesting is not regulated by the Sanctuary. The CDF&G is responsible for managing kelp harvesting and mariculture operations. Only new mariculture sites will be regulated by the Sanctuary in accordance with 15 CFR 944.10.

Existing mariculture facilities, at current levels of operation, do not appear to pose a threat to Sanctuary resources and qualities. However, if new sites are proposed, or existing sites request a change in the level of operation, the Sanctuary needs to ensure that the change will not injure Sanctuary resources and qualities.

Kelp harvesting is included in the discussion of fishing regulation, licences, and permits. No kelp harvesting regulations are proposed with designation.

NOAA has included a discussion of kelp harvesting in the FEIS. Consultation with the CDF&G indicates that little research has been conducted as to the ecological effects of mechanical kelp harvesting techniques on kelp beds. Yearly harvests of perennial giant kelp do not deplete the resource and the effects, if any, of nonpoint pollution remain unclear. NOAA may consider focusing research efforts on the study of kelp ecology and impacts on its distribution and abundance in the Sanctuary.

Issue 8: Harbor Exclusion**Comment****NOAA Response****Issue Clarification**

Harbor exclusion from Sanctuary boundaries is supported, but should be discussed more completely in the FEIS.

Issue Clarification

The FEIS includes a specific section on harbors. As stated in the DEIS, harbors are excluded from the Sanctuary boundaries and these areas are clarified in the FEIS. In the case of Moss Landing Harbor, the Sanctuary will have overlapping jurisdiction with the Moss Landing Harbor District in Elkhorn Slough, east of the Highway 1 bridge.

Harbor Redefinition

Exemptions exist for routine anchoring, fishing, navigation, and harbor maintenance. Why are harbors excluded and not exempt?

Harbor Redefinition

NOAA chose to exclude harbors from the Sanctuary boundaries because of their special use requirements. By excluding harbors, as opposed to creating a long list of exemptions from regulations, NOAA intends to provide a simpler regulatory regime.

One harbor in the study area has jurisdiction extending past the jetty system and encompassing the Federal navigation channel. The harbor exclusion area should be redefined to allow internal harbor management and entrance responsibilities, including dredging.

Routine harbor maintenance activities that are outside of the harbor exclusion area as defined in the FEIS but within the Sanctuary are exempted from the specific regulation impacting their use. For example, dredging of navigation channels at existing rates and magnitudes, the placement of navigation aids, and construction of docks and piers are all allowed within the Sanctuary.

Issue 9: Linkages with Elkhorn Slough

Comment

Sanctuary Linkage

The Sanctuary should include all waters in the Elkhorn Slough National Estuarine Research Reserve (ESNERR), and this relationship should be formalized. It is important to create a link between the Monterey Bay Sanctuary and the Reserve, even if this means exempting Moss Landing Harbor. A MOA should be developed between NOAA and the Moss Landing Harbor District to assure the success of the two programs.

The management plans and objectives of the Sanctuary and the Elkhorn Slough Reserve should be coordinated.

NOAA Response

Sanctuary Linkage

NOAA agrees it is important to coordinate closely with the ESNERR to ensure the success of both programs. The Sanctuary includes all waters in the Slough up to the Reserve boundaries. NOAA agrees that links should be fostered since missions and goals are similar. The mission of the Sanctuary Program is to identify, designate and manage areas of the marine environment of special national significance due to their conservation, recreational ecological, historical, research, educational, or esthetic qualities. The mission of the National Estuarine Reserve Research System is to establish and manage, through Federal-State cooperation, a national system of estuarine research reserves representative of the various regions and estuarine types in the United States.

Regardless of their similarities, the two programs must remain administratively separate because: 1) the management of National Marine Sanctuaries are under Federal jurisdiction and the NERR's system, while dependent upon pre-existing State protection of the specific sites, is a Federal/State partnership; 2) funding is appropriated under two different Acts; and 3) ESNERR was designated under the Coastal Zone Management Act whose regulations prohibit the overlap of boundaries between Sanctuaries and Reserves.

After consultation with the Moss Landing Harbor District, NOAA has determined the most appropriate method of linking the two sites is to exclude Moss Landing Harbor east of the Colregs line and west of the Highway 1 bridge, and to include the waters of Elkhorn Slough east of the Highway 1 bridge to the boundary of the ESNERR with overlapping jurisdiction over the Moss Landing Harbor District.

NOAA agrees that there should be coordination between Elkhorn Slough and the Sanctuary. NOAA supports the exchange of information, research, education, and staff expertise between the two programs. Meeting the objectives of both programs as well as implementing the management plans can be coordinated through the Sanctuary Advisory Committee, and the ESNERR Advisory Committee, and NOAA encourages Sanctuary and Reserve staff to actively participate in this process.

Issue 10: Nearshore Development

Comment

Protection of Coastal Lands from Development

There is a need for landward protection and controls on nearshore development. Adequate protection of the ocean environment must include management of the adjacent coastal and upland zones. NOAA should extend its jurisdiction to include beaches, dunes, uplands, and wetland habitats adjacent to the proposed Sanctuary.

The impacts of increasing local transportation traffic adjacent to the Sanctuary should be addressed in the FEIS.

No excavation, drilling, pile driving, trenching, or soil aeration should be allowed on lands suspected to contain hazardous chemicals, as such activities might result in point or nonpoint source discharges to the Sanctuary.

Seawall Impacts

NOAA should prohibit the construction of seawalls after Sanctuary designation. It is well-documented that seawalls change wave refraction patterns, often increasing erosion on adjacent sites, and property owners should not be allowed to build these structures.

Beach Nourishment

Are there any limits on the amount of silt in the sand used for beach nourishment? Even though the sand may be placed above the high tide mark, erosion may move silt into the Bay.

NOAA Response

Protection of Coastal Lands from Development

NOAA agrees that protection and management of the land portion of the coastal zone is necessary for adequate protection of the ocean environment. NOAA will coordinate with existing coastal zone management authorities such as the California Coastal Commission and the State Lands Commission regarding potential land and waterbased threats and impacts to the Sanctuary under the MPRSA. The physical boundaries of a National Marine Sanctuary encompasses marine waters up to the mean high tide line. However, NOAA intends to protect the Sanctuary from coastal development via its extra territorial discharge regulation to ensure that coastal and Sanctuary resources are protected.

NOAA has included a discussion of urban and associated developmental impacts in the FEIS.

The EPA has programs dealing with hazardous material disposal and recovery. NOAA will work with Federal, State, and local authorities and landowners regarding appropriate measures for addressing hazardous chemical sites that may affect Sanctuary resources.

Seawall Impacts

Activities that require drilling through, dredging, or otherwise altering the seabed of the Sanctuary, or constructing, placing, or abandoning any structure or material on the seabed of the Sanctuary are prohibited. This includes seawalls.

Beach Nourishment

NOAA does not regulate beach nourishment programs. However, NOAA is concerned with the movement of materials into the Sanctuary, including particle size and composition of sand. NOAA will work with the appropriate authorities to determine the impacts of beach nourishment programs and whether these activities are consistent with the goals of the Sanctuary.

Issue 11: Historic Resource Protection

Comment**Resource Preservation**

Protection of historic and cultural resources within the Sanctuary is a significant concern. NOAA should prohibit moving, injuring, or possessing historic resources within the Sanctuary.

Shipwrecks

Sanctuary regulations should not apply to activities permitted by the State within state waters under the Shipwreck and Historic Maritime Resources Program.

NOAA Response**Resource Preservation**

NOAA agrees that it is necessary to protect and manage historic and cultural resources within the Sanctuary boundaries. NOAA has proposed a prohibition on moving, possessing, or injuring, or attempting to move, possess, or injure these resources.

Shipwrecks

The Abandoned Shipwreck Act of 1987 gives states the title to abandoned shipwrecks in State waters. Under the MPRSA, the Sanctuaries and Reserves Division has managerial responsibilities for abandoned shipwrecks within National Marine Sanctuaries, including those located in State waters, for the purpose of protecting their resources and qualities. NOAA will coordinate with State agencies to ensure that historic and cultural resources, as well as living marine resources, within the Sanctuary are protected.

Issue 12: Taking of Marine Mammals and Seabirds

Comment

Prohibition of Take

The prohibition on the taking of marine mammals and seabirds within the Sanctuary is redundant to the Endangered Species Act (ESA), the Marine Mammal Protection Act (MMPA), and the Migratory Bird Treaty Act (MBTA).

Incidental Take

Data has been presented for California State waters showing that over 6,500 California sea lions, harbor seals, sea otters, and harbor porpoises were killed in gill and trammel nets between 1986 and 1987, in addition to thousands of seabirds. Additional regulations and protective measures are needed for these species.

NOAA Response

Prohibition of Take

While marine mammals and seabirds are protected under these Acts, NOAA believes that the higher penalties afforded under the MPRSA will provide a stronger deterrent.

These Acts set maximum financial penalties ranging between \$2,000 and \$25,000 per violation. The MPRSA (under §307) allows NOAA to assess civil penalties as high as \$50,000 for each violation. The money collected is directed back into the Sanctuary Program. By directing the civil penalties into the Sanctuary Program, a more directed effort can be implemented to protect these valuable natural resources.

Incidental Take

The incidental taking of marine mammals and seabirds will be prohibited except in accordance with, and permitted by, regulations promulgated under the MMPA and the ESA. Exemptions under the MMPA include a limited five-year incidental take of marine mammals, which will be in effect until 1993. The ESA also has an incidental take exemption, §1539 (2) B (i). NOAA will adopt the existing regulations including their exemptions in the Sanctuary regulatory regime and will work with the relevant management authorities to determine whether these exemptions are adequate to protect the resources and qualities of the Sanctuary. In addition, numerous State laws have recently been enacted to provide further protection specific to seabirds and marine mammals (see comment and response below).

The Sanctuary intends to work with and enforce existing regulations rather than preempt existing regulations that protect natural resources. In some cases, NOAA is creating and implementing stronger regulations in order to protect the natural environment (ie. personal water craft regulations). A figure illustrating the geographic extent and existing state regulations has been added to the FEIS, as has a

Comment

Current Legislation

Three pieces of legislation are being proposed or amended that have the potential to impact marine mammals and birds within the Sanctuary:

1) California's proposed SB 2563 would prohibit the use of gill or trammel nets within 30 fathoms or less throughout the present sea otter range; 2) the reauthorization of the Marine Resources Protection Act (MRPA) that restricts gillnet fishing within three miles of the California Coast, and prohibits gill netting of rock fish and incidental take of marine mammals in central California; and 3) the amendments of the MMPA (1993) that may allow a continued number of incidental takes in California waters.

Coordination with U.S. Fish and Wildlife Service

The US F&WS is responsible for Southern sea otter management, and should be involved in making decisions which could effect this species.

Coordination with Environmental Groups

The DEIS ignores the fact that fishing and environmental organizations have successfully coordinated with fisheries management agencies to limit or eliminate harmful fishing methods in areas utilized by seabirds and mammals.

NOAA Response

discussion of the impacts of each regulation.

Current Legislation

NOAA will track these legislative issues and provide recommendations to increase protection of Sanctuary resources. NOAA intends to follow these issues and legislation, and when appropriate, modify policies to protect Sanctuary resources.

Coordination with U.S. Fish and Wildlife Service

NOAA will consult the USF&WS on Southern sea otter management and other issues affecting both agencies.

Coordination with Environmental Groups

NOAA agrees, and recognizes the fact that significant progress has been made between environmental groups and fishery management agencies regarding the protection of the marine environment. NOAA intends to assist where possible to enhance positive relationships.

Issue 13: Fishing Activities

Comment

Regulation and Prohibition

Fishing should not be prohibited within the Sanctuary area. Instead, fisheries resource regulation should remain under the jurisdiction of the State of California, the National Marine Fisheries Service, (NMFS) and the Pacific Fisheries Management Council (PFMC). This should be clarified in the FEIS.

Certain fish species in Monterey Bay should be regulated due to continuing declines.

Gill Net, Trammel Net, and Other Fishing Methods

Gill net fishing and the number of non-targeted species that perish in the gill net industry are a concern. Gill nets and trammel nets should be prohibited throughout the Sanctuary. Bottom dredge, trawl, and drag-net fishing methods should also be prohibited because of the damage to benthic natural resources.

NOAA Response

Regulation and Prohibition

Fishing will not be regulated in the Sanctuary, but it has been placed within the scope of regulations. Fisheries management will remain under the existing jurisdiction of the State of California, NMFS and PFMC. However, four proposed Sanctuary regulations could potentially indirectly affect fishing activities. Therefore, to be consistent with the intent to not regulate normal fishing activities upon designation, each regulation of concern specifically exempts normal fishing activities from the scope of these regulations to the extent consistent with existing State and Federal regulations. The four Sanctuary regulations that will affect fishing in Monterey Bay are: 1) Depositing and Discharging Activities; 2) Alteration of, or Construction on the Seabed; 3) Historic Resource Protection; and 4) Taking of Marine Mammals and Seabirds (See NOAA's *Sanctuary management response*.)

NOAA agrees that certain fish species in Monterey Bay may eventually need to be regulated. Fishing is included within the scope of regulations and, in the future, the Sanctuary will work with the fishermen and local management agencies as well as CDF&G, the PFMC, and the NMFS to determine whether any additional management measures that may be necessary to protect the resources and qualities of the Monterey Bay area. The PFMC would have the first opportunity to promulgate regulations affecting fishing activities.

Gill Net, Trammel Net, and Other Fishing Methods

The gill net fishery has been regulated since 1984 by the State and Federal governments because of the mortality of marine mammals and birds. Currently, gill netting is now restricted to waters deeper than 20 fathoms. In 1989, the halibut gill net fishing was closed inside 40 fathoms. Future regulations on this fishery are pending which would prevent gill net fishing from occurring within 30 fathoms. This would effectively move the current gill net inshore fishery beyond the zone of distribution of shore birds and coastal mammals.

The trawl fishery has also been extensively regulated and no trawlers are currently allowed within three miles of the coast. Unfortunately, there is almost no

Comment

NOAA Response

Shark Fishing

Commercial shark fishing should be strongly limited until enough research has been done to establish sustainable yields for specific species. Direct quotas should be established for shark species within the Sanctuary.

Shark Fishing

NOAA will work with fishermen and local management agencies as well as the CDF&G, NMFS, and the PFMC to determine if additional management measures are necessary to protect shark species. NMFS wrote and released a draft shark fishery management plan for public comment this year for the East Coast and Gulf of Mexico. If a shark management plan is developed for West Coast species, the Sanctuary Manager and NOAA will be involved in the formulation and evaluation, and will provide recommended courses of action. NOAA may consider focusing research funds on the study of shark ecology for those species that exist within the Sanctuary.

The practice of cutting off shark fins (finning) and discarding the carcasses should be banned within the Sanctuary. Recreational sport fishing for sharks should be severely limited, and selling shark catch should be prohibited.

All fishing activities in Federal waters are under the control of the PFMC. Fishermen in State waters are managed by the CF&G. NOAA will work with these agencies to determine if any shark plans or regulations are necessary to protect these species from this activity.

Comments on the DEIS and FEIS

The DEIS did not demonstrate that additional fishing regulations in the Sanctuary were necessary to protect fish populations.

Comments on the DEIS and FEIS

NOAA agrees that there is little evidence that current fisheries management initiatives are ineffective. Hence, NOAA is not proposing to regulate fishing activities at this time. However, NOAA is including fishing in the scope of regulation so that if data does become available, NOAA can provide the PFMC with appropriate recommendations for PFMC action, or take appropriate direct action.

What structures or materials on the seabed in connection with fishing will be allowed?

Constructing, placing, or abandoning any structure or material on the seabed of the Sanctuary will be prohibited, except when resulting from normal routine fishing operations such as use of traps and bottom trawls.

Issue 14: Motorized Aircraft

Comment**NOAA Response****Prohibition of Overflights****Prohibition of Overflights**

Motorized aircraft should be prohibited from flying over the Sanctuary.

Flying motorized aircraft within three nautical miles of mean high water within the Sanctuary and at less than 1,000 feet above the Sanctuary will be prohibited within four zones in the Sanctuary. Generally, these zones are from Pt. Santa Cruz north, Carmel Bay south (overlapping the California Sea Otter Game Refuge), and around Moss Landing and Elkhorn Slough (see FEIS for specific area zones).

Regulation of Overflights**Regulation of Overflights**

Federal Aviation Regulations (FARs) already adequately protect Sanctuary resources from aircraft impacts, making additional regulations unnecessary. New regulations may hinder cooperative emergency response plans, routine helicopter operations, and rescue attempts.

NOAA recognizes that overflights are regulated under the FARs. However, the penalties afforded under the MPRSA will provide an additional deterrent to the violation of existing regulations and will add a level of protection to sensitive Sanctuary resources and qualities. The MPRSA, under §307, allows NOAA to assess civil penalties of no more than \$50,000 for each violation. This regulation would not apply to overflights such as helicopter overflights and emergency responses below 1,000 feet, if necessary to: 1) respond to an emergency threatening, life, property or the environment; or 2) law enforcement and national defense activities. All other other overflights are prohibited within these zones.

Regulations should be modified to permit the CDF&G's Wildlife Protection Program to conduct low-level reconnaissance flights over the Sanctuary for the purpose of law enforcement and fish and marine mammal surveys. Prior consultation with Sanctuary staff should not be required. Any restrictions to this modification should be established through an MOA between the DF&G and the Sanctuary.

CDF&G overflights for enforcement purposes are exempt from the Sanctuary regulations according to 15 CFR 944.5 (a). CDF&G overflights for research purposes will require a Sanctuary permit in accordance with 15 CFR 944.8.

Seaplanes/Airport Approaches**Seaplanes/Airport Approaches**

Provisions should be developed governing the takeoff and landing activities of seaplanes within the Sanctuary and for designated airport approaches.

NOAA agrees. The zoned approach to the overflight regulations will facilitate seaplane and airport landings and takeoffs.

Issue 15: Personal Water Craft

Comment

Prohibition and Regulation

The danger water craft can pose to marine mammals and divers, and the noise and exhaust problems which may pose a threat to kelp beds and other biological resources in the Monterey Bay area, necessitate a prohibition or regulation of personal water craft. In addition, personal water craft should be prohibited in "areas of biological significance," including those with high human-use levels such as beaches; diving, swimming, and surfing areas; state parks; and preserves and reserves. Beside the potential danger to recreationists, personal water crafts disrupt low-intensity area uses.

Definition of Personal Water Craft

A more precise definition of personal water craft is needed.

Policy Timetable

NOAA should have a timetable outlining when the thrill craft policy will be evaluated and implemented.

Emergency Response Exceptions

Exceptions to the personal water craft policy should be made when the USCG response groups or individuals need to use fast small boat during emergencies.

State Consultation

The DEIS gives no role to the California Department of Boating and Waterways (CDBW), one of the most effective boating agencies in the nation. Consultation with this department is encouraged.

NOAA Response

Prohibition and Regulation

NOAA agrees. Regulations have been revised to restrict personal water craft throughout the Sanctuary (15 CFR 944.5 (8)), but to allow personal water craft to operate in specific zones. Generally, these areas are located off the harbors of Santa Cruz, Moss Landing, and Monterey and their selection was based on a number of criteria. Each was chosen to: 1) minimize conflict with other recreational users; 2) avoidance of kelp beds and sea otter populations; and 3) accessibility to launch areas and traditionally used regions.

Definition of Personal Water Craft

NOAA has defined personal water craft as any motorized vessel less than fifteen feet in length as manufactured, capable of exceeding a speed of fifteen knots per hour, and having the capacity to carry not more than the operator and one other person while in operation. The term includes, but is not limited to jet skis, wet bikes, surf jets, miniature speed boats, air boats, and hovercraft. Other vessels would not be affected by this regulation.

Policy Timetable

Regulations will go into effect approximately 30 days following completion of Congressional and Gubernatorial review and approval. NOAA will publish a public notice in the *Federal Register* stating the effective date of the regulations.

Emergency Response Exceptions

The prohibitions listed in the regulations at 15 CFR 944.5 (a) (2)-(8) do not apply to any activity necessary to respond to an emergency threatening life, property, or the environment.

State Consultation

The FEIS has been revised to include references to the CDBW. NOAA will continue to develop a close working relationship with all State agencies including the CDBW.

Issue 16: Sanctuary Management

Comment**Preferred Management Plan**

NOAA should choose management plan 2 which proposes that full-time staffing be implemented immediately after designation. The Sanctuary is significantly important, and the commitment of a full-time and immediate staff is necessary to initiate Sanctuary programs.

NOAA should choose management plan 1, which includes the gradual hiring of Sanctuary staff based on financial concerns. Because no issues were identified in the DEIS that would require immediate action, full staffing in the initial designation process is unnecessary.

Sanctuary headquarters should be located in Santa Cruz.

Financial Considerations

On-site staff should play a key role in identifying and procuring funds due to the modest Sanctuary budget.

NOAA Response**Preferred Management Plan**

NOAA's preferred management plan is a variation of alternative 2. This plan would establish the Sanctuary headquarters soon after designation and immediately provide full-time staffing of approximately five personnel to ensure that the Sanctuary program is implemented quickly and efficiently. Alternative 2 will build upon public support from the designation process and will increase opportunities for interpretation and research programs soon after designation. Additional staff and satellite facilities will be phased in after designation.

NOAA supports immediate Sanctuary staffing. The cumulative effects of increased tourism, business, commercial, and industrial uses of the area are intensifying. The Bay area currently receives municipal and industrial point source pollution as well as nonpoint pollution from pesticides and agricultural runoff. The Sanctuary program could play an important role in coordinating and implementing additional regulations designed to protect the area's natural resources. A full staff is required to provide the Sanctuary infrastructure necessary to address these and other issues.

Areas being considered for the Sanctuary headquarters include the cities of Monterey, Moss Landing, and Santa Cruz. On an interim basis, it has been proposed that the Sanctuary share existing NOAA facilities in Monterey. NOAA proposes to eventually establish a permanent headquarters facility in one of three cities with satellite offices around the Bay.

Financial Considerations

The MPRSA allows NOAA to develop cooperative agreements with non-profit organizations to seek donations and promote educational and scientific activities. The on-site staff will play a vital role in identifying and pursuing these relationships. Throughout the entire designation period, numerous individuals, agencies and organizations have provided guidance, data, and support.

Comment

The program budget and the Manager's salary level should be increased.

Regulation and Management

The Sanctuary Manager should have limited discretion over regulated activities, and key issues should be dealt with in the management plan.

The management plan should focus on regulatory enforcement. There are no established provisions, and there is uncertainty as to how regulations will be enforced once the management plan is implemented.

NOAA should work closely with existing marine research and education facilities to enhance resource protection, research, education, and enforcement programs.

To fill information needs, management operations should not receive a disproportionate share of the Sanctuary budget related to research and education.

NOAA Response

SRD's FY 92 budget has been increased from between \$4.746 and \$5.5 million. Some of these increased resources will be directed to the MBNMS. The Sanctuary manager position has been upgraded from a GS-12 to a GS-13 to reflect the complex responsibilities of the MBNMS.

Regulation and Management

The manager will have limited discretion on regulated activities based on the MPRSA and the Sanctuary regulations. The Sanctuary Manager reports directly to the Sanctuaries and Reserve Division (SRD). In this capacity, the Manager represents NOAA and is the primary spokesperson for the MBNMS. The management plan proposes actions tailored to specific issues affecting the Sanctuary, and will be revised to target specific issues based on the first three years of operation.

Although a detailed enforcement plan has not been developed, NOAA at present, envisions a State/Federal cooperative enforcement system involving the State of California, the USCG the USF&WS, the NMFS, and the EPA. Since the proposed Sanctuary would include both State and Federal waters, close coordination between State and Federal authorities would be required.

NOAA agrees. Implementation of the management plan will require cooperation and coordination among many Federal, State and local government agencies as well as private organizations and individuals. Information exchange, sharing facilities and staff, and the coordination of policies and procedures for resource protection will be features of all programs, including research, education, and enforcement.

NOAA develops a general budget, setting out expenditures for program development, operating costs, and staffing including enforcement, management, research and education. Funding priorities will be reviewed and adjusted annually to reflect evolving conditions in the proposed MBNMS, other sanctuaries, and National Marine Sanctuary Program priorities and requirements.

Comment

The FEIS should clearly state that the CDF&G will retain its authority to manage and regulate all uses of living marine resources within the Sanctuary. This authority should be independent of NOAA and the Sanctuary Manager.

The FEIS should include the roles of NOAA, the State of California, and the USCG following Sanctuary designation.

Sanctuary Advisory Committee: Participation

Numerous organizations and individuals, representing a wide range of interests (ie. teachers, biologists, environmentalists, industry representatives, natural resource managers, divers, commercial and sport fishermen, and surfriders) requested direct involvement with the Sanctuary Advisory Committee (SAC). All coastal cities within the sanctuary should be invited to participate in the advisory committee, and the Sanctuary Manager should act as liaison between the cities and the committee. The SAC should be set up like the Monterey Bay Sanctuary Steering Committee, which consists of a broad range of community leaders working with NOAA to develop Sanctuary regulations. Local, State, and Federal officials should sit on the SAC in an *ex-officio* capacity and inform their constituents of Sanctuary developments.

SAC: Composition, Organization, and Function

The SAC should be strictly advisory in nature, with NOAA retaining full control of Sanctuary administration and management. It should have voting members with a set term of office. The DEIS is unclear about the structure, composition, and function of the SAC. NOAA should formalize the composition and function; define SAC powers, authorities, and duties; and

NOAA Response

The management plan states that the CDF&G is responsible for managing living resources throughout California State waters. CDF&G is also deputized to enforce specific Federal laws such as the ESA, MMPA, and Magnuson Fisheries Conservation and Management Act (MFCMA). Authority to enforce site-specific Sanctuary regulations will be delegated from SRD Headquarters. Designation of the Sanctuary will not eliminate any of CDF&G's existing authority. Instead, the management plan envisions shared management responsibilities between NOAA, CDF&G, and other State and Federal agencies as appropriate regarding resources and uses of the Sanctuary area.

The DEIS/management plan has been revised to clearly state the post-designation roles of NOAA, the State of California, Coast Guard, NMFS and other Federal and State agencies.

Sanctuary Advisory Committee: Participation

NOAA supports the creation of a Sanctuary Advisory Committee. NOAA appreciates the interest and willingness of numerous organizations and agencies that have expressed an interest in participating in the Committee. One of the Manager's first priorities will be to create the Sanctuary Advisory Committee according to the process and guidelines of the Federal Advisory Committee Act (FACA). See Appendix A of FEIS, Volume I. It is NOAA's goal have wide representation on the SAC, and the Manager will consider the comments of all interested parties. NOAA will draft a charter, make membership recommendations to the Secretary of Commerce, and coordinate with the General Services Administration's review of the committee formation and accomplishments.

SAC: Composition, Organization, and Function

The SAC will function strictly in an advisory capacity, with NOAA retaining full control of Sanctuary management. Once the Sanctuary Manager is selected, terms of office, committee composition, and function will be defined in accordance with FACA (see FEIS appendix A).

Issue 17: Military Activities

Comment

Oil and Gas Activities

NOAA should clarify the relationship between Department of Defense (DOD) national defense exemptions of prohibited activities and oil and gas activities.

Any national defense exemption should be tied to a presidential declaration of emergency and a presidential finding that OCS leasing and development within Sanctuary boundaries is necessary to meet emergency needs. This determination should be made by Congress, and not by a presidential finding alone.

Military Training Exercises

Sanctuary regulations should be designed to minimize negative impacts on operational missions.

NOAA's regulations regarding defense activities as stated on pg. 302 of the DEIS state that, "Activities that are not necessary for national defense...such as training exercises and routine vessel operations, are subject to all prohibitions contained in the Sanctuary regulations." This implies that training exercises are unnecessary to ensure unit readiness and should not be included in the FEIS. The statement may be interpreted to mean that boat landings and low-level aircraft operation, which are part of training exercises, would not be prohibited.

NOAA Response

Oil and Gas Activities

The MMS in the Department of the Interior (DOI) is responsible for hydrocarbon development lease sales in Federal waters, not the DOD. MMS is not exempt from prohibited activities, including oil and gas development in the Monterey Bay National Marine Sanctuary.

If an activity is necessary for national defense or law enforcement, the the head of the agency taking the action shall notify the Secretary of Commerce in sufficient time to permit consultation without jeopardizing national defense. If the Secretary of Commerce and the head of the agency taking the action cannot come to an agreement on the proposed action, then the President may intervene and make the final decision. The exemptions provided to DOD for defense or law enforcement activities in the FEIS do not apply to the exploration or development of oil, gas, or minerals as authorized by MMS in the Sanctuary.

Military Training Exercises

NOAA agrees. The regulations have been revised to minimize Sanctuary impacts to DOD operational missions.

The regulations have been revised to clarify Sanctuary impact on all military activities. Sanctuary prohibitions do not apply to DOD activities, however, NOAA is requiring that DOD and the Sanctuary consult to ensure that all activities carried out by DOD minimize Sanctuary impact on resources and qualities. Furthermore, DOD is liable/responsible for taking appropriate actions to respond and mitigate the harm and, if possible, restore or replace the Sanctuary resource or quality. Thus boat landings and low-level aircraft operations could occur after DOD and NOAA have consulted and agreed on how such activities could take place to minimize impacts on Sanctuary resources and qualities.

Table 2. Abbreviations

<u>Abbreviation</u>	<u>Meaning</u>
AMBAG	Association of Monterey Bay Area Governments
ARB	Air Resources Board
ASBS	Areas of Special Biological Significance
CARB	California Air Resources Board
CCC	California Coastal Commission
CDBW	California Department of Boating and Waterways
CDF&G	California Department of Fish and Game
CEQA	California Environmental Quality Act
COE	Corps of Engineers
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
DEIS/MP	Draft Environmental Impact Statement/Management plan
DOD	Department of Defense
DOI	Department of the Interior
EIR	Environmental Impact Review
EPA	Environmental Protection Agency
ESA	Endangered Species Act
ESNEER	Elkhorn Slough National Estuarine Research Reserve
FARs	Federal Aviation Regulations
FEIS/MP	Final Environmental Impact Statement/Management Plan
MFCMA	Magnuson Fisheries Conservation and Management Act
MBTA	Migratory Bird Treaty Act
MMS	Minerals Management Service
MMPA	Marine Mammal Protection Act
IMO	International Maritime Organization
MOA	Memorandum of Agreement
MP	Management Plan
MPRSA	Marine Protection, Research, and Sanctuaries Act

Table 2. Index of Abbreviations

<u>Abbreviation</u>	<u>Meaning</u>
MRPA	Marine Resources Protection Act
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
OCS	Outer Continental Shelf
OPA	Oil Pollution Act
PFMC	Pacific Fisheries Management Council
PG&E	Pacific Gas and Electric
RWQCB	Regional Water Quality Control Board
SAC	Sanctuary Advisory Committee
SEL	Site Evaluation List
SLC	State Lands Commission
SRD	Sanctuaries and Reserve Division
USCG	United States Coast Guard
USF&WS	United States Fish and Wildlife Service
WDR	Wastewater Discharge Requirement

Table 3. Petitions

Subject: Supports Boundary Alternative 5, and the protection of Sanctuary resources from potential oil spills and other harmful human activities. Support management plan 2.

From: Valerie B. King

Signatures: 23

Subject: Supports Boundary Alternative 5. Seeks to prohibit oil drilling within the Sanctuary.

From: Live Oak High School geology class, period 6

Signatures: 19

Subject: Supports Boundary Alternative 5. Seeks to prohibit oil, gas, and mineral exploration and development.

From: Kathy Roth

Signatures: 31

Subject: Supports Sanctuary protection from oil drilling.

From: Live Oak High School geology class, period 4

Signatures: 16

Subject: Supports Boundary Alternative 5 and protection of the Sanctuary from oil development.

From: University of California, University Herbarium

Signatures: 16

Subject: Opposes the Dept. of the Interior's five-year lease plan for offshore oil and gas (California Lease Sale #119). Supports a California Ocean Sanctuary from Mexico to Oregon that would prohibit drilling and toxic dumping offshore.

From: Coastal Concerns

Signatures: 5,860

Subject: Supports Boundary Alternative 5, and seeks to prohibit oil and gas development in the Sanctuary.

From: Coastal Concerns

Signatures: 923

Table 3 cont. Petitions

Subject: Seeks to prohibit oil drilling off California coast.
From: E.A. Hall School Students
Signatures: 22

Subject: Supports Boundary Alternative 5.
From: Seaside Greensleeves Environmental Action Group, Seaside High School
Signatures: 86

Subject: Supports creation of a large marine sanctuary.
From: Seaside High School
Signatures: 9

Subject: Supports Boundary Alternative 5, and seeks to prohibit thrill craft and drift nets. In general, supports NOAA prohibitions. Seeks to increase sewage treatment levels prior to discharge.
From: Tandem Computers, Inc.
Signatures: 40

Subject: Supports Boundary Alternative 5.
From: All Saints Day School
Signatures: 148

Subject: Supports Boundary Alternative 5. Seeks to prohibit offshore drilling. Supports strict regulations of vessel traffic. Seeks to prohibit thrill craft use.
From: Diane Dawson
Signatures: 128

Table 4. Public Hearing Speakers

September 12, 1990
Monterey City Hall, Monterey CA
76 Speakers (3 Unidentified)
In order of appearance

Sylvia Panetta representing Congressman Leon Panetta	George Wilson
Mark Delfiero representing U.S. Senator Pete Wilson	Steven Abbott - PE&G Moss Landing Plant
State Senator Henry Mello	David Tatman
State Senator Henry Mello representing State Senator Milton Marks	Robert Davis - Pacific Grove Museum of Natural History Assoc.
Assemblyman Sam Barnes	John Smiley - Big Creek Reserve
Karen Kauffman - Monterey County Board of Supervisors, AMBAG	Mary Ann Mathews - California Native Plant Society
Sam Karis - Monterey County Board of Supervisors	James Willoughby - American Cetacean Society
Mark Delfiero - Central Coast Regional Studies Program	Peter Miller
Tom Perkins - Monterey County Board of Supervisors, AMBAG	Bill Shepardson
John Vonrees - San Luis Obispo County Board of Supervisors	Abe Sommers
Ruth Freeland - City of Monterey, AMBAG	Martha Norton
Bud Nunn - Pacific Grove City Council	Carol Meyer
Bob Fisher - Carmel-By-The-Sea	Mr. Volenski - Monterey Peninsula Audubon Society
Mr. Takakowa - City of Marina, AMBAG	Kenneth Flood representing his dog, Pilot
Dr. Hughes - Monterey Water Management District	Nancy Dong - Super. of Monterey Peninsula Unified School District
Mr. Musselman - City Council of Gilroy and Morgan Hill	Mike Ebert
Austin Carlton - CalTrans	Eleanor Rogge
John Martin - Member, Congressman Panetta's Steering Committee	Margo Nottenkamper - Monterey Peninsula Water Man. District
Dan Baldrich - Member, Congressman Panetta's Steering Committee	Richard Busich
Joe Stallart - Sanctuary Steering Committee	Jack Wickham - Sierra Club
Steve Webster - Monterey Bay Aquarium	Sara Ellen
Charles Dolmak	Meg Manus
Walter Wong - Department of Health, Monterey County	Bruce Callem
Maggi Weaver	Peter Morrison
Dan Hatfield - Save Our Shores	Mark Langer
Randall Frye	Clay Phipps - Central California Diving Council
Diane Staller	Eric Dartman
Diane Dawson	Donald Morgan
Mark Silberstein - Elkhorn Slough Foundation	Carol Lime
Rachel Saunders - Center for Marine Conservation and Marine Protected Areas Program	Jackie Spjute
Karen Fry	Noel Mapstead
Gregory Silver - Director, Friends of Sea Otter	Mike Fimals
Andy Isabel	Kurt Shorsen
Chris Sulfridge	Lynn Laurensen
Chris Hartsell	Harvey Vanderveer
Mary Nishimoto	Barbara Rainer
	Carl Lyson
	Robert Haney

Table 4 cont. Public Hearing Speakers

September 13, 1990
Veterans Hall Auditorium, Santa Cruz, CA
61 Speakers (11 Unidentified)
In order of appearance

Ken Christopher representing Congressman Leon Panetta
State Senator Henry Mello
Assemblyman Sam Farr
Robin Levy - Santa Cruz County Board of Supervisors
Marty Barnhold - Mayor of Santa Cruz
John Laird - Santa Cruz City Council, AMBAG
Joe Miller - Scotts Valley City Council
Joe Townsend - Santa Cruz Port District
Edward Brown - California Coastal Commission
William Nyuden
Dan Haifley - Save Our Shores
Harold Short
Neil Curtery
Jean Adams
Mike Humerik - Board of Trustees, Save Our Shores
James Galdias
Jane Orbuck
Jennifer DiRossi
Warren Hager
Scott West
Patty Kern
Brenda Laveme
Aura Weis
Jean Byers
Jennifer Taylor
Sharon Unger
Stacy Davis
Cathy Pearson
Ralph Walker
John Tepley
Tony Sloss
Michelle Waters
Tracy Sarrett - Defenders of Wildlife
Michael Webber
Harry Martin
Joan Reiss - Wilderness Society
Terry Traha - League of Women Voters
Mr. Sanders

Melissa Kramer
Bob Corey
Margaret Fussari - USCS Natural Reserves
David Bachman
Jim Lucas - Big Stick Serving Association
Chris Broadwell - Sierra Club
Steve Merrill - Surf Riders Foundation
Mark J. Palmer - Ocean Alliance
Dort Rothfeld - Northern Coast Boys
Ted Albanberg representing 6th graders from Daimar Middle
School
Ron Goodman - Bikes as Alternate Transportation
Mr. Nicari
Susan McBride
Bonnie Wilson
Gail Burke
Lawrence Framhagen - Friends of Prince William Sound
Ava Cinaros
Tappy Timmons
Charles Cunningham
Al Brady
Bob Dunn
Nicholas Ross
Ed Paster

Table 4 cont. Public Hearing Speakers
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September 14, 1990
Half Moon Bay Community Seniors Center,
Half Moon Bay, CA
70 Speakers (3 Unidentified)
In order of appearance

Casey Byer representing Congressman Tom Campbell
Joe Nicodim representing Congressman Tom Lantos
Senator Quentin Kopp
Deborah Bringleator representing State Senator Becky Morgan
Assemblyman Ted Lempert
Tom Nolan - San Mateo County Board of Supervisors
Jim Gonzales - City and County of San Francisco Board of Supervisors
Helen Biddelson - Mayor of Half Moon Bay
David Iverson - City Council Member
Peter Loeb - Mayor of Pacifica
Gary Ortin - City of Belmont Council Member
Dan Haifley - Save Our Shores
Elsa Evans
Charlene Spretnak
Dorothy Torres - Coastal Concern
Rebecca Malfo - Coastal Concern
Mary DeLong
Eleanor Llewellyn - Ocean Protection Coalition
Julia Botts
Paula Ann Vouch
Richard Schram-Beresford-Hillsdale Homeowners Association
Ms. Cass
Gary Strachin - California State Parks Rangers Association of California
William Morris - Off Oil Committee, Sierra Club
Jack Freeland
Sandi Stadler - Wildlife Care Center, Humane Society
Sara Crandall Hoxie - Exploring New Homes Outdoor School
James Riatta
Linda Lewis - Coyote Point Museum for Environmental Studies
Jonathan Stern
Tim Duff - Sierra Club
Sheila Hyman - League of Women Voters
Jill Shallenberger
Eleanor Llewellyn representing Mitch Clogg
Tom Neeson - Marine Biologist, San Francisco State University

Joy Clemens
Iris Creigler
Mary Conkay
Bob Green - Naturalist, Fitzgerald Marine Reserve
Maria Valdez
Mary Hobbs - Sierra Club
Don Geary
Kit Dove
Diane Bowen - Sierra Club
Ann Nothoff - Natural Resource Defense Council
Donald Mayall
Judy Holman
Flo Anderson
Jean Christmas
Mike Ezekiel
Sally Beckman
Margo Tom - La Honda Watershed Council
J.R. Blair - Pigeon Point Lighthouse, AYH Hostel
Susan Jereau
Roby Price
Olive Meyer
Jarry Nansky
Rene Sellkirk
John Mulligan
Ken Beckman
Jean Chambers
Borden Brown
Alan Cypher
Lori Dunn Lilly
Chris Church
Bill Borheim
Clay Phipps - Central California Council of Diving Clubs, Inc.

Table 5. Individual Commentors

**927 Individual Commentors
(20 names illegible on letters)**

Acevedo, Barbara	Bail, Alyssa	Bonstall, Chesley	Carroll, Mollie
Adams, Karole	Balthis, Frank	Boris, Eva Rea	Carroll, Sharon
Adelman, Leon	Balthis, Judy	Boston, Jason	Casafino, Larry
Adelmau, Lucille	Bane, Kay	Bot, James	Case, Andy
Aikeu, Alex	Barcus, Michela	Bott, Julia	Cavalls, Donna Jean
Aia, Francia	Bardacke, Seth	Boyce-Abel, Olesia	Cearas, Carl
Albers, Gerardine	Barlow, Alice	Bragdon, Davis	Ceauford, Paul
Alder, Donald	Barlow, Claude	Breckenridge, John P.	Chainey, Janice
Alder, Margery	Barnard, Jeff	Brighton, Robert	Chainey, W.E.
Alexander, Jean	Barney, Debbie	Brolsin, Stephen C.	Chalardin, Diane
Alongst, Patricia	Barran, Micky	Brown, Bob	Chanoz, Eunice
Altenberg, Edward	Barraza, Albia	Brown, Brian	Chappel, Alfred
Anderson, Helen	Barrington, Todd	Brown, Carl	Chapson, Lois
Anderson, J.R.	Barrows, Shan	Brown, Gwen	Chawru, Gabwrik
Anderson, James	Bartlett, Melanie	Brown, Jill	Chessman, Doug
Anderson, Linda	Batson, Jeff	Brown, Lencuid	Chessman, Gail
Anderson, Patricia	Bauer, Heather	Brown, P.M.	Chen, Allen
Andrade, Hortencia	Beck, Barbara	Brown, Patricia	Chester, John R.
Andre, Ramona	Bell, Ann	Bryant, Jeffery	Chinn, Amy
Andre, Richard	Bell, Norton	Bullock-Wilson, Barbara	Christy, Louise D.
Andrews, Leslie	Bellinfante, L.L.	Bullock-Wilson, Gene	Church, Chris
Andrews, Richard	Bellinfaz, R.J.	Burgess, Ryan	Ciotti, Bob
Angelos, Christopher	Benioff, Jeanne	Burnham, David	Ciranni, M.L.
Ann, Paula	Bernard, Bruce E.	Burnham, Ian	Clement, Jerry
Anomp, A.	Bernard, Jessica	Burns, Peggy	Clark, James
Anthony, Elizabeth	Bernard, Linda	Burns, John	Clark, R.
Arenson, Michael	Berthoin, Paola	Burns, Robyn	Clark, Richard O.
Armandie, Paul	Best, Otto G.	Buss, Richard H. Jr.	Clatis, Trigo
Armon, Art	Bettencourt, John	Butler, Larry	Clogg, Mitch
Askoff, Keith	Bougal, Valerie	Butler, Suzanne	Codd, Elizabeth
Avins, Phillip	Bhasin, Simran	Cabralez, Jose	Coffman, Jennifer
Baarba, Lupita	Bhushan, Judith	Cailliet, Gregor	Coha, June
Bailey, Joshua	Bierce, Monte	Calderon, Hugo	Collins, Nancy
Baker, Ellis	Bias, Jose	Cane, Elizabeth	Cohen, Meigie
Baker, Ellis	Blood, Kenneth	Cantu, Susan	Combes, Craig
Baker, Mandy	Blue, Duncan	Card, Karen	Consul, Ruth
Baker, Sandra	Boch, Noel	Cario, Monica	Contreras, Mariana
Baker, Stephanie	Bocher, Genesier	Carl, Phillip Michael	Corman, Nicole Sage
Bakker, Saude	Boero, Steven P.	Carlson, Wendy	Corman, Thomas H.
Balajay, Muna	Bonner, Norma	Carpenter, Brian	Cornet, Benjamin
Baldock, Barbara	Bonner, William	Carrig, Mary	Cornales, Maribell

Table 5 cont. Individual Commentors

Cote, Joan M.	Di Berardino, Angela	Firschein, Oscar	Glin, Diane
Cowan, Bruce	Domac, Charles	Fisk, Pamela	Glover, Alexander E.
Cowan, Judy	Dongan, Margaret E	Fletcher, Brandon	Gobeca, Marici
Cramer, Sherry	Donhoff, Karyn	Flores, David	Goeser, James
Crandell-Hoxie, Sara	Donovan, Katherine	Flores, Miguel	Goitain, Ernest
Crane, Betty	Doran, Bonnie	Flores, Mima	Goldstein, Sally
Crautor, J.	Dower, Susan	Fong, Dan	Golosman, Bernard
Crawford, Katherine	Doyle, Merrill	Fontana, Nancy	Gonzales, Maria
Crisman, Rachel	Doyle, William T	Foss, Mark	Good, Julia
Crisostomo, Michelle	Dreyfuss, Martin J.	Foxx, Mark	Goodel, Daniel
Culans, Joy	Dritzer, Sherry	Frago, Carmen	Goodenough, Amanda
Cummings, Michael	Drundel, Judy	Frago, Don	Gordon, Lynn
Curich, John	Duffy, James	Fraley, Natasha	Gott, Ken
Curry, Robert	Dugan, Frances J.	Frandoer, Alex	Goyalz, Melissa
Cusac, Anne-Marie	Duggins, David	Frandum, Zachary	Graffy, Elaine
Cutford, Gene	Duran, Jose	Frank, Margaret	Graham, John
Cutler, William	Duran, Melissa	Frankin, Louise	Graham, Marian
Cutshall, Gloria	Dutch, Brenda	Frederick, Edith	Grande, D. Del
Cutshall, S.	Dye, Louise	Freeman, Ginny	Grant, Georgia
Cypher, Allen	E.A. Hall Middle School	French, Edward	Gray, Allen
Damroach, Dave	Eddings, Owen, Jr.	French, Helen	Gray, Donna
Damrosch, Judi	Edmans, Suzanne	Frey, Ernest	Greenblat, Marilyn E.
Dansky, Jeri	Edwards, Steven	Frey, Julie	Greenman, Chris
Davies, Donna	Egill, Diane	Fry, Randal	Greenwald, Joanne
Davis, Charlotte	Eichert, William	Fulton, Carl E.	Greenwood, Robert
Davis, Irene	Eichom, Jules	Fusari, Margaret	Greer, Doug
Davis, John	Eide, LeRoy	Gagn'e, Michael	Greer, Lill
Davis, Rodney	Eisenberg, Elaine	Gallagher, Donna	Gregory, Sylvia
Davis, Sharon	Enslow, Anne M.	Garcia, Yessenia	Gretzinger, Jessie
Dawal, Michelle	Espinoza, Ernest	Gardner, Erin	Greyson, Ann
Dawson, Diane	Etherides, Paul	Garfield, Newell	Grier, Lee McLaughlin
de Ibarra, Kay	Evans, Elsa G.	Garrett, Frank E.	Griffin, Jenny
Deam, Bruce D	Evans, Elsa G.	Gassel, Margy	Griffith, Ronald
Debolt, Dan	Ewing, Jeannette Parkes	Gascomazzi, Dorothy	Griph, Paul
Dedo, Douglas	Ezekiel, Michael	Gehre, Don	Griseto, Thos
Dedo, Susan	Fais, Alice	Gettman, Cindy	Gross, Andrew
Del Grande, D.	Fault, Christan	Gey, Bonnie	Gross, Carol
Del Mar Midd Sch 6 gr	Feder, Judson	Gibboms, Richard L.	Grossman, Linda H.
Delgadillo, Noemr	Feinholz, Michael	Gibson, Anne	Gruber, Don
DeRoussi, David	Feinstein, Dianne	Gibson, Susan	Grulechijones, Alec
Despard, Doug	Felter, Linda	Gidley, Evan J.	Guardaleo, Sandra
Dethier, Megan	Fernazdtz, Cynthia	Giron, Lily	Gudraus, Rita
DeVoe, Marcia	File, B.J.	Glendinning, Mary	Guess, Vicki

Table 5 cont. Individual Commentors

Guilbert-Henry, Mary Lee	Heymann, Gary	Johnson, Casey	Kuehn, Richard
Gulliez, Mandy	Hill, Bree	Johnson, Eric	Kunchy, Edward
Gunderson, Caroline	Hill, William A.	Johnson, Harry	Kwong, Betty
Haggerty-Rigter Family	Hill-Lee, Sandi	Johnson, Linda	LaDuke, Renee
Haltiner, Jeffrey	Hiller, Peter	Johnson, Tom	Lafrentz, John
Haney, Robert	Hilton, Phyllis	Jones, Eleanor	Langner, Mark
Haringer, Gisela	Hitchcock, Linda	Jones, Elizabeth	Larson, Carl
Haringer, Herbert	Hodgins, Pamela	Jones, Herbert	Lathrap, Lesley
Harkway, Caroline	Hofomdehl, R. L.	Juaney, Sigi	Lauerando, David
Harlin, Marilyn	Hogan, Susan	Justice, Martie	Lawson, Janet
Harms, Ceila	Holden, John	Kaehler, Alfred	Lawson, Patsy R.
Harms, Terry	Holland, Barbara	Kaehler, Joan	Lazarotti, James
Ham, Lucy	Honack, Michael	Kaluia, Stafa	Leaf, Thomas
Hamms, B.R.	Home, William Edmond	Kastysal, Stephanie	Lewis, Ceila
Harris, Addison	Horsley, Tom	Kauhanen, Gloria	Lewis, Hilary
Harris, Alice Lee	Hotchkiss, Carol	Keith, Joe	Loyua, Betsy
Harris, Chris	Housman, Audrie	Keller, Catherine	Lezt, Venetta
Harris, David	Housman, Lowell	Kellogg, Jack	Licht, Lazar
Harris, David J.	Houston, Duke	Kenyon, Paulette	Lilly, Jeanne
Harris, DesMar	Howard, Richard	Kershner, Cheryl	Lilly, Robert
Harris, Ester	Hubber, Britt	Kessler, Rory	Lima, Helen
Harris, Rae A.	Huecervio, Yrsinia	Kilston, Vera	Lindsay, Phil
Haskell, Carole	Hull, Arthur	King, Muriel J.	Linger, Eloise
Havlena, Jim	Hull, Dawn	King, Valerie	Lippold, Irma
Hawkins, Quail	Humphrey, Lucia	Kirschner, Judith	Live Oak H. Sch Geo Clas
Hawley, Joan	Hunt, John W.	Klee, Gary A.	Livingston, W.G.
Hayes, Dennis	Hurlburt, Barry	Kline-Kaye, Mary	Loehr, Lincoln
Hayes, Janet	Ibarra, Ivan	Knopf, Mary Gerbic	Long, Madeleine
Hayler, Louise	Ignatroy, Jennifer	Koch, Betty	Lamp, Steven
Hebert, Alan	Ingatroy, Mark	Koeller, Chad	Lape, Adriana Moran
Hebert, Joan	Ingham, Dana	Kollman, David	Lopez, Nicolas
Hekhuis, Dan	Inouye, Lynn	Kojola, Paul H.	Lopez, Paul
Helms, David M	Ireland, Curtis	Kojola, Victoria B.	Lottan, Leok
Hemel, Albert	Ivy, Lee	Kokossoulis, Angeles	Lazo, Glade
Hennig, Laurie	Jackson, Roland	Koloboff, George	Luna, Cesto
Henning, Dan	Jacobson, Marcella	Koloboff, Lana	Lyons, Dr. Kathy
Herald, Dorothy	Jacobson, Margaret	Kovachy, Edward M.	Macias, David
Hernandez, Angil	Jacques, Josh	Kozak, Chuck	Maclellan, Eleanor
Hernandez, Hermelinda	James, Allston	Krazt, Marilyn	Macy, Phyllis
Hershhey, Davis	James, Gerald	Kreger, Allen	Mahr, Carol
Hertel, Brian	Jantrosca, A.	Krikorian, Art	Mahr, Carol
Hess, Robert	Jennings, Carolyn	Kritzer, Sherry	Magana, Maria
Heuman, Donna	Jennings, Lonny	Kruksure, Judith	Makymowicz, Alex

Table 5 cont. Individual Commentors

Malkin, Debra	Melvin, Linda	Nelson, Lynn	Pellegrin, Helen
Mallard, Anne E.	Mendiola, Rosemary	Nelson, Margaret	Pennington, Edith
Mancha, Vanessa	Menoff, Barbara	Nettroy, Ralph	Peoples, Michelle
Mandt, Cheryl	Merk, Martha	Newman, Carol Jean	Pepera, Nickole
Mankowski, Susan	Meyers, Howard	Nichols, William. F.	Persa, Ellen
Manoogian, Jone	Migate, Linda	Nicolet, Travis	Peterhans, Laura
Manor, Essborne	Min, Sherry	Niesen, Thomas M.	Peterhans, Michael
Manuel, Juan	Miller, John	Niksa, Patrica	Peterson, James
Marcussen, Muriel	Miller, T.E.	Nispel, Antony	Peterson, June
Mardel, Mary	Millet, Mrs. E.A.	Noit, Jan	Pett, Andrea
Marguente, Joseph	Milfet, Meryl	Norris, Bill N.	Phillips, Diane
Marino, Gorge	Milus, Sue	Norris, Nancy	Phillips, Doty
Maritano, Family	Minst, Maride	Norton, Adele	Phillips, Jesse
Martinez, Angelic	Minge, Laura	Novbakhic, A.	Phillips, Jimmy Jr.
Marsh, Susan	Mitchell, Bill	O'Neil, L.M.W.	Phillips, Jim
Marshall, Jeff	Monjaras, Beatriz	Oehorn, Juan Jose	Pike, Richard J.
Martinei, Myurna	Monning, Elizabeth	O'Hare, Eileen	Podesta, Jane
Martinez, Monica	Moon, Patricia	Oldakowski, Leah	Popelka, Paul
Martus, Marjorie	Mora, Michael	Oldfield, Beverly	Popelka, Rebecca
Mattson, Phyllis	Morah, Molly	Oleski, Nancy	Popp, Elizabeth
Maule, Nancy	Moran, Cara	Oliva, Mary Jeanne	Porter, Ed
Maule, Nancy	Moran, Janet	Oliveira, Yulte	Porter, Mary
May, Tom	Morgan, Donald	Olmsted, Jean	Potts, Donald C
Mayer, Kate	Morris, Don	Olsen, Marsha	Potts, Richard
Mayo, Lisa M.	Morris, Marilyn	Orme, Derek	Power, Carol
McBride, Lori E.	Morris, Martha	Ortega, Frank	Pronger, Camille
McClain, Gloria	Morse, Charles	Ortolano, Leonard	Putney, E.N.
McCoffray, Keri	Moss, Richard	Osborne, Joy B.	Pyrn, Laura
McCray, Thomas	Moulu, Lynn	Owad, Andrea	Quimby, Helen
McFarland-Brown, Jan	Mowbray, Jake	Ozant, Marsha W.	Quintanilla, Linda
McGee, Joseph	Meaksymowicz, Alex	Padilla, Bobbi	Rabin, Carol
McGlashan, Chuck	Mullen, Juanita	Paga, Caroline S.	Rackages, Van
McGowan, Brooke	Muller, Frederick	Palacios, Melissa	Radu, Mary
McGowan, Sherry	Murdoch, Michael	Palestis, Kathleen	Ragan, Arnie
McLoughlin, Marilyn D.	Murphy, Marty	Palmer, Caroline	Rell, Jacqueline
McMahon, Dietra	Murray, Marie	Pancoast, Harry	Ramirez, Jorge
McNabb, Cynthia	Myers, Gerald M.	Paredaz, Brenda	RamsdenScott, Sidney
McQueen, Neil	Myers, Sheryl	Parker, Bonnie	Randall, Meghan
Meder, Allan	Nakagawa, Necko	Parker, John	Rangel, Rene
Meeks, Josette	Nastund, Nancy	Parker, Sarah	Rasmussen, Gunnar
Melander, Lucille	Nayyar, Robyn	Patterson, Carol Ann	Rawings-Detzeit, Annelies
Melin, Dan	Nelsen, Erik	Payne, Bonnie	Reader, Stephanie
Melvin, Jay	Nelson, Frances	Payne, Richard	Reed, Cynthia

Table 5 cont. Individual Commentors

Reibel, David	Sabedo, Patricia	Short, Harold	Stewart, Sandie
Reithknecht, Angie	Salmon, Jean	Short, Irene	Still, Cas
Renzel, Emily	Sammel, Patrica	Showers, Paul	Storseth, Juhree
Richards, Alice	Samuel, George	Silva, Nicole	Strong, Craig
Rick, David	Samuelson, Ralph	Silver, Daniel	Strong, Robert
Riegel, Lou	Sanchez, Edgar	Siners, Ella	Stuart, Louise
Riemer, Akola	Sanchez, Rosurita	Sing, Craha	Swan, Salt
Roberts, Ruth	Sanchez, Salvador	Skogen, Marion	Swan, Wayne
Roberts, Steve	Sanders, Joyce	Siegel, Shannon	Synder, Helen
Robertson, Mary	Sanders, Rick D.	Sloss, Anthony	Szindl, George
Robinson, Debbie	Sanely, Leslie	Smallem, Martin	Taggart, Thelma
Rocha, Rose	Sapper, Maya	Smith, Celeste	Taggart, Janet
Rocka, Monica	Sathrop, Emily	Smith, Colleen	Tanner, Felicia
Rodriguez, Dalilah	Saucedo, Silvia	Smith, Evony	Tenzing Norgay, Norbu
Rodriguez, Esmeralda	Saxon, Roberta	Smith, Michael Vincent	Tenzing Norgay, Terry
Rodriguez, Patty	Scalmanini, Stephen G.	Smith, Virginia	Tenshy, Bernis
Rodriguez, Robert	Scarr, Dee	Smyth, Ken	Thelen, Dustin
Rodriguez, Sonia	Schaafsma, Jan	Snyder, Silas S.	Thelen, Joan
Roe, Wayne	Schaumann, Leif	Solano, Connie	Thelen, Joseph
Rolander, Lori	Schick, Debra	Somers, Jane	Thom, Craig
Rolski, Jessica	Schiedeck, Jacqueline	Sorci, Justin	Thom, Susan
Rotthafel, Sydnee	Schmidt, Carla Anne	Spak, Margaret	Thomas, Joseph
Rooney, Chris	Schorr, Andrew	Spar, Camille	Thomasen, Elain R.
Rosales, Dsael	Schrechenberger, Eric	Spencer, Joan	Thompson, Katherine
Rosenblum, Larry	Schubart, Peter J.	Spencer, Mark	Thompson, Lucinda
Rosenthal, David S.	Schuetrum, Viola	Spitzer, Cameron	Thompson, Rosemary
Roseulund, Isabelle	Schuler, Deen	Spotts, Richard	Thoresen, Kitty
Ross, Melissa	Schwing, Franklin B.	Spring, Robin	Thrift, Richard
Row, Bonnie	Scott-Von der Muhll, Celia	Springstead, Eric	Thrift, Jean
Row, John	Seltridge, Nancy	Statz, Hilary	Tombs, Carol
Rowe, Catherine	Selkirk, Fannie	Stafford, Kate	Toews, Jim
Royce, Jonathan	Selleck, Kim	Stafford, Mike	Tonison, Nan
Royce, Marjorie	Sepulveda, Wilfredo	Stallings, Faith	Toomey, William Jr.
Royce, Newton	Servos, Kurt	Stanley, Paul	Torrey, Cristy
Rugg, Barbara	Sharp, Tom	Staub, Brenda	Trejo, Judith
Rush, Elizabeth	Shari, Fransaso	Steele, Paige	Tuzzo, Salvatore
Russel, Cindy	Shaver, Frank	Stein, Alan	Vaca, Javier
Russel, L. Marie	Sheldon, Scott	Steiner, Ellen	Van Houten, James
Russell, Cindy L.	Shelton, Allen W.	Steinle, Kathleen Ann	Van Tyle, Eugenia
Russell, Sharon	Shepard, Barberanno	Stardino, John	Van Tyle, Louis
Rustin, J.P.	Sheradown, Sally	Starling, Marion	VanBlaricom, Glenn R.
Ruth, Ferdinand	Sherman, Michael	Stetzel, Claudine H.	Vanderwerf, Barbara
S mith, Michael	Shiraishi, Shari	Stewart, Bob	VanderWerf, Bill

Table 5 cont. Individual Commentors
--

VanHouten, Eleanor	Willis, Linda
Vargas, David	Wilson, Eileen
Vauncian, Rebecca	Wilson, Joe
Vazquery, Michael	Wilson, Randall
Velasca, Veronica	Wilson-Vandenberg, Deb
Verdin, Torres	Winslow, Patricia
Veronica, Claudia	Wod, Irene
Verrou, Gloria	Wood, Harold W.
Vialo, Elena	Woodridge, Diane
Vik, Laura	Word, Alva
Vincent, Kristina	Wortiska, George J.
Vitela, Steven	Wright, Virginia
Volenzuela, Matt	Wright, Annessah
Vondrak, Jane	Wright, David
Waage, Candace	Wright, Tina
Wagner, Amy	Yancey, Barbara
Wahler, Robert	Yancey, James
Waldron, Helen	Young, Brett
Walker, Candace	Young, Caryl
Wallerg, Carol	Young, Daniel
Walton, Ian	Young, Dorothy E.
Weaver, Maggie	Young, George
Weeks, Robert	Young, Mary Ann
Wegrich, Mark	Zachalev, William
Weimer, Marge	Zarate, Laurie
Weingart, Kathleen	Zaucha, Anne
Weinstein, Barbara	Zavetti, Marilyn
Weir, Robert	Zepeda, Lorena
Weiss, Steve	Zingale, Tom
Weiss, Connie	Zito, Terrence
Weissman, Robert	Zitunich, Julie
Wendland, Ann	Zunke, Sally
Westbrook, Charles	
Westbrook, Natalie	
Wett, Irving	
Wilet, Beverly	
Willis, Janis	
Wilkinson, Liza	
Williams, Beverly W.	
Williams, Gordon	
Williams, Scott	
Williams, Wendy	
Willis, Catherine	

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