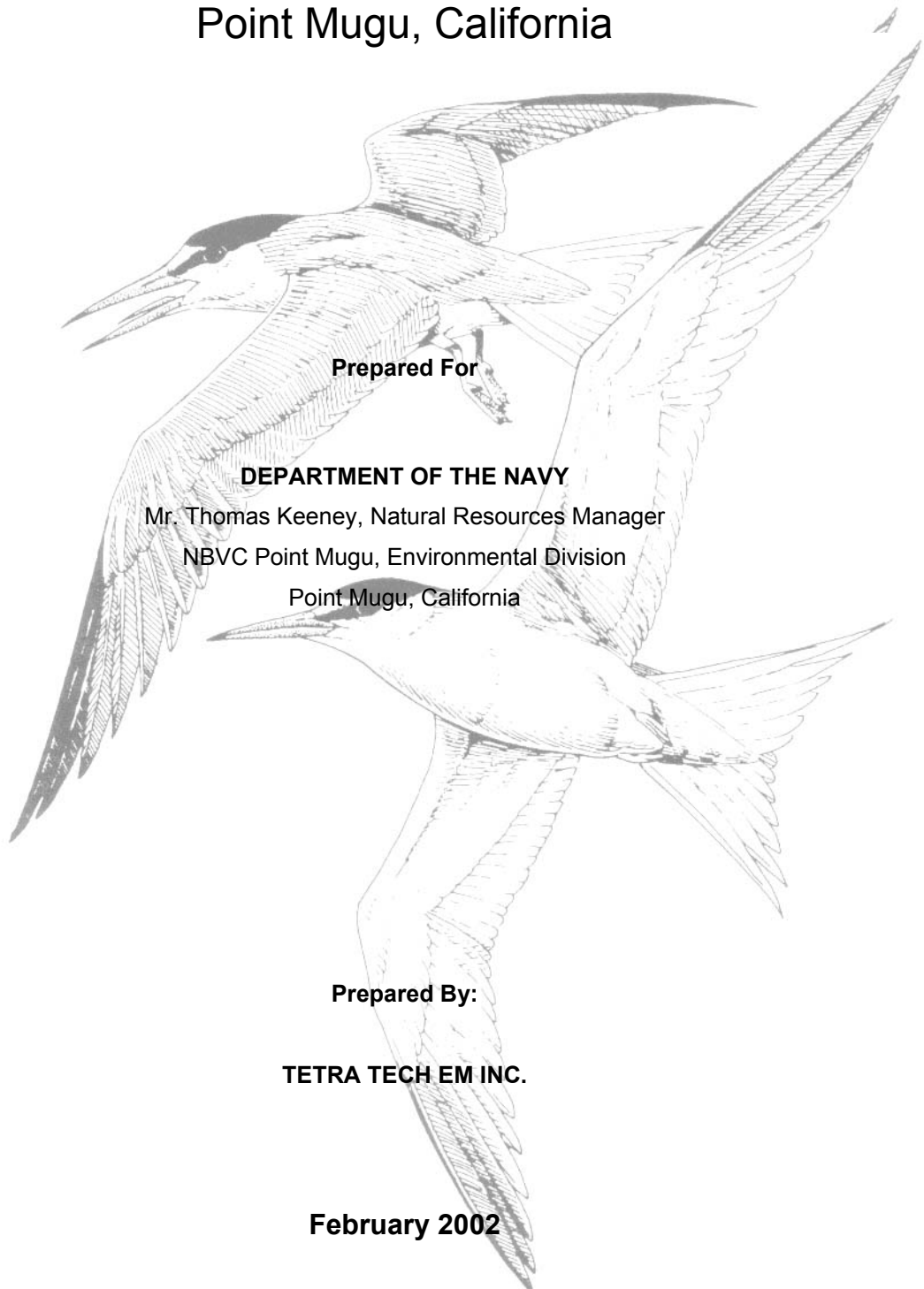


**Final Environmental Assessment for the
Integrated Natural Resources Management Plan (INRMP)
Naval Base Ventura County (NBVC)
Point Mugu, California**

A detailed black and white line drawing of two seabirds, likely albatrosses, in flight. The birds are shown from a side-on perspective, with their wings spread wide. The bird in the foreground is slightly lower and more to the right than the one behind it. Both birds have dark plumage on their heads and necks, with lighter feathers on their bodies and wings. The drawing is highly detailed, showing individual feathers and the texture of the birds' skin.

Prepared For

DEPARTMENT OF THE NAVY

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Prepared By:

TETRA TECH EM INC.

February 2002

**Final Environmental Assessment
for the
Integrated Natural Resources Management Plan (INRMP)
Naval Base Ventura County (NBVC)
Point Mugu, California**

RESPONSIBLE AGENCY: U.S. DEPARTMENT OF THE NAVY

Proposed Action: Implementation of the 2002 INRMP for NBVC Point Mugu,
Ventura County, California

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Abstract: Naval Base Ventura County (NBVC) Point Mugu proposes to implement an Integrated Natural Resources Management Plan (INRMP) consistent with the military use of the property and the goals and objectives of the Sikes Act Improvement Act (SAIA) (16 U.S. C. 670a et seq) of 1997. The intent of the INRMP is to implement an ecosystem-based conservation program that provides for conservation and enhancement of natural resources in a manner that is consistent with the military mission, that integrates and coordinates all natural resources management activities, that provides for sustainable multipurpose uses of natural resources, and that provides public access for the use of natural resources subject to safety and military security considerations. The EA considers two management alternatives: the Proposed Action and No Action Alternative. Because the No Action Alternative does not fulfill statutory requirements under the SAIA for ecosystem-based, long-term natural resource planning, the No Action Alternative was rejected. Based on information gathered during preparation of the EA, the Navy finds that the proposed implementation of the Naval Base Ventura County Point Mugu INRMP would not have significant impacts or reasonably foreseeable cumulative impacts on the quality of the human or natural environment or generate significant controversy.

Executive Summary

Naval Base Ventura County (NBVC) Point Mugu proposes to implement an Integrated Natural Resources Management Plan (INRMP) consistent with the military use of the property and the goals and objectives of the Sikes Act Improvement Act (SAIA) (16 U.S. C. 670a et seq) of 1997. The proposed action would take place in Ventura County, California. The intent of the INRMP is to implement an ecosystem-based conservation program that provides for conservation and enhancement of natural resources in a manner that is consistent with the military mission, that integrates and coordinates all natural resources management activities, that provides for sustainable multipurpose uses of natural resources, and that provides public access for the use of natural resources subject to safety and military security considerations. The management objectives are to integrate natural resources management as practicable and consistent with the military mission and established land uses. Implementing the proposed action would comply with federal regulations and military requirements that mandate adequate protection of natural resources managed by the Navy. The proposed action focuses on a five-year planning period, which is consistent with the time frame mandated by the SAIA, Department of Defense Instruction 4715.3 and Chief of Naval Operations Instruction 5090.1B (Change 2).

The following management alternatives were considered for the proposed action: the Proposed Action and No Action Alternative. The No Action Alternative would continue natural resource management under the existing natural resources practices, Biological Opinions, and routine and emergency maintenance procedures. Although current management strategies provide a net benefit to the natural resources, they are not based on an ecosystem approach or long-term planning guidance for managing resources in conjunction with military missions. Because the No Action Alternative does not fulfill statutory requirements under the SAIA for ecosystem-based, long-term natural resource planning, the No Action Alternative was rejected. The Proposed Action would implement the 2002 INRMP, providing stewardship actions that focus on sustaining military readiness, promoting ecological stewardship and biodiversity, conserving federally listed threatened and endangered plants and animals, protecting the habitat of resident and migratory birds, controlling erosion, and controlling exotic and invasive plant species.

There would be no significant impacts upon any federally listed threatened or endangered species, critical habitat, wetlands, and archeological or historic resources. Management strategies for the federally endangered California brown pelican (*Pelicanus occidentalis*), Light-

footed clapper rail (*Rallus longirostris levipes*), California least tern (*Sterna antillarum browni*); the federally threatened western snowy plover (*Charadrius alexandrinus nivosus*); and candidate species Belding's savannah sparrow (*Passerculus sandwichensis beldingi*) include habitat protection, predator control, additional surveys and studies and bird air strike hazard reduction. Habitat protection would be practiced for other federally listed species including Least Bell's Vireo (*Vireo bellii pusillus*) and salt marsh bird's beak (*Cordylanthus maritimus maritimus*) and the federally delisted species Peregrine falcon (*Falco peregrinus*). Navy has completed informal consultation with the United States Fish and Wildlife Service pursuant to Section 7 of the Endangered Species Act, 16 U.S.C. Sec. 1531.

There would be no significant impacts to surface, ground, or potable waters. There would be no significant impacts from noise, or to public health/safety and air quality. Ventura County is presently designated as a serious O₃ nonattainment area. Pursuant to Section 176 © of the Clean Air Act, as amended, a conformity determination is not required. Most of the activities outlined in the INRMP are exempt from conformity requirements in accordance with 40 CFR 93.153 (c)(2). Prior to implementation, any non-exempt activity would undergo separate analysis to ensure emissions are less than established *de minimis* levels. There would be no impacts to air quality.

There would be no adverse effects to archaeological sites. Pursuant to the requirements of the National Historic Preservation Act of 1966 and 36 CFR Part 800, implementation of the NBVC Point Mugu INRMP would not result in the disturbance, destruction or removal of archaeological materials.

Based on information gathered during preparation of the EA, the Navy finds that the proposed implementation of the Naval Base Ventura County Point Mugu INRMP would not have significant impacts or reasonably foreseeable cumulative impacts on the quality of the human or natural environment or generate significant controversy.

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SECTION 1.0: PURPOSE OF AND NEED FOR THE PROPOSED ACTION

Naval Base Ventura County (NBVC) Point Mugu proposes to implement an Integrated Natural Resources Management Plan (INRMP). The INRMP is a long-term planning document designed to guide the installation in the management of natural resources to support the mission of the installation while protecting and enhancing natural resources for multiple uses, sustainable yield, and biological integrity (U.S. Navy 2002).

This section identifies the proposed action, the responsible agencies involved, and the regulations promulgated under the National Environmental Policy Act (NEPA) and the Sikes Act Improvement Act (SAIA) that guided preparation of this document. In addition to the introduction in Section 1.1, Section 1.2 justifies the proposed action and the decision required for this proposal. Section 1.3 presents an overview of the action and alternative and the resources evaluated in the environmental assessment (EA).

A description of the proposed action is presented in Section 2.0. Section 3.0 contains a description of alternatives to the proposed action. This section also presents a comparative summary of impacts from the proposed action and reasonable alternative in a matrix format.

Later sections describe the proposed action (Section 2.0), the alternatives considered (Section 3.0), the affected environment (Section 4.0), and the environmental consequences of the proposed action (Section 5.0). A comparison of alternatives and conclusions is presented in Section 6.0, and references are listed in Section 7.0. A list of preparers and of agencies and individuals consulted is provided in Section 8.0, and Section 9.0 defines acronyms and technical terms used throughout the EA.

1.1 COOPERATIVE AGENCIES

As a cooperative plan, the INRMP is the product of four regulatory agencies: the Navy, U.S. Department of the Interior Fish and Wildlife Service (USFWS), National Oceanic and Atmospheric Administration National Marine Fisheries Service (NOAA/NMFS), and the California Department of Fish and Game (CDFG). These three agencies are stakeholders in and signatories to the INRMP. While the USFWS and CDFG are the only required signatories under the SAIA, NOAA/NMFS has also been included as a signatory agency because of the

unique marine fishery and harbor seal haulout habitat at NBVC Point Mugu. Other federal and state agencies, including the National Parks Service (NPS) and the U.S. Army Corp of Engineers (USACE), also have provided input to the INRMP, but are not signatory parties.

This document follows regulations promulgated by the Council on Environmental Quality (CEQ) for implementing the procedural provisions of NEPA (40 Code of Federal Regulations [CFR] Parts 1500-1508) and is written in accordance with Department of Defense, Navy procedures manual OPNAVINST 5090.1B (U.S. Department of Defense 1999).

1.2 PURPOSE AND NEED

The purpose of the proposed action is to modify the existing Natural Resources Management Plan and practices at NBVC Point Mugu to develop and implement an INRMP consistent with the military use of the property, with no net loss of installation land, and to meet the goals and objectives established in the Sikes Act (as amended). The goal of the INRMP is to implement an ecosystem based conservation program that provides for conservation and rehabilitation of natural resources in a manner that is consistent with the military mission; integrates and coordinates all natural resources management activities; provides for sustainable multipurpose uses of natural resources; and provides for public access for use of natural resources subject to safety and military security considerations. The management objectives are to integrate fish and wildlife management, land management, and management for outdoor recreational opportunities, as practicable and consistent with the military mission and established land uses.

The proposed INRMP would be implemented at NBVC Point Mugu to support the Navy and DoD mission through responsible stewardship of the installation's natural resources using integrated natural resources management and principles of adaptive ecosystem management. These approaches will be used to promote the viability and biodiversity of the ecosystem while supporting compatible multiple uses. In addition, recommendations in the INRMP would serve as a tool that would enable the base to ensure compliance with federal and state regulations that affect the natural resources management program.

Implementation of the INRMP would provide a plan that would direct the natural resources program at NBVC Point Mugu to gather, analyze, and disseminate information on base ecology; and promote wise stewardship and improved understanding of ecological systems and the

benefits they provide. This approach would provide reliable ecological data and help identify trends and causal relationships between natural resources and their management at the installation.

The need for implementation of an INRMP at NBVC Point Mugu is directed by statutory and regulatory requirements. In 1997, Congress enacted the SAIA, which instructs federal fish and wildlife agencies to promulgate regulations that would improve management of natural resources at DoD installations. The most significant change to the Sikes Act in the new SAIA was the requirement for military installations to prepare and implement an INRMP. The INRMP differs from past cooperative plans in that it must be developed using an adaptive approach to ecosystem management to balance the use of natural resources with the military mission and land use requirements of the installation

1.3 SCOPE OF THE DOCUMENT

This document was prepared in accordance with the guidance and requirements described in Section 1.1 to evaluate the impact of the proposed INRMP at NBVC Point Mugu. The scope of the EA addresses potential impacts to the biological, physical, and human environs of the affected areas from implementation of the INRMP.

The geographical scope of the proposed action is shown on Figure 1-1 (in pocket) and includes the area within the property boundaries of NVBC Point Mugu, with particular emphasis on undeveloped areas. This EA examines the Navy's preferred alternative (implementation of the INRMP) and the no action alternative to evaluate the environmental consequences for NBVC Point Mugu.

The administrative scope of the proposed action would include implementation of policies designed to achieve the following goals, as defined in Chapter 4 of the INRMP (U.S. Navy 2002):

- Goal 1: Restore and maintain ecosystem viability through an Integrated Natural Resources Management Plan that balances military mission sustainability.*
- Goal 2: Continue to conserve populations of federal endangered and threatened plant and animal species within the guidelines of ecosystem management and cooperate with CDFG on conserving state listed species.*
- Goal 3: Protect, maintain, and improve soil and water quality.*

Goal 4: Continue to develop and maintain a thorough data collection and processing system providing efficient data storage, retrieval, and presentation to facilitate fully informed management decisions.

Although implementation of the INRMP is intended to ensure ecosystem management installation wide, the administrative and geographic scope of the proposed action emphasizes specific habitat areas and related projects for natural resources within the base. The INRMP identifies the following Management Emphasis Areas (MEAs) for special attention: wetlands, shorebirds, special status listed species, and primary surface areas such as airfield operations areas. In addition, management measures for the following categories of natural resources and projects are identified and prioritized in the proposed INRMP:

- Special status listed species
- Wetland restoration
- Fish and wildlife management
- Soil and water management
- Bird aircraft strike hazard projects
- Outdoor recreation projects

The alternative to the proposed action evaluated in this EA is the no action alternative. Under the no action alternative, the proposed INRMP would not be adopted, and NBVC Point Mugu would manage natural resources under the requirements stipulated in the USFWS Biological Opinion (USFWS 2001b) and other pertinent regulations and policies.

1.4 ISSUES OF CONCERN

Issues of concern raised during the scoping process and consultation with other agencies include:

- Impacts of the INRMP on the mission of the installation
- Impact of the INRMP on the bird aircraft strike hazard (BASH) program
- Inclusion of adequate provisions in the INRMP to ensure continued compliance with the Endangered Species Act (ESA) and the USFWS Biological Opinion (USFWS 2001b)
- Inclusion of adequate provisions in the INRMP to ensure compliance with the USACE requirements for management of jurisdictional special aquatic sites (SAS), including disturbance, degradation and loss of SAS habitat, damage from invasive exotic plants, wetland restoration, tidal influx, sedimentation in Mugu Lagoon, and migratory bird staging areas;

SECTION 2.0: DESCRIPTION OF THE PROPOSED ACTION

The U.S. Navy proposes to implement an INRMP designed to guide the natural resources management program at NBVC Point Mugu from 2002 through 2006 (U.S. Navy 2002). The U.S. Navy proposes to implement the proposed action. This INRMP would allow NBVC Point Mugu to achieve its goal of supporting the military mission, ensuring the sustainability of desired conditions on military lands, and maintaining the viability of the ecosystem. In addition, the INRMP would help to ensure that conservation measures for natural resources and Navy activities on NBVC Point Mugu land are integrated into and consistent with federal stewardship requirements. As a cooperative plan, the INRMP entails coordination among four agencies, the U.S. Department of the Navy; the U.S. Department of the Interior, USFWS and NOAA NMFS; and CDFG.

2.1 GOALS AND POLICIES OF THE INRMP

The SAIA specifies that an INRMP must be developed based on an adaptive ecosystem management approach, taking into account mission requirements and other land use that affects the installation. As described in the proposed plan, several of the goals of integrated natural resources management would be shaped by: the military mission, DoD guidelines and directives, pertinent laws and regulations, public needs and values, ecological theory, and management experience.

In addition, conservation measures in the proposed INRMP would sustain fish and wildlife management programs at NBVC Point Mugu and integrate the natural resource and military activities to support both missions. Ecosystem management principles, when implemented, would also protect and enhance aquatic and terrestrial habitats that support endangered, threatened, or rare species of plants and animals.

Optimal environmental conditions are essential to the success of the military mission at NBVC Point Mugu. The management measures in the INRMP were developed through analysis of current conditions of the natural resources and the anticipated military mission from 2002 to 2006. Although this plan focuses on management of natural resources at NBVC Point Mugu for the next 5 years, the management measures in the INRMP would provide a solid foundation to

address long-term sustainability of the resources and the conservation issues that pertain to the status of NBVC Point Mugu.

2.2 PROPOSED NATURAL RESOURCES MANAGEMENT

Most natural resource areas at NBVC Point Mugu are associated with Mugu Lagoon, a 2,500-acre estuarine coastal salt marsh that provides food, nesting, sheltering, breeding, and nursery habitat for numerous species of benthic invertebrates, fish, birds, and plants. These habitat types are composed of beach and dunes, intertidal mudflat and sandflats, intertidal salt marsh, estuarine channels and tidal creeks, non-tidal salt marsh, salt pannes, brackish and freshwater marsh, transitions from upland to wetland, mixed transition disturbed, sandy nest islands, and submerged aquatic areas. Seven federal and state listed species occur at NBVC Point Mugu (Keeney and Ball 1998).

The proposed INRMP for NBVC Point Mugu would be used as a tool to ensure that planning for the installation is carried out in harmony with the goals of restoring and maintaining the long-term sustainability, diversity, and productivity of the ecosystem. Planning guidelines in the INRMP are organized according to two management groups that are: (1) general and apply installation wide, and (2) specific to designated MEAs, and that may not apply installation wide. The general management guidelines are predicated on a system of constraints in planning for each of the land classification (resource) areas on base (Figure 2-1). Installation-wide issue areas addressed in the INRMP are summarized in Section 2.3. Some issues addressed in this EA encompass more than one MEA. Specific MEAs are described in Section 2.4. Specific proposed actions associated with the issue areas and the MEAs are summarized in Table 2-1. Issues of concern that drove development of installation-wide management guidelines and management emphasis areas are summarized below.

2.2.1 Jurisdictional Special Aquatic Sites and Wetland Restoration

The INRMP describes current activities for restoration of wetlands and proposed activities to mitigate impacts to jurisdictionally delineated wetland habitats. These projects play a critical role at NBVC Point Mugu, both as a legal requirement to mitigate damage to or loss of wetlands and as a key component of ecosystem management by improving the habitat for species that

Figure 2-1

depend on the Mugu Lagoon for survival during some or all of their life cycle. Seven restoration sites at NBVC Point Mugu would be managed under the proposed INRMP: L1, L2, LAG4, South J, Oxidation Ponds, 31st Naval Construction Regiment (NCR) Small Arms Range, and the proposed Las Posas site. The seven sites and their associated reference sites are described in Chapters 5 and 6 of the INRMP and are presented in Figure 2-2. Each of these sites has already been restored to wetland habitat except the proposed Las Posas site and oxidation ponds. Under the INRMP, all restoration sites would be maintained and monitored in perpetuity as a part of the Navy's legal responsibility to USACE to comply with the Clean Water Act (CWA) (33 U.S.C. Part 1344).

2.2.2 Fish and Wildlife Management

The INRMP proposes an evaluation of fish and wildlife at NBVC Point Mugu to support more effective management of this natural resource. Several critical data gaps require additional research and monitoring to develop a better understanding of fish and wildlife resources at NBVC Point Mugu. Studies described in the proposed INRMP offer a method for filling data gaps and include species-specific investigations as well as general group-specific studies (U.S. Navy 2002). The new data would foster the success of ecosystem management and would aid the Navy in meeting the requirements of CDFG, USFWS, NMFS, and USACE.

2.2.3 Soil and Water Management

The INRMP proposes to initiate studies of the hydrodynamics (or tidal flux) within the Mugu Lagoon and investigations of features such as Calleguas Creek and the submarine canyon that influence sediment deposition. The INRMP would foster this regional ecosystem management approach to better understand factors that influence the ecosystem at NBVC Point Mugu. Water management projects would integrate with other efforts managed by the Environmental Division at NBVC Point Mugu, particularly with storm water pollution prevention and wastewater management.

Figure 2-2

2.2.4 BASH Projects

Bird Aircraft Strike Hazard (BASH) is a major issue of concern to both flight operations and natural resources management at NBVC Point Mugu. A BASH Plan has been developed at NBVC Point Mugu. Some of these measures have no significant impact on natural resources, but others have a potentially significant impact on resources that may trigger the need for an environmental assessment or biological consultation with regulatory agencies that include USFWS, CDFG, NMFS, and USACE. The proposed INRMP provides recommended activities that include mitigation and compensatory measures based on a thorough understanding of the conditions that propel BASH issues and coordination of BASH projects with the Bird Hazard Working Group (U.S. Navy 2002).

2.2.5 Migratory Bird Management

Under the INRMP, NBVC Point Mugu would continue to support the regulations and conventions that involve migratory birds by integrating conservation principles, measures, and practices into installation activities and by avoiding or minimizing, to the extent practicable, adverse impacts on migratory birds and their habitat. Many non-listed species of migratory birds would undoubtedly benefit from the management guidelines established in this INRMP for threatened and endangered species, and from the reasonable and prudent compensatory measures established in the Biological Opinion.

Management of impacts to migratory birds from collisions between birds and aircraft is addressed in the BASH Plan (Appendix G of the INRMP). Migratory bird management guidelines under the INRMP include:

- Follow the procedures established in the depredation permit process, including notification of USFWS before an action is undertaken that may result in the take of migratory birds and before reporting annually to USFWS on the numbers of each species taken under the permit.
- Develop and implement principles, standards, and practices designed to lessen the amount of species takes to the extent practicable.
- Ensure that environmental analysis of proposed actions considers migratory birds and their habitat.
- Restore and enhance the habitat of migratory birds as practicable.

- Control the spread and establishment of exotic animals and plants that may affect migratory birds by decreasing the function and value of their habitat.
- Align base management practices with the management goals of Partners-in-Flight, U.S. National Shorebird Plan, North American Waterfowl Management Plan, Council for the Conservation of Migratory Birds, and the North American Colonial Waterbird Plan to the extent practicable.
- Evaluate the potential to introduce standardized and consistent monitoring protocols for waterbirds (see Section 7.3.2).
- Promote research and information exchange related to the conservation of migratory bird resources, such as the multi-organization, Discovery for Recovery headed by the USGS Western Ecological Research Center.

2.2.5 Outdoor Recreation Projects

The INRMP process involves coordination of integrated natural resources management with the military mission, including multiple use requirements such as opportunities for outdoor recreation. The opportunity for outdoor recreation enables an installation to share its aesthetically pleasing environment and support the morale and welfare of its community. Integration of recreational opportunities into the INRMP has been supported through coordination with the NPS Santa Monica Mountain National Recreation Area (SMMNRA), as well as with USFWS and CDFG. Considerations for projects involve public accessibility, consumptive (waterfowl hunting and fishing) and non-consumptive (bird watching, camping and picnicking) activities, and future demands for outdoor recreation, including the proposed Mugu Lagoon Visitor Education Center.

2.3 INSTALLATION-WIDE MANAGEMENT GUIDELINES

The planning guidelines set forth in this subsection are predicated on a system of constraints on planning for each of the land classification types described below. Natural resources are cataloged in the proposed INRMP, and geographic information system (GIS) coverages have been prepared to show areas of occurrence and habitat needs to minimize conflicts between integrated natural resources management and base-wide planning needs. The analysis was used to prepare constraints recommended on natural resource planning for NBVC Point Mugu. Presentation of these constraints in a map is intended to reduce conflicts between natural resource protection and planning needs. Should planning needs supercede resource protection, these constraints would inform planners of appropriate mitigation measures.

2.3.1 Natural Resource Constraints Map

The proposed action would include a Natural Resources Constraints Map intended to serve as a general guide to delineating areas on NBVC Point Mugu where natural resource constraints may be a factor in developing plans. Land at NBVC Point Mugu would be categorized into five separate “constraint type” areas based on the presence of various natural resources.

Constraint types are categorized as Type I through Type V, with Type I areas the most ecologically sensitive and therefore the focus of the highest degree of constraints.

Natural resource factors that would influence constraint type areas and hence land use at NBVC Point Mugu were identified by establishing priorities based on the status of the resource and on compliance requirements, and by assigning associated weighted numeric values. Natural resource factors in their weighted order of importance from highest to lowest include:

- Light-footed clapper rail habitat areas
- Western snowy plover usage areas
- Wetland restoration site boundaries
- Salt marsh bird’s-beak current and historical areas of growth
- California least tern feeding and breeding areas
- Wetland function category 1
- Wetland function category 2
- Wetland function category 3
- Harbor seal hauling out areas
- Brown pelican roosting and foraging areas
- Belding’s savannah sparrow usage areas
- Areas with recorded bird species density that exceeds 90
- Wetland function category 4

The Natural Resource Constraints map characterizes the sensitivity of areas around the installation based on the weighted natural resource factors and defines constraint type areas based on land use limitations (Figure 2-1).

The resulting constraint type areas shown on Figure 2-1 (Types I through Type V) are derived by first establishing a zero-point (baseline) sensitivity where natural resources are insignificant, (essentially developed areas). From this point, each natural resource factor listed above is layered onto the baseline, beginning with the lowest priority and working up. As new factors are added onto the scale, the balance of sensitivity is tipped and constraints increase. A specific area of land is elevated from one constraint type to the next by the addition of one or more natural resource factors depending on their weighted numeric value. Typically, driving factors for the Type I and II constraint levels are as follows: habitat for the light-footed clapper rail drives Type I constraints, and the western snowy plover and wetland restoration sites and mitigation banks drive Type II constraints. Multiple combinations of the lower nine natural resources factors drive the remaining three constraint levels.

2.3.2 Natural Resource Management Guidelines

Implementation of installation-wide management guidelines in the proposed INRMP would provide a strategy of specific recommended procedures for NBVC Point Mugu planners and program managers to apply throughout the base that would protect habitat and wildlife. The INRMP does not propose to require these guidelines; rather, they would serve as recommended procedures for specific courses of action. Guidelines are proposed for the following resources and activities are described in detail in Chapter 5 of the proposed INRMP.

- Threatened and Endangered Species
- Wetland
- Fish and Wildlife
- Soil and Water Resources
- Coastal Resources
- Facility Maintenance

2.4 MANAGEMENT EMPHASIS AREAS

Because of the large size of NBVC Point Mugu's resource base, as well as staffing and fiscal limitations, MEAs are developed in the INRMP to aid in strategic planning and prioritizing the direction of natural resources management. MEAs would be a tool to integrate natural resource management with other planning at the installation, such as the Public Works Planning Branch.

Proposed MEAs are described in detail in the INRMP (Navy 2002). The eight MEAs described below are proposed for implementation in the INRMP.

2.4.1 Wetland Restoration Management Emphasis Area

There are seven wetland restoration sites within the program, most of which have been restored to full wetland habitat (Figure 2-2). Successful restoration and maintenance of each of these sites is critical to fulfill NBVC Point Mugu's legal commitments under the Clean Water Act Section 404 permitting process with USACE, Section 401 of the Clean Water Act, and the Coastal Zone Management Act under the California Coastal Commission. These sites are described in Section 6.1 of the INRMP and under the Affected Environment Section (Section 4.6.2) of this EA.

2.4.2 Shorebird Management Emphasis Area

The term "shorebird" is applied in North America to a large group of birds that includes, for example, species such as sandpiper, plovers, oystercatchers, avocets, and stilts. Fifth-three species of shorebirds occur regularly in the U.S. Forty occur regularly within the Pacific Flyway; of those, 19 are identified regionally as species of high concern (for example, the black oystercatcher, common snipe, dunlin, greater yellowlegs, and sanderling) (Brown and others 2000).

The loss of salt marsh estuary habitats in other southern California estuarine environments is a primary concern for conservation of shorebirds at NBVC Point Mugu. This MEA would be created to focus on protection, restoration, and enhancement to meet key goals for this habitat. The MEA would encompass habitat known or suspected to be important to shorebirds at Mugu Lagoon. Implementation of future restoration and enhancement programs may result in inclusion into the MEA of areas that are now only suspected to be important. Restoration would focus on restoration of tidal regime, removal of exotic species, and enhancement of estuarine habitat types.

This management area would integrate management practices that are beneficial to shorebirds into current installation management practices based on research in shorebird conservation. In part, integration would require coordination among multiple partners because no single conservation initiative for shorebirds can be effective on its own.

2.4.3 Salt Marsh Bird's-beak Management Emphasis Area

The primary objectives of establishing an MEA for the salt marsh bird's-beak would be to protect, maintain, and increase the population of salt marsh bird's-beak to facilitate eventual removal of the plant from the federal and state Endangered Species Lists. The major premise of this objective is that full recovery and ultimate delisting of the salt marsh bird's-beak at the federal and state levels could be achieved by restoring, protecting, and maintaining the estuarine ecosystem the plant depends on for existence. Mugu Lagoon is one of the few estuarine ecosystems that remain in southern California. Therefore, the eventual de-listing of the salt marsh bird's-beak could be most easily attained by restoring, protecting, and maintaining the essential habitat in Mugu Lagoon.

2.4.4 Light-footed Clapper Rail Management Emphasis Area

The primary objective of establishing an MEA for the light-footed clapper rail would be to support recovery of the species to ensure compliance with federal and state regulations under the ESA as well as to increase the population of light-footed clapper rail. These actions would reduce NBVC Point Mugu's risk of violating ESA compliance requirements as a result of military operations and activities.

The final recovery plan (USFWS 1985a) states that the light-footed clapper rail could be considered recovered when the breeding population is increased to (and maintained at) a minimum of 400 pairs. It is assumed that the population could be increased by preserving and restoring 4,000 acres of wetland habitat suitable for the species in 15 or more coastal marshes. The MEA for the light-footed clapper rail at NBVC Point Mugu would be based on the distribution of clapper rail nesting sites and the presence of suitable habitat within Mugu Lagoon.

2.4.5 Western Snowy Plover Management Emphasis Area

The primary objective of establishing an MEA for the western snowy plover would be to support recovery of the species to ensure compliance with federal and state ESA regulations. It also is

intended to increase the population of snowy plovers to reduce NBVC Point Mugu's risk of violating ESA compliance requirements as a result of military operations and activities.

The final recovery plan (USFWS 2001a) states that the western snowy plover can be considered recovered when the following three criteria have been met: (1) 3,000 breeding pairs have been established, distributed among six recovery units located on in California, Oregon, and Washington, and maintained for 10 years; (2) a 5-year average productivity of at least one fledged chick per male in each recovery unit is maintained during the last 5 years before the species is delisted; and (3) participation plans are put into place among cooperating agencies, landowners, and conservation organizations to assure protection and management of breeding, wintering, and migration areas to maintain the subpopulation sizes and average productivity specified in criteria 1 and 2. Mugu Lagoon will contribute to this objective. The MEA for the western snowy plover is based on the distribution of nesting sites as well as on areas of critical habitat designated by USFWS.

2.4.6 California Least Tern Management Emphasis Area

The primary objective of establishing an MEA for the California least tern would be to support recovery of the species to ensure compliance with federal and state ESA regulations. It also would be intended to increase the population of California least terns to reduce NBVC Point Mugu's risk of violating ESA compliance requirements as a result of military operations and activities.

The recovery plan for the California least tern (Keeney 2001b) states that the California least tern can be considered recovered when the breeding population in California increases to at least 5,000 pairs and remains statistically stable or increasing, on average, for a subsequent 5-year period. In addition, the five stable clusters of nesting sites that make up the current nesting pattern must be simultaneously maintained.

The MEA for the California least tern would be based on the distribution of nesting sites, excluding the nesting islands. Specific management activities for the least tern would take priority along the strip of beach on the western arm of Mugu Lagoon (Ormond Beach).

2.4.7 Tern/Black Skimmer Nest Island Management Emphasis Area

The LAG4/Mitigation Bank Nesting Islands would be set aside as nesting habitat for seabirds in the *Laridae* family with particular concern for terns and black skimmers. Because of the importance of the restored habitat to shorebird nesting, these two islands would be grouped into the MEA for the Tern/Black Skimmer Nest Island and would not be a part of the MEA for the California least tern. Although the islands have supported successful breeding by the federal and state listed California least tern, they serve a larger function as important breeding habitat for elegant terns and black skimmers. The unique conditions (that is, management issues) of the nesting islands would warrant their treatment as a separate MEA, the Tern/Black Skimmer Nest Island MEA.

2.4.8 Primary Surface Area Management Emphasis Area

Four runways at NBVC Point Mugu support aviation as a primary aspect of the military mission (Figure 1-1). The area that incorporates these runways, which extends 750 feet from the centerline, are defined as the primary surface area. Outside of the primary surface area, but still a significant part of the airfields, are the approach zones at the ends of Runways 21 and 3. The combined areas would be designated the Primary Surface Area MEA. These areas would be designated an MEA because of the number of aircraft operations that occur at NBVC Point Mugu and their close proximity to natural resources. In addition, aircraft operations are one of the two important functions of the Navy mission at Mugu Lagoon (the other being missile launch operations).

Aircraft operations affect movement of birds in several ways, but in turn, movement of the birds also affects aircraft operations. Birds migrate on general paths, such as the Pacific Flyway, twice per year. Although migration of birds to breeding areas and wintering sites is obvious, the groups or species of birds and the height of their local migration paths are not well understood. A better understanding of local migratory pathways and behavior of birds is necessary to integrate this natural activity with the military mission. The driving issue that stems from this relationship is BASH. The INRMP would address the BASH issue, in part through a Hazard Risk Assessment (HRA) or Wildlife Hazard Assessment.

2.5 SUPPORT FOR AND IMPLEMENTATION OF THE INRMP

Command support would be required for successful implementation of the natural resources management projects described in the INRMP and summarized in Table 2-1. Command support is currently in place for portions of the INRMP that implement the programmatic biological opinion (BO). A final INRMP would have the full support of the installation Commanding Officer and other personnel in decision-making positions at NBVC Point Mugu. The proposed INRMP implementation plan is provided in Appendix A.

The INRMP identifies the organizational resources necessary to implement the natural resources management program at NBVC Point Mugu. The Environmental Division (Natural Resource Program Manager) would have the primary role and responsibility for implementing the INRMP. The Natural Resource Manager could require assistance from installation personnel as well as from the Public Works Department. Other military organizations such as USACE, as well as other federal and state resource agencies, universities, and public organizations, provide additional support in natural resources management to NBVC Point Mugu. Potential changes in the organization or staff necessary to implement the INRMP include the addition of field biologists and task managers for restoration and monitoring projects.

2.6 PROJECT AND PROGRAM PRIORITIES

The Office of the Secretary of Defense considers funding for preparation and implementation of this INRMP, as required by the Sikes Act, a high priority. However, not all projects identified in the INRMP would receive immediate funding, and some projects may not be fully funded at certain times because of financial constraints. Therefore, projects that require funding to be implemented have been assigned to one of five categories based on Chief of Naval Operations (CNO) Funding Guidelines provided in the Program Objective Memorandum (POM) Fiscal Year 2004 Naval Environmental Requirements Guidebook: Level 1 Projects (Legal Requirement), Level 2 Projects (Navy Policy), Level 3 Projects (Pending Legislation), Level 4 Projects (Future Requirements), and Level 5 Projects (Leadership Initiatives). Ranking levels are described in detail in Appendix A.

The proposed INRMP would be implemented in accordance with Federal Acquisition Regulation (FAR) 32.702 that states: "No officer or employee of the government may create or authorize

an obligation in excess of the funds available, or in advance of appropriates (Anti-Deficiency Act, 31 U.S.C. 1341) unless otherwise authorized by law.” FAR 32.702 also requires that prior to executing any contract, the contracting officer shall (a) obtain written assurance that adequate funds are available or (b) expressly condition the contract upon availability of funds (in accordance with FAR 32.703-2).

Any requirement for the obligation of funds for projects proposed in this INRMP would be subject to the availability of funds appropriated by Congress, and none of the proposed projects would be interpreted to require obligation or payment of funds in violation of any applicable federal law, including the Anti-Deficiency Act, 31 USC §1341, et seq. In addition, proposed projects determined to have potential significant impacts on the military mission or on natural resources would undergo further environmental review prior to implementation.

Table 2-1 summarizes projects proposed for implementation as part of this Plan. Management measures identified in the INRMP are primarily a matter of policy and do not require specific funding to be set aside would be implemented immediately or at a time appropriate to the activity.

Throughout the life of the INRMP, annual funding necessary to implement the INRMP would be calculated by the Natural Resource Manager based on proposed monitoring activities and projects. The Environmental Division would submit these requirements through the EPR process for funding. Costs would vary from year to year depending on project needs. Variables that could affect the overall cost of implementation include changes in labor and contract costs, the availability of funds, and changes in mission activities.

Table 2-1 Implementation Summary for INRMP Projects

Action ¹	Purpose	Priority ²	Requirement	Fiscal Year Goal
<i>Threatened and Endangered Species Projects</i>				
Annual population monitoring of special status listed species	This project is a protective and compensatory measure established to monitor the demographic population status of listed species at NBVC Point Mugu and to ensure compliance with the Endangered Species Act (ESA) and the Programmatic Biological Opinion.	Level 1	Endangered Species Act Fish and Wildlife Conservation Act Migratory Bird Treaty Act OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73	Ongoing
Installation of signs and fencing to restrict access to areas occupied by listed species	This project is a compensatory measure under the Programmatic Biological Opinion. Signs and fencing shall be installed to restrict access to areas occupied by listed species and fitted appropriately to discourage perching by predatory birds.	Level 1	Endangered Species Act Fish and Wildlife Conservation Act Migratory Bird Treaty Act OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73	2001 (ongoing)
Light-footed Clapper Rail Captive Breeding and Enhancement Program	This is a compensatory measure under the Programmatic Biological Opinion. The captive breeding program is important for the recovery of the clapper rail (juvenile and egg translocation).	Level 1	Endangered Species Act Fish and Wildlife Conservation Act Migratory Bird Treaty Act OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73	2002 (ongoing)

Table 2-1 Implementation Summary for INRMP Projects (Continued)

Action ¹	Purpose	Priority ²	Requirement	Fiscal Year Goal
<i>Threatened and Endangered Species Projects (continued)</i>				
Nonnative plant eradication	Nonnative plants (giant reed and iceplant, for example) compete with native plants for space and survival. U.S. Fish and Wildlife Service (USFWS) Programmatic Biological Opinion has required removal and control of all nonnative plants at Mugu Lagoon.	Level 1	Executive Order (EO) 13112 Federal Noxious Weed Act National Invasive Species Act OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73	2003
Holiday Beach asphalt parking lot removal	This activity is a part of the project description for the biological opinion for the western revetment seawall repair project. This project would entail removal of the asphalt parking lot at Holiday Beach and restoration of sandy areas to create additional nesting habitat for the western snowy plover.	Level 1	Endangered Species Act Fish and Wildlife Conservation Act Migratory Bird Treaty Act OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73	2001 (ongoing)
Pad Alpha habitat restoration (1)	This is a compensatory measure under the Programmatic Biological Opinion. This project would remove all catapult berms in the area and restore the habitat to sandy beach for the western snowy plover.	Level 1	Endangered Species Act Fish and Wildlife Conservation Act Migratory Bird Treaty Act OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73	2003

Table 2-1 Implementation Summary for INRMP Projects (Continued)

Action ¹	Purpose	Priority ²	Requirement	Fiscal Year Goal
<i>Threatened and Endangered Species Projects (continued)</i>				
Pad Alpha habitat restoration (2)	This project would restore native habitat for western snowy plover and light-footed clapper rail. Natural resources staff is working with the Planning Branch to remove all structures and restore the area to sandy beach and spiny rush for western snowy plover and light-footed clapper rail.	Level 1	Endangered Species Act Fish and Wildlife Conservation Act Migratory Bird Treaty Act OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73	2005
Implement predator management plan	Predator management is a compensatory measure under the Programmatic Biological Opinion. Creation and annual updating of a predator management plan will help implement conservative and selective control of nonnative and native predators that pose a threat to threatened and endangered species.	Level 1	Fish and Wildlife Conservation Act Migratory Bird Treaty Act OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73	Ongoing
South J light-footed clapper rail habitat restoration and enhancement	This is a compensatory measure under the Programmatic Biological Opinion. The action involves removal of asphalt road and earthen berms at South J and restoration of spiny rush habitat for the clapper rail.	Level 1	Endangered Species Act Fish and Wildlife Conservation Act Migratory Bird Treaty Act OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73	2003

Table 2-1 Implementation Summary for INRMP Projects (Continued)

Action ¹	Purpose	Priority ²	Requirement	Fiscal Year Goal
<i>Threatened and Endangered Species Projects (continued)</i>				
Remove or relocate utilities underground within endangered species habitat	This is a compensatory measure under the Programmatic Biological Opinion. This action would protect species from flying into utility lines and would also guard species on the ground from predation by preventing the use of above ground lines and poles as perches.	Level 1	Endangered Species Act Fish and Wildlife Conservation Act Migratory Bird Treaty Act OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73	2004
Establish salt marsh bird's-beak populations in central basin and on the eastern arm of Mugu Lagoon	Historical populations of the salt marsh bird's-beak extended into the central basin of the Mugu Lagoon. The USFWS hopes to establish new populations in the central basin and on the eastern arm to enhance the survival of the species and rate of progress toward delisting.	Level 1	Endangered Species Act Fish and Wildlife Conservation Act OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73	2004
Prepare and implement a Jet Assisted Take-off (JATO) Bottle Removal Plan	This is a compensatory measure under the Programmatic Biological Opinion. This action involves removal of JATO bottles from wetland areas and requires a plan to establish the proper procedures (timing, methods) to protect listed species in the areas.	Level 1	Endangered Species Act Fish and Wildlife Conservation Act OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73	2001 (ongoing)

Table 2-1 Implementation Summary for INRMP Projects (Continued)

Action ¹	Purpose	Priority ²	Requirement	Fiscal Year Goal
<i>Threatened and Endangered Species Projects (continued)</i>				
Eastern arm snowy plover habitat restoration	The habitat on the eastern arm has deteriorated as a result of the increase in growth and debris from giant reed and the decreased deposition of sediment. Cleaning up the debris and replenishing sand will restore prime nesting habitat for the western snowy plover.	Level 2	Fish and Wildlife Conservation Act Migratory Bird Treaty Act OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73	2004
<i>Wetland Restoration Projects</i>				
Oxidation Pond Restoration Site (Proposed Mitigation Bank)	This sludge remediation project will continue to be monitored. Study plots are functioning well and decisions about restoration of the tidal creek will be made when the study is complete.	Level 1	Clean Water Act River and Harbor Act USACE Regulatory Guidance (RGL) Letter 94-01 RGL 01-1 EO 11990 EO 11988	2001 (ongoing)
LAG4 (Proposed Mitigation Bank)	This project, at the site formerly known as known as Installation Restoration Program (IRP) Site 4, will continue to be monitored as a nest island. Vegetation control should be implemented to maintain the function of the site as nesting habitat for terns and skimmers. In addition, wetland restoration must remain in perpetuity (USACE 2001).	Level 1	Clean Water Act River and Harbor Act RGL Letter 94-01 RGL 01-1 EO 11990 EO 11988	2001 (ongoing)
South J wetland restoration site monitoring	The project will continue to be monitored for function and value. This area is a completed wetland restoration site. Wetland restoration must remain in perpetuity (USACE 2001).	Level 1	Clean Water Act River and Harbor Act RGL Letter 94-01 RGL 01-1 EO 11990 EO 11988	2001 (ongoing)

Table 2-1 Implementation Summary for INRMP Projects (Continued)

Action ¹	Purpose	Priority ²	Requirement	Fiscal Year Goal
<i>Wetland Restoration Projects (continued)</i>				
L1 wetland restoration site monitoring	The project will continue to be monitored for function and value. Wetland restoration is completed. Wetland restoration must remain in perpetuity as determined by USACE permit conditions (USACE 2001).	Level 1	Clean Water Act River and Harbor Act USACE Regulatory Guidance (RGL) Letter 94-01 RGL 01-1 EO 11990 EO 11988	2001 (ongoing)
L2 wetland restoration site monitoring	Restoration of L2 will be completed and the project will be monitored for function and value. Wetland restoration must remain in perpetuity as determined by USACE permit conditions (USACE 2001).	Level 1	Clean Water Act River and Harbor Act USACE Regulatory Guidance (RGL) Letter 94-01 RGL 01-1 EO 11990 EO 11988	2002 (ongoing)
31 st Naval Construction Regiment (NCR) Small Arms Range wetland restoration site monitoring	The project will continue to be monitored for function and value. Wetland restoration is completed. Wetland restoration must remain in perpetuity as determined by USACE permit conditions (USACE 2001).	Level 1	Clean Water Act River and Harbor Act USACE Regulatory Guidance (RGL) Letter 94-01 RGL 01-1 EO 11990 EO 11988	2001 (ongoing)
Las Posas Restoration Site (Proposed Mitigation Bank)	Los Posas Road Wetland Restoration Mitigation Bank project is a planned restoration of tidal wetlands at the former lagoon landfill, known as IRP Site 1.	Level 2	Clean Water Act River and Harbor Act USACE Regulatory Guidance (RGL) Letter 94-01 RGL 01-1 EO 11990 EO 11988	2005

Table 2-1 Implementation Summary for INRMP Projects (Continued)

Action ¹	Purpose	Priority ²	Requirement	Fiscal Year Goal
<i>Fish and Wildlife Management Projects</i>				
Conduct coyote studies	This activity would investigate the ecological role of coyotes at NBVC Point Mugu and would evaluate the potential ecological effects of a coyote control as a part of the predator management program under the Programmatic Biological Opinion.	Level 1	Endangered Species Act Fish and Wildlife Conservation Act OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73	2002
Study the submerged aquatic habitat and delineate Essential Fish Habitat	NBVC Point Mugu lacks adequate data on essential fish habitat. Studies need to be conducted to identify characteristics of the submerged aquatic environment. Specific investigations should focus on the status and potential restoration of eelgrass beds.	Level 1	Magnuson-Stevens Fishery Management and Conservation Act Fish and Wildlife Conservation Act OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73	2004
Conduct fisheries surveys	NBVC Point Mugu lacks adequate data on populations of fish in Mugu Lagoon. Studies are needed to eliminate the data gap and enable efficient and effective management of the fish.	Level 1	Magnuson-Stevens Fishery Management and Conservation Act Fish and Wildlife Conservation Act OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73	2004

Table 2-1 Implementation Summary for INRMP Projects (Continued)

Action ¹	Purpose	Priority ²	Requirement	Fiscal Year Goal
<i>Fish and Wildlife Management Projects (continued)</i>				
Prepare and implement a Bat Management Plan	There is limited information on bats and surveys are needed to properly manage them. A management plan will create a systematic means for studying, monitoring, and controlling bat populations and offers a way to educate Base residents and workers on bats.	Level 2	Fish and Wildlife Conservation Act Fish and Wildlife Coordination Act OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73	2002
Apply for Western Hemispheric Shorebird Reserve Network (WHSRN) Membership	The Mugu Lagoon is a critical stopover for migratory birds and provides habitat for thousands of shorebirds. Designation as a WHSRN member could provide an avenue for international recognition and funding. WHSRN is part of DoD/PIF.	Level 5	Migratory Bird Treaty Act Fish and Wildlife Conservation Act	2002
<i>Soil and Water Management Projects</i>				
Prepare and implement a Soil Conservation Plan/Erosion Control Plan	Navy policy (OPNAVINST 6250.4B) requires land management to control and prevent soil erosion and to preserve natural resources by conducting surveys and implementing soil conservation measures. Creation of a plan will aid in compliance with this requirement.	Level 2	Clean Water Act OPNAVINST 6250.4B	2004
Conduct a tidal influx study	Research is needed to study the hydrology of the Mugu Lagoon and the potential affect of increased tidal influx, particularly on habitat for salt marsh bird's-beak and clapper rails. Evaluations should be based on various flow conditions including removing or cleaning some or all culverts, and should include systematic measurements of physical characteristics such as salinity and water temperature.	Level 5	Coastal Zone Management Act California Coast Act Coastal Barrier Resources Act Clean Water Act	2005

Table 2-1 Implementation Summary for INRMP Projects (Continued)

Action ¹	Purpose	Priority ²	Requirement	Fiscal Year Goal
<i>Soil and Water Management Projects (continued)</i>				
Calleguas Creek Watershed and Ormond Beach Task Force Participation	Participation in the task forces is important for understanding the effects of activities upstream and adjacent to the ecosystem of Mugu Lagoon. Participation also provides an avenue for regional ecosystem management.	Level 5	Clean Water Act EO 11990 EO 11988	2001 (ongoing)
Study of Submarine Canyon	Erosion in the submarine canyon and ultimately breakthrough of the beach barrier would cause direct intrusion of the Pacific Ocean into the Mugu Lagoon. Breakthrough threatens the current conditions of the lagoon and its ecosystem as well as Base operations. Because of the effects of erosion and breakthrough on the dynamics of the Mugu Lagoon and on military operations, studies are needed to examine movement of the canyon.	Level 5	Coastal Zone Management Act California Coast Act Coastal Barrier Resources Act Clean Water Act	2005
<i>General Projects</i>				
Complete the second generation Geographic Information System (GIS) Habitat Type Classification Map	The habitat types on the existing GIS map should be updated and a new map generated at 1:3600 photo scale.	Level 1	Endangered Species Act Fish and Wildlife Conservation Act Migratory Bird Treaty Act Clean Water Act OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73 EO 11990 EO 11988	2003

Table 2-1 Implementation Summary for INRMP Projects (Continued)

Action ¹	Purpose	Priority ²	Requirement	Fiscal Year Goal
<i>General Projects (continued)</i>				
Update and implement the Integrated Pest Management Plan	Pest management can damage natural resources if not carried out properly. The plan would identify expected pests, biological and natural alternatives to chemical controls, and the least toxic pesticides for use around habitat for sensitive species. The plan also would establish timing, conditions, and procedures for pesticide application.	Level 1	Endangered Species Act Federal Insecticide, Fungicide, and Rodenticide Act Federal Noxious Weed Act OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73 EO 13112	2002
Update the Storm Water Pollution Prevention Plan (SWPPP) to include a non-point source pollution studies	This activity would identify management actions for best management practices for specific water resources. The task will be done in cooperation with the water resources manager.	Level 1	Clean Water Act Sikes Act Improvement Act	With SWPPP Update
Update the Bird Air Strike Hazard (BASH) Plan	This activity would assist in managing the BASH issues on the Base and would complete the integration of the BASH Plan with the INRMP.	Level 2	Sikes Act Improvement Act OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73	2003
Establish an experimental Ventura Marsh Milk Vetch population	Recommended action in the Biological Opinion. This action is intended to establish an experimental population not subject to ESA. The project would be managed by USFWS and the California Department of Fish and Game (CDFG).	Level 5	Fish and Wildlife Conservation Act Endangered Species Act	2003

Table 2-1 Implementation Summary for INRMP Projects (Continued)

Action ¹	Purpose	Priority ²	Requirement	Fiscal Year Goal
<i>Bird Aircraft Strike Hazard (BASH) Projects</i>				
Install spike strips on all plastic or metal signage, non-electronic equipment, and electronic equipment within as well as outside the primary surface area of the airfield on buildings, power poles, fences, and vertical gates, as needed.	This activity prevents birds from perching on elevated equipment and reduces the BASH threat by decreasing perching locations for migrating and foraging birds.	Level 2	OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73	2002
Install whirlybirds on all tall structures and stainless wire on approach light pier.	This activity prevents birds from perching on elevated equipment and reduces the BASH threat by decreasing perching locations for migrating and foraging birds.	Level 2	OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73	2002
Install Bird Barrier™ products (StealthNet, Bird-Flite, Bird-Coil, Bird-Shock, Birdwire, or Daddi Long Legs) on all tall structures, including buildings, poles, fencing, as needed.	These devices are non-lethal methods for deterring birds from landing on structures. These devices reduce the BASH threat by decreasing perching locations for migrating and foraging birds.	Level 2	OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73	2002
Conduct a Hazard Risk Assessment.	This assessment is a study of bird hazards and the relationship between bird habits and aircraft operations. The risk assessment methods should include researching all variables that define the hazard, including natural resources (birds, habitat) and aircraft operations.	Level 2	OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73	2002
Implement BIRD RAD.	Data on the presence of birds in airspace and migratory patterns of diurnal and nocturnal birds increases the ability of air operations to detect and avoid BASH incidents.	Level 2	OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73	2002
Modify grounds maintenance contract to include mowing to maintain infields and approach zones at 7 inches to 14 inches on a monthly basis.	Birds are less likely to feed or nest in grass that has been mowed between 7 and 14 inches, thereby reducing the BASH hazard without negative impacts to natural resources.	Level 2	OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73	2002

Table 2-1 Implementation Summary for INRMP Projects (Continued)

Action ¹	Purpose	Priority ²	Requirement	Fiscal Year Goal
<i>Bird Aircraft Strike Hazard (BASH) Projects (continued)</i>				
Cutting and scraping shrubs within a 150-foot buffer zone per P-80 manual.	This activity could reduce bird habitat adjacent to the runway. The work should include proper erosion control if necessary.	Level 2	OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73	2002
Pave remainder of shoulder along Runway 3.	Paving will prevent killdeer from nesting next to the runway, potentially reducing BASH, without harming natural resources.	Level 2	OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73	2003
Alter flight times to include down time 30 minutes before and after sunset.	Altering flight hours will reduce BASH by minimizing the hazards from birds as they move to roosting sites, particularly larger birds during sundown (such as the great egrets). (Note that sunset changes throughout the year).	Level 2	OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73	2002
Tree reduction (elimination or continual severe pruning of trees).	Reduction in the number of trees around the base (not including riparian stands) could reduce the perching and roosting grounds for larger birds, especially raptors, vultures, and egrets. Curtailing the addition of tall trees to new developments would also reduce the availability of predator perches.	Level 2	OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73	2002
Dry farming at the clear zone to approach at Runway 21 or alternatively paving with concrete.	This action provides an alternative to grass to prevent nesting and foraging of birds, particularly larger birds, in grass areas.	Level 2	OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73	2005
Satellite telemetry for waterfowl movement	This activity increases the understanding of the migration habits of waterfowl, thereby allowing the Navy to adjust air operations to reduce BASH incidents.	Level 2	OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73	2005

Table 2-1 Implementation Summary for INRMP Projects (Continued)

Action ¹	Purpose	Priority ²	Requirement	Fiscal Year Goal
<i>Outdoor Recreation Projects</i>				
<i>General</i>				
Complete negotiations for replacement of the tripartite agreement among the Department of the Navy, the National Park Service, and the State of California by approval of the INRMP	This action would provide the Navy with professional and technical information necessary to coordinate actions that involve outdoor recreation.	Level 2	Sikes Act Improvement Act Fish and Wildlife Conservation Act NAVFACINST MO-100.4 OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73	2002
Create a natural resources orientation program for new personnel at NBVC Point Mugu	This action would foster greater appreciation of natural resources among personnel and reduce demands on natural resources staff to provide information about Base resources.	Level 5	Sikes Act Improvement Act Fish and Wildlife Conservation Act NAVFACINST MO-100.4 OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73	2004
Increase coordination between SOWESTDIV NAVFACENGCOM and NBVC Point Mugu Natural Resources staff and Morale, Welfare, and Recreation (MWR) staff to expand and maintain recreational opportunities	This action is intended to expand leisure opportunities for staff.	Level 5	Sikes Act Improvement Act NAVFACINST MO-100.4 OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73	Ongoing

Table 2-1 Implementation Summary for INRMP Projects (Continued)

Action ¹	Purpose	Priority ²	Requirement	Fiscal Year Goal
<i>Concentrated Outdoor Recreation Activities and Areas-NBVC Point Mugu</i>				
Relocate the campground near the beach area and lagoon farther west, upgrade existing nature trail, install interpretive signs focusing on wildlife and geology, establish a capacity cap and fees for camp sites	This action would protect sensitive species; increase recreation enjoyment, and understanding by visitors and personnel of the natural resources at this site.	Level 5	Sikes Act Improvement Act Fish and Wildlife Conservation Act NAVFACINST MO-100.4 OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73 Public Law 97-258	2002
Construct signs outlining fishing regulations, catch limits, general safety information	This action would assist in enforcing state fishing regulations.	Level 5	Sikes Act Improvement Act Fish and Wildlife Conservation Act NAVFACINST MO-100.4 OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73 10 USC 2671	2004

Table 2-1 Implementation Summary for INRMP Projects (Continued)

Action ¹	Purpose	Priority ²	Requirement	Fiscal Year Goal
<i>Dispersed Outdoor Recreation Areas and Activities -NBVC Point Mugu</i>				
Add stops to the hunting blinds along the runways to prevent hunters from firing towards the runways	This action would reduce safety hazards from firing toward the runway.	Level 2	Sikes Act Improvement Act NAVFACINST MO-100.4 OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73 10 USC 2671	2003
Evaluate an increase of the hunting fees to be equivalent to CDFG public hunting rates and USFWS refuge fees of \$15/day	This action would provide funding to administer the hunting program and manage natural resources that are affected by the activity.	Level 2	Anti Deficiency Act Sikes Act Improvement Act NAVFACINST MO-100.4 OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73 Public Law 97-258	2005
<i>Special Interest Outdoor Recreation Areas and Activities - NBVC Point Mugu</i>				
Construct a Mugu Lagoon Visitor Education Center about wildlife and geology at the auto pullout on State Highway 1. Facilities would be expanded to include a staffed interpretive center and boardwalk	This action would be undertaken through cooperative efforts with National Park Service, Santa Monica Mountains National Recreation Area, CalTrans, and local agencies to expand the public's enjoyment and understanding of the Base's natural resources.	Level 2	16 USC 460 Sikes Act Improvement Act Fish and Wildlife Conservation Act NAVFACINST MO-100.4 OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73	2004

¹ Proposed projects that are determined to have potential significant impacts on the military mission or on natural resources will undergo further environmental review before they are implemented.

² Refer to Appendix A for a description of the priority system.

SECTION 3.0: ALTERNATIVES TO THE PROPOSED ACTION

Alternatives represent the various ways the Navy can fulfill the purpose and need that would be achieved by initiating the proposed action. This section describes all reasonable alternatives to the proposed action that were considered for further evaluation and explains reasons alternatives were rejected. It also describes the no action alternative.

3.1 DEVELOPMENT OF ALTERNATIVES

The CEQ requires an evaluation of reasonable alternatives to the proposed action that would fulfill the purpose of and need for the proposed action. Reasonable alternatives must be practical or feasible from a technical and economic standpoint, support the purpose of and need for the proposed action, and be ready for decision.

3.1.1 Selection Criteria

Criteria used to consider an alternative for analysis were based on regulatory requirements, the mission of the installation, agreements with cooperating agencies, and budget constraints. Selection criteria are listed below.

3.1.1.1 Regulatory Requirements

Alternatives selected for analysis must comply with the following federal, state, and local requirements:

- The 1997 Sikes Act Improvement Act
- The *Guidelines for Providing Integrated Natural Resources Management Plans for Navy Installations*, September 1998
- The Endangered Species Act of 1973, as amended, which includes the following:
 - The USFWS Programmatic Biological Opinion for ongoing activities at NBVC Point Mugu, which establishes requirements for compliance with the ESA regarding incidental take of threatened or endangered species that are a result of routine operations and maintenance associated with the mission of the installation (USFWS 2001b); and
 - Endangered and Threatened Wildlife and Plants, Title 17 Code of Federal Regulations (CFR)

- The Marine Mammal Protection Act of 1972, including Regulations Concerning Marine Mammals, 50 CFR 10, 18, 216, 228
- Clean Water Act of 1972
- Migratory Bird Treaty Act of 1918
- Coastal Zone Management Act of 1972
- California Coastal Act of 1976
- Coastal Barrier Resources Act of 1982
- Federal Insecticide, Fungicide, and Rodenticide Act
- Federal Noxious Weed Act of 1974
- National Invasive Species Act of 1996
- Fish and Wildlife Conservation Act
- DODINST 4715.3 Environmental Conservation Program (May 3, 1996)
- Executive Order (EO) 11990, Protection of Wetlands (1977)
- EO 11988, Floodplain Management (1977)

3.1.1.2 Agreement with the Mission of the Installation

The mission of the installation encompasses the missions of all tenants at NBVC Point Mugu. The mission of most tenants involves aircraft. As a result, their effects on and from natural resources are directly related to air operations. The missions of aircraft-related tenants typically support the Navy in fleet operations and exercises, provide support in test and evaluation, and “maintain combat readiness for rapid mobilization to support national defense requirements” (Benchmark Publications 2000). Table 3-1 summarizes the activities of the other tenant commands and presents the missions adopted by these divisions as well as by NBVC Point Mugu (U.S. Navy 2002). An expanded description of the missions of NBVC Point Mugu mission and tenants is provided in Section 1.2.2 of the proposed INRMP (U.S. Navy 2002).

Table 3-1 NBVC Point Mugu Tenant Commands

Tenant Name	Mission/Activities
COMAEWWINGPAC DET Aircraft Intermediate Maintenance Department (AIMD)	• Maintenance of aircraft
Air Test and Evaluation Squadron Nine (VX-9 DET)	• Air operations • Operational test and evaluation of weapons systems, support equipment, and materials • Development of techniques, tactics, and procedures for use of aircraft, weapons, and support systems
Commander Airborne Early Warning Wing U.S. Pacific Fleet (COMAEWWINGPAC)	• Airborne Early Warning Wing (E-2C) aircraft operations
Carrier Airborne Early Warning Squadron (VAW-112)	• Weapons system management
VAW-113	• Battle space management
VAW-116	• Field carrier landing practices (FCLPs)
VAW-117	• Search and rescue operations • Electronic support • Communication and data link relay
31 st NCR Small Arms Fire Range	• Firing qualifications
Explosive Ordinance Disposal (EOD) Detachment	• Identification, location, rendering safe, and disposal of hazardous explosive items • Sea Test Range support • Emergency EOD support for flight operations • Respond to suspected package and briefcase bombs • Diving and special operation insertion and extraction capabilities using helicopters
Federal Bureau of Investigation (FBI)	• NA
Fleet Maritime Patrol, Mobile Operations Control Center East Pacific (FMP MOCC EPAC)	• Deployable command, control, communication, computer, intelligence, surveillance and reconnaissance (C4ISR) system • Support fleet and joint operations • Support SEALs and amphibious forces
Fleet Logistics Support Squadron 55 (VR-55)	• NAVAIRES Force squadron • C-130T Air operations • Transportation of passengers and cargo

Table 3-1 NBVC Point Mugu Tenant Commands (continued)

Tenant Name	Mission/Activities
Naval Air Reserve (NAVAIRES)	• Air operations (NAVAIRES Force squadrons) • Training and personnel service for Naval Reservists
Naval Air Warfare Center Weapons Division (NAWCWD)	• Missile operations • Air operations (including touch-and-goes) • Research, Development, Test and Evaluation (RDT&E), and support for weapons and aircraft weapons systems • Fleet operations support and training
Naval Pacific Meteorology & Oceanography Detachment	• Meteorological radar and satellite systems
Naval Satellite Operations Center (NAVSOC)	• Laguna Peak operation of spacecraft • Operation, management, and maintenance of assigned satellite systems • Provide reliable satellite services to war-fighter in support of naval and national requirements
Naval Test Wing Pacific, Naval Weapons Test Squadron (NWTs)	• Provides aircraft operations and RDT&E support for weapons and weapons systems to the Naval Aviation Systems Team and fleet training services
Patrol Squadron Sixty Five (VP-65)	• P-3C air operations (long range maritime patrol aircraft) • Undersea warfare • Anti-surface warfare • Surface surveillance • Intelligence collection • Aerial photography • Counter-narcotics operation

The mission of NBVC Point Mugu is to provide “worldclass aviation support to a diverse group of tenant commands with various aircraft test platforms and airframes homeported at Point Mugu and support of Department of Defense and transient aviation organizations” (Benchmark Publications 2000).

The goals of the base that reflect this core purpose are:

- To support the military needs in the primary mission to provide full-service weapons testing and evaluation for the Navy and the DoD.
- To support the military needs for air operations and provide full-service fleet support.
- To be an outstanding host to tenant commands so that they will be able to accomplish their missions.
- To maintain a high quality of life and satisfaction within the NBVC Point Mugu community.

3.1.1.3 Agreement With Cooperating Agencies

Alternatives selected for further analysis must reflect the mutual agreement of USFWS, NMFS, and CDFG (as stakeholders) with the U.S. Navy on conservation, protection, and management of fish and wildlife resources at NBVC Point Mugu.

- USFWS is the primary federal agency responsible for management of fish and wildlife, and is the regulatory authority for the ESA and the Migratory Bird Treaty Act (MBTA) (16 U.S. Code [USC] 703-711). Concurrence by USFWS (California-Nevada office) on this INRMP would constitute the signatory agreement and would apply only to USFWS and NBVC Point Mugu.
- NMFS holds regulatory authority over actions that involve marine mammals, essential fish habitat, and ocean and estuarine fisheries. Because protected species (the harbor seal) and breeding habitat (halibut nurseries) are present at NBVC Point Mugu, NMFS would be included as a signatory agency to the INRMP.
- CDFG is the primary management agency for wildlife and freshwater fish in the State of California. CDFG is also a consulting agency under the U.S. Fish and Wildlife Coordination Act and would be included as a stakeholder signatory agency to the INRMP. However, legal mandate does not require protection of State/territory listed rare and endangered species at NBVC Point Mugu (OPNAVINST 5090.1B CH-2, Section 22-5.2).

Alternatives selected must also comply with plans that include the area within NBVC Point Mugu that are implemented by the following agencies:

- USACE is responsible for regulation of jurisdictional wetlands and provides oversight for wetland restoration as mitigation and as a mitigation bank. The Regulatory Branch of the Los Angeles District USACE reviews and issues permits for activities at NBVC Point Mugu that may affect jurisdictional wetlands.
- RWQCB regulates water quality. RWQCB is responsible for enforcement of Section 401 CWA and reviews Section 404 CWA water quality qualifications. This agency plays a role at NBVC Point Mugu in controlling indirect and direct impacts to water quality throughout the installation.

3.1.1.4 Budget Constraints

Alternatives selected for analysis must include only those projects and activities that meet Navy-funding priorities as established by the Commander Navy Region Southwest (CNRSW), CINCPACFLT and the Chief of Naval Operations (CNO).

3.1.1.5 Conformity With Installation Land Use Management Plans

Alternatives selected for analysis must comply with the land use classifications in the NBVC Point Mugu Master Land Use Plan for planning future projects.

3.1.2 Alternatives Considered but Eliminated from Study

Alternatives considered but eliminated from detailed study are identified in this section.

3.1.2.1 Implementation of an INRMP that would increase consumptive recreational activities such as waterfowl hunting at NBVC Point Mugu

This alternative was eliminated from further study because it did not meet the following selection criteria: agreement with the mission of the installation and compliance with existing regulatory requirements. This alternative would impair the military in its mission to maintain combat readiness for rapid mobilization to support national defense requirements and would likely result in noncompliance with the USFWS BO through increased risk of an endangered species taking.

3.1.2.2 Implementation of an INRMP that would preserve the entire base as a wildlife refuge

This alternative was eliminated from further study because it would not meet the selection criterion of agreement with the installation mission. This alternative would impair the military in its mission to maintain combat readiness for rapid mobilization to support national defense.

3.1.2.3 Implementation of an INRMP that would fully execute all projects described in the Proposed Action

This alternative was not selected for further analysis because it did not meet the selection criterion for budget constraints.

3.2 ALTERNATIVES TO THE PROPOSED ACTION

There are no reasonable alternatives to the proposed action other than the no action alternative.

3.3 NO ACTION ALTERNATIVE

The no action alternative would forego implementation of the proposed INRMP. Under this alternative, NBVC Point Mugu would continue to implement the USFWS BO and comply with existing natural resources management requirements. The natural resource management constraints described in Section 2.3.1 would continue to be in effect under the no action alternative, yet not as a formalized program. Use of the natural resource constraints map (Figure 2-1) may or may not take place and would not be updated on a regular basis as it would under the proposed action. Wetland restoration activities described in Section 4.6.2 and shown on Figure 2-2 would continue to take place under the no action alternative. In addition to the BO, other agencies and programs that would provide natural resources management and influence the direction of projects at NBVC Point Mugu under the no action alternative are described below.

3.3.1 Federal Agencies with Jurisdiction over Natural Resources Management at NBVC Point Mugu

Under the no action alternative, a number of federal agencies have an interest or a role in managing natural resources at NBVC Point Mugu. The involvement of these agencies is based on cooperative agreements, regulatory authority, and technical assistance as required by

federal laws and regulations. USFWS is the primary federal agency responsible for management of fish and wildlife and is the regulatory authority for the ESA and the MBTA (16 USC 703-711). Guidance and field assistance for management of fisheries and marine mammals also are available from NMFS. NMFS holds regulatory authority over actions that involve marine mammals and ocean fisheries. NBVC Point Mugu supports unique resources for marine mammals, including a large known pupping and haulout area (year round) for harbor seals, as well as use of the coastal strand sandy beaches by a few sea lions and elephant seals.

3.3.2 State Agencies with Jurisdiction over Natural Resource Management at NBVC Point Mugu

CDFG has an interest in management of natural resources at NBVC Point Mugu in terms of conservation, protection, and management of fish and wildlife resources. However, while the Navy shall use its authority to enhance the recovery of Federally-listed endangered and threatened species and their habitat, legal mandate does not require protection of State/territory listed rare and endangered species under OPNAVINST 5090.1B Ch-2, Section 22-5.2. Under the no-action alternative, the cooperative agreement with CDFG and the Navy formalized in the INRMP would not take place. CDFG is also a consulting agency under the U.S. Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 USC 661 and following).

Another state agency that has a role in resource management at NBVC Point Mugu is the RWQCB. RWQCB regulates water quality and is responsible for enforcement of Section 401 of CWA and reviews Section 404 CWA water quality qualifications. This agency plays a role at NBVC Point Mugu in controlling indirect and direct impacts to water quality throughout the installation. The majority of communication with this agency occurs under the storm water program.

3.3.3 Nongovernmental Conservation Organizations

Under the no action alternative, NBVC Point Mugu would continue to coordinate with nongovernmental conservation organizations (such as the Calleguas Creek Task Force, the Arundo Task Force, and species-specific working groups) as appropriate to seek technical information and assistance. These organizations do not have a regulatory role at NBVC Point

Mugu and may or may not continue to work cooperatively with the NBVC Point Mugu under the no action alternative.

3.3.4 Comparative Summary of Environmental Impacts

This section presents the environmental impacts of the proposal and no action alternative in comparative form as provided in Table 3-2.

Table 3-2

COMPARATIVE SUMMARY OF ADVERSE ENVIRONMENTAL IMPACTS		
Resource Area	Proposed Action	No Action Alternative
Land Use	Changes in the location, outdoor opportunities, and management of the campground would result in a minor adverse impact to recreational land use by assessing fees.	No impact from camping fees.
Air Quality	No Impact	No Impact
Noise	No Impact	No Impact
Geology and Soils	No Impact	No Impact
Hydrologic	No Impact	No Impact
Special Aquatic Sites	No Impact	No Impact
Biological Resources	No Impact	No Impact
Special Status Listed Species	No Impact	No Impact
Cultural Resources	No Impact	No Impact
Protection of Children	No Impact	No Impact
Environmental Justice	No Impact	No Impact
Hazardous Materials	No Impact	No Impact
COMPARATIVE SUMMARY OF BENEFICIAL ENVIRONMENTAL IMPACTS		
Resource Area	Proposed Action	No Action Alternative
Land Use	Further the military mission at NBVC Point Mugu by increasing the numbers and health of listed species populations. This would allow the Navy to continue military activities without jeopardizing the health of a species population. Enhancing the Navy's ability to further its military mission would be a beneficial impact to land use.	Implementation of the BO would also improve the health of species populations.
	Expansion and maintenance of recreational facilities at NBVC Point Mugu would benefit recreational land use for local military and civilian personnel.	No impact
	Changes in the location, outdoor opportunities, and management of the campground would result in minor beneficial impacts to recreational land use.	No impact
	Placement of signage that outlines fishing regulations, catch limits, and general safety information to assist the state in enforcing fishing regulations would result in a beneficial impact to recreational land use.	No impact

COMPARATIVE SUMMARY OF BENEFICIAL ENVIRONMENTAL IMPACTS		
Resource Area	Proposed Action	No Action Alternative
Land Use (cont)	Adding stops to the hunting blinds along the runways to prevent hunters from firing toward the runways would have a beneficial impact to operation safety.	No impact
	Construction of an interpretation center at Mugu Lagoon by the National Park Service would have a beneficial impact to recreational land use at property adjacent to NBVC Point Mugu and would expand the public's enjoyment and understanding of the installation's natural resources	Construction of an interpretation center at Mugu Lagoon by the National Park Service would have a beneficial impact to recreational land use at property adjacent to NBVC Point Mugu and would expand the public's enjoyment and understanding of the installation's natural resources
Air Quality	No Impact	No Impact
Noise	Potential for decrease in noise at ground level due to increased number of take-off and landings at steeper angles to ground.	No Impact
Geology and Soils	Potential for decrease in soil erosion due to increased participation in basin-wide watershed management plans and implementation of non-point source pollution prevention BMPs.	The existing installation-wide storm water pollution prevention plan addresses on-base erosion control.
Hydrologic	Tidal influx could result in beneficial impacts by enhancing the understanding of means to manage tidal influx to improve habitat and reduce flood hazard.	No plan is currently in place to ensure the development of a tidal influx study
	Participation in the Calleguas Creek Watershed Task Force would likely result in improved water quality in Calleguas Creek through improved quality of agricultural return flows and reduced sedimentation	No plan is currently in place to ensure increased participation with other watershed users
	Updating the Integrated Pest Management Plan would likely result in a decrease of toxic chemicals in surface water at NBVC Point Mugu.	The existing Integrated Pest Management Plan would be updated
	Non-point source pollution prevention plan identifying best management practices for activities at NBVC Point Mugu that accelerate erosion, would reduce sediment load to surface water.	The existing installation-wide storm water pollution prevention plan addresses on-base erosion control.
Special Aquatic Sites	Seven wetland restoration projects described in Section 4.6.2 would result in repair or enhancement of 9 acres of jurisdictional wetlands.	All seven wetland restoration projects would take place.
	Participation in the Calleguas Creek Watershed Task Force would enable NBVC Point Mugu Natural Resources Management personnel to participate in regional ecosystem management that is likely to result in improved water quality in wetlands.	No plan for participation
	An updated Integrated Pest Management Plan would likely result in a decrease of toxic chemicals contributed to wetlands by the use of pesticides.	The Pest Management Plan is likely to be updated
	A non-point source pollution prevention plan. The plan would identify best management practices for activities at NBVC Point Mugu that accelerate erosion, thus reducing sediment load to wetlands areas.	Non-point source pollution prevention plan is not planned.

COMPARATIVE SUMMARY OF BENEFICIAL ENVIRONMENTAL IMPACTS		
Resource Area	Proposed Action	No Action Alternative
Biological Resources	The eradication of nonnative plants (giant reed and iceplant, for example) would benefit vegetation resources at NBVC Point Mugu by eliminating plants that compete with native plants for space and survival.	The eradication of nonnative plant species is planned.
	The preparation and implementation of a Jet Assisted Take-off (JATO) Bottle Removal Plan would remove JATO bottles from wetland areas and result in a beneficial impact to wetland habitat at NBVC Point Mugu.	The preparation and implementation of a Jet Assisted Take-off (JATO) Bottle Removal Plan would remove JATO bottles from wetland areas would take place.
	Seven special aquatic site wetland restoration projects (Section 4.6.2) would improve wetland function and value and provide a beneficial impact to wetland habitat at NBVC Point Mugu.	Seven special aquatic site wetland restoration projects would continue
	Study of submerged aquatic habitat and essential fish habitat would identify characteristics of the submerged aquatic environment. This activity would provide planning and management baseline information to NBVC Point Mugu and benefit fish resources.	The activities listed below may take place because they would enable NBVC Point Mugu to comply with natural resource requirements. However these activities are not required specifically by laws and regulations. They may or may not occur, or may be conducted at a slower pace or to a lesser extent then under the proposed INRMP.
	Fisheries surveys would provide planning data on populations of fish in Mugu Lagoon that would enable NBVC Point Mugu to develop effective management of the fish. This would result in a beneficial impact to fish resources.	A submerged aquatic habitat and essential fish habitat study
	The preparation and implementation of a Bat Management Plan would create a systematic means for studying, monitoring, and controlling bat populations and offers a way to educate Base residents and workers on bats. This would be a beneficial impact to wildlife.	Fisheries surveys
	Designation as a WHSRN member could provide an avenue for international recognition and funding. Increased funding would be a beneficial impact to bird resources.	Preparation and implementation of a Bat Management Plan
	The preparation and implementation of a Soil Conservation Plan/Erosion Control Plan would help to preserve natural resources by conducting surveys and implementing soil conservation measures. This would likely result in a beneficial impact to aquatic habitat sites through decreased sediment load to surface water.	Membership in the Western Hemispheric Shorebird Reserve
	Tidal influx study of the hydrology of the Mugu would benefit lagoon habitat areas by providing NBVC Point Mugu with natural resource planning information.	Preparation and implementation of a Soil Conservation Plan/Erosion Control Plan
	Participation in the Calleguas Creek Watershed and Ormond Beach Task Force would increase the likelihood of improved water quality at NBVC Point Mugu.	- A tidal influx study of the hydrology of the Mugu Lagoon - Participation in the Calleguas Creek Watershed and Ormond Beach Task Force - A study of the submarine canyon

COMPARATIVE SUMMARY OF BENEFICIAL ENVIRONMENTAL IMPACTS		
Resource Area	Proposed Action	No Action Alternative
Biological Resources (cont.)	Study of the submarine canyon would provide NBVC Point Mugu with information regarding the timing and nature of erosion in the submarine canyon and ultimate breakthrough of the beach barrier. Because migration of the canyon could cause direct intrusion of the Pacific Ocean into the Mugu Lagoon, an understanding of the processes at work and potential mitigation measures would benefit habitat resources at NBVC Point Mugu.	Completion of a second generation Geographic Information System (GIS) Habitat Type Classification Map
	Completion of a second generation Geographic Information System (GIS) Habitat Type Classification Map would provide natural resource planners at Mugu Lagoon with updated habitat information at a scale that provides more detail. This would benefit habitat resources at NBVC Point Mugu by assisting in planning efforts.	Updating and implementing the Integrated Pest Management
	Updating and implementing the Integrated Pest Management Plan would benefit vegetation and wildlife resources by reducing the amount of toxic pesticides introduced to habitat areas.	Updating the Storm Water Pollution Prevention Plan to include identification of non-point source pollution
	Updating the Storm Water Pollution Prevention Plan to include identification of non-point source pollution at NBVC Point Mugu would benefit aquatic habitat resources by reducing sediment and chemical loading in surface water.	Update the Bird Air Strike Hazard (BASH) Plan
	Update the Bird Air Strike Hazard (BASH) Plan and integrate the Plan with the INRMP. Developing procedures to reduce the number of bird air strikes would be a beneficial impact to bird resources.	Establishing an experimental Ventura Marsh Milk Vetch population
	Establishing an experimental Ventura Marsh Milk Vetch population would increase the population of, and benefit non-ESA vegetation resources at NBVC Point Mugu.	The installation of bird-deterrence devices near airfields
	The installation of spike strips on all plastic or metal signage, and equipment within and outside the primary surface area of the airfield on buildings, power poles, fences, and vertical gates would prevent birds from perching on elevated equipment. This decrease in perching locations for migrating and foraging birds would benefit bird resources by reducing the BASH hazard.	Conducting a Hazard Risk Assessment to study bird hazards
	The installation of bird-deterrence devices near airfields would also benefit bird resources by reducing the BASH hazard. Proposed devices include: whirlybirds on all tall structures and stainless wire on approach light pier, Bird Barrier™ products (StealthNet, Bird-Flite, Bird-Coil, Bird-Shock, Birdwire, or Daddi Long Legs) on all tall structures, including buildings, poles, fencing, as needed.	Implementation of BIRD RAD
		Modification of the grounds maintenance contract to include mowing to maintain infields and approach zones at 7 inches to 14 inches
		Use of satellite telemetry for waterfowl movement
		The creation of a natural resources orientation program for new personnel at NBVC Point Mugu
		Relocating the campground near the beach area and lagoon farther west and establishing a capacity cap for camp sites

COMPARATIVE SUMMARY OF BENEFICIAL ENVIRONMENTAL IMPACTS		
Resource Area	Proposed Action	No Action Alternative
Biological Resources (cont.)	Conducting a Hazard Risk Assessment to study bird hazards and the relationship between bird habits and aircraft operations would reduce the BASH hazard and beneficially impact bird resources	See Previous Page
	Implementation of BIRD RAD to collect data on the presence of birds in airspace and migratory patterns of diurnal and nocturnal birds would increase the ability of air operations to detect and avoid BASH incidents and beneficially impact bird resources.	
	Modification of the grounds maintenance contract to include mowing to maintain infields and approach zones at 7 inches to 14 inches on a monthly basis, cutting and scraping shrubs within a 150-foot buffer zone, altering flight times to include down time 30 minutes before and after sunset, and reducing the presence of tree perches would reduce the BASH hazard resulting in a beneficial impact to bird resources.	
	Proposed use of satellite telemetry for waterfowl movement would increase the understanding of the migration habits of waterfowl, thereby allowing the Navy to adjust air operations to reduce BASH incidents. This would result in a beneficial impact to bird resources.	
	The creation of a natural resources orientation program for new personnel at NBVC Point Mugu would foster greater appreciation of natural resources among personnel and reduce demands on natural resources staff to provide information about Base resources. This would benefit biological resources at NBVC Point Mugu by decreasing risk of inappropriate human encounters with vegetation and wildlife and increasing the time the natural resources staff have to further habitat protection and enhancement.	
	Relocating the campground near the beach area and lagoon farther west and establishing a capacity cap for campsites would benefit biological resources by providing more protection to natural resources at NBVC Point Mugu.	
	The proposed annual population monitoring of special status listed species would be designed to monitor the demographic population status of listed species at NBVC Point Mugu and to ensure compliance with the Endangered Species Act (ESA) and the Programmatic Biological Opinion. This would benefit special status listed species by tracking problem and successful areas for improved management and increased population viability.	Annual population monitoring of special status listed species would take place.

COMPARATIVE SUMMARY OF BENEFICIAL ENVIRONMENTAL IMPACTS		
Resource Area	Proposed Action	No Action Alternative
Special Status Listed Species	The installation of signs and fencing to restrict access to areas occupied by listed species would restrict access to areas occupied by listed species and fitted appropriately to discourage perching by predatory birds. These activities would benefit special status listed species by reducing harmful human and predatory bird encounters.	Installation of signs and fencing to restrict access to areas occupied by listed species would take place.
	Implementation of a light-footed clapper rail captive breeding and enhancement program would provide a beneficial impact to bird resources through the recovery of the clapper rail (juvenile and egg translocation).	Implementation of a light-footed clapper rail captive breeding and enhancement program would take place.
	The removal of the Holiday Beach asphalt parking lot for the western revetment seawall repair project would restore sandy areas and benefit special status bird resources by creating additional nesting habitat for the western snowy plover.	Removal of the Holiday Beach asphalt parking lot would take place.
	The proposed Pad Alpha I habitat restoration project would remove all catapult berms in the area and restore the habitat to sandy beach providing a beneficial impact for the western snowy plover.	Pad Alpha I habitat restoration project would take place.
	The proposed Pad Alpha II habitat restoration project would beneficially impact western snowy plover and light-footed clapper rail by restoring habitat. Under Pad Alpha II, all structures would be removed and the area restored to sandy beach and spiny rush habitat.	Pad Alpha II habitat restoration project would take place.
	Implementation of a predator management plan to help implement conservative and selective control of nonnative and native predators that pose a threat to threatened and endangered species. This would beneficially impact special status listed species by reducing risk of loss to predators.	Implementation of a predator management plan would take place.
	Removal or relocation of utilities underground within endangered species habitat would protect and benefit species from flying into utility lines and would also guard species on the ground from predation by preventing the use of above ground lines and poles as perches.	Removal or relocation of utilities underground within endangered species habitat would take place.

COMPARATIVE SUMMARY OF BENEFICIAL ENVIRONMENTAL IMPACTS		
Resource Area	Proposed Action	No Action Alternative
Special Status Listed Species (cont)	Restoration of Eastern Arm snowy plover habitat, by cleaning up the debris and replenishing sand, would benefit plovers by increasing available breeding habitat.	The activities listed below would enable NBVC Point Mugu to comply with the natural resource requirements, however they are not required specifically by laws and regulations. They may or may not occur, or may be conducted at a slower pace or to a lesser extent than under the proposed INRMP. • Restoration of Eastern arm snowy plover habitat • Coyote studies
	Proposed coyote studies to investigate the ecological role of coyotes at NBVC Point Mugu and evaluate the potential ecological effects of a coyote control as a part of the predator management program under the Programmatic Biological Opinion. This would benefit listed species by reducing the risk of loss to predators.	
	Restoration and enhancement of the South J light-footed clapper rail by removal of asphalt road and earthen berms at South J and restoration of spiny rush habitat for the clapper rail. This would benefit special status bird resources	Restoration and enhancement of the South J light-footed clapper rail would take place.
Cultural Resources	Removal of asphalt road at South J would take place.	No Impact
Protection of Children	No Impact	No Impact
Environmental Justice	No Impact	No Impact
Hazardous Materials	No Impact	No Impact

SECTION 4.0: AFFECTED ENVIRONMENT

This section describes the human environment of NBVC Point Mugu. The baseline information provided in this section allows the evaluation of potential environmental impacts that could result from the proposed action and the no action alternative. As stated in 40 CFR §1508.14, the human environment includes natural and physical resources and the relationship of people to those resources. The environmental baseline or resource areas described in this chapter were selected after identifying the potential issues and concerns of the proposed action and the no action alternative listed in Section 1.4.

Only relevant resource areas are described in detail; resource areas that would not be affected are described only briefly in this section. Resource areas that may be affected by the proposed action and the no action alternative include location, land use, air (noise), soil, water, wetlands, biological resources, and socioeconomics.

The location and extent of affected environment study areas depend on the resource evaluated. The study areas for geology, soils, cultural resources, and biological resources, including wetlands and vegetation, are the same as and equal to the physical boundaries of NBVC Point Mugu (Figure 1-1, in pocket). The study areas for general location (climate), land use, socioeconomic, air, water and bird resources extend outside the boundaries of NBVC Point Mugu and are defined at the beginning of each section.

4.1 LOCATION

This section describes the geographic settings, primary activities, general landscape, and general climate of the affected areas.

4.1.1 Geographic Setting

NBVC Point Mugu is located at Point Mugu in Ventura County, California, about 50 miles northwest of Los Angeles (Figure 4-1). NBVC Point Mugu is located in the Oxnard Plain and the Calleguas Creek watershed. The most prominent geomorphic feature of NBVC Point Mugu is the Mugu Lagoon salt marsh estuary that drains the Calleguas Creek into the Pacific Ocean (Figure 1-1, in pocket).

FIGURE 4-1

4.1.2 General Landscape of the Area

NBVC Point Mugu is situated in the Ventura Basin in the southern portion of the Oxnard Plain (Figure 4-2). The Oxnard Plain is generally flat with a slight increase in elevation inland to the north. The Ventura Basin is bounded by the Santa Monica and Santa Ynez Mountains to the east and north. The ground surface at NBVC Point Mugu is relatively flat, with elevations ranging from sea level to about 11 feet above mean sea level.

Geomorphic features at NBVC Point Mugu include open, dry land, some of which is elevated above sea level by fill; areas of ocean beach and dunes; brackish marsh, salt marsh and salt panne; intertidal mudflat and sandflat; sand nest islands; tidal creeks; and transitional wetlands. The Mugu Lagoon consists of two arms, east and west, which project out from a broader central basin (Figure 4-3). The boundaries of Mugu Lagoon vary seasonally and are heavily influenced daily by tides and storms.

4.1.3 General Climatic Conditions

The climate of NBVC Point Mugu is moderately humid with mild, moist winters and warm, dry summers. Data obtained from the Western Regional Climate Center for a 16-year period beginning July 1984 and ending July 2000 indicate that the average annual minimum temperature is 51.0 °F and the average annual maximum temperature is 70.2 °F, with the highest temperatures in August and the lowest temperatures in February (Western Regional Climate Center 2001). Average total monthly precipitation ranges from 0.02 inches in June to 3.36 inches in February, with an average total of annual precipitation of 14.82 inches (Western Regional Climate Center 2001). Approximately 95 percent of the annual precipitation falls from November through April.

Wind speeds and directions near NBVC Point Mugu show seasonal variations. From March through September, westerly to northwesterly onshore winds are dominant from mid-morning through early evening. The onshore summer winds are typically 4 to 10 knots but can be significantly stronger in March, April, and May. From October through February, moderate, northeasterly, offshore winds of 4 to 10 knots are typical during the night and morning. These winds change in the afternoon to somewhat stronger, westerly, onshore winds.

Figure 4-2

Figure 4-3

4.2 LAND USE

The land use study area for NBVC Point Mugu includes the installation and two adjacent facilities: hunting clubs located west of the facility, and a wildlife habitat viewing area located at the eastern boundary (Figure 1-1, in pocket). NBVC Point Mugu has 897 buildings, including 568 family housing units, food service buildings, recreational facilities, administration buildings, maintenance shops, and hangars. Many of the buildings were constructed on dredged material and other fill. The primary land use of NBVC Point Mugu is as a major center for naval weapons systems testing and evaluation. In addition, it provides range, technical, and base support for fleet users and other DoD agencies. Secondary land uses at NBVC Point Mugu include tenant activities, recreation, and natural resource management. These land uses are summarized in this section of the EA.

4.2.1 Military Land Use

NBVC Point Mugu is a National Defense Resource that offers a unique combination of mission capabilities to the U.S. Navy. It is a major shore command for aviation and supports Naval Construction Force operations for the mobilization base at NBVC Port Hueneme. NBVC Point Mugu provides services in aviation, logistics, and Base Operating Support (BOS) for the Naval Construction Force, and supplies aircraft intermediate maintenance services to all military and transitory aircraft in the Ventura County area. The mission of NBVC Point Mugu is to provide “world class aviation support to a diverse group of tenant commands with various aircraft test platforms and airframes homeported at Point Mugu and support of Department of Defense and transient aviation organizations” (Benchmark Publications 2000).

NBVC Point Mugu operates and maintains base facilities that include airfield operations for the U.S. Pacific Fleet units, NAWCWD, tenant commands, and transient units. NBVC Point Mugu therefore is responsible for command oversight of all airfield facilities, air traffic control tower operations, aircraft training (such as carrier deck certification), the BASH program, control, maintenance and storage of weapons and their facilities, and aircraft maintenance facilities. As stated in the base public affairs publication, “the NAS [Naval Air Station] Class C Airfield, Air Traffic Control Facility, weapons storage and handling services, Aviation and Explosive Safety, and Aircraft Intermediate Maintenance Department, provide a base of operations in support of test and evaluation of air and shipboard weapons systems, satellite operations, and employing

U.S. Pacific Fleet units” (Benchmark Publication 2000). A significant mission of NBVC Point Mugu is to support NAWCWD, whose primary mission is developmental testing and evaluation of naval weapons systems. NBVC Point Mugu also supports the Explosive Ordnance Division (EOD) and the Airborne Early Warning Wing (E-2C), which recently made NBVC Point Mugu its homeport facility.

Airfield capabilities at NBVC Point Mugu enable Navy Commands to launch more than 205 missiles and 181 targets and support more than 1,870 range operations critical to air and sea weapons test and evaluation (Benchmark Publications 2000). The base also supports the Navy through troop mobilization, military training, and test and evaluation of land, sea, and air weapons systems. NBVC Point Mugu operates under the command and control of Commander in Chief, U.S. Pacific Fleet.

The goals of the base that reflect the core purpose of NBVC Point Mugu are as follows:

- To support the military needs in the primary mission to provide full-service weapons testing and evaluation for the Navy and the DoD.
- To be an outstanding host to tenant commands so that they will be able to accomplish their missions.
- To maintain a high quality of life and satisfaction within the NBVC Point Mugu community.

The installations’ master plan sets a vision for the base as well as a strategy to attain it; however, it is out of date and should be revised to reflect activities that are more recent and the current military mission of the installation. Efforts have been initiated to update the master plan.

The existing master plan is driven by the following major goals (Pacific Missile Test Center [PMTTC] 1986).

- Establish an organized and functional land use plan to maximize use of Navy property among the station’s departments and tenants that recognizes all natural and man-made constraints.
- Improve the efficiency of mission performance capabilities.
- Identify and correct deficiencies in existing base facilities, and provide recommendations that will solve station-wide problems.
- Promote land use compatibility within the station and in relationship to the surrounding communities.

- Comply with all applicable federal and, insofar as possible, state, and local planning directives that guarantee the public's safety and the protection of environmental resources.

4.2.2 Tenant Land Use

There are more than 40 tenant commands at NBVC Point Mugu, with 12 of the major military commands stationed there. Independent goals and individual mission statements guide the activities of these base tenants. Several of these tenants also play significant roles in management of natural resources on the base, both by their effects on natural resources and by the effects of natural resources on their missions. Table 3-1 summarizes activities of tenant commands and the missions they have adopted as well as by NBVC Point Mugu.

4.2.3 Surrounding Communities

NBVC Point Mugu's closest neighboring communities are Oxnard, Camarillo, Newbury Park, Thousand Oaks, Port Hueneme, and Ventura. NBVC Point Mugu is accessible from State Highway 1 and is about 10 miles south of U.S. Highway 101 and Camarillo. The land surrounding NBVC Point Mugu is used for various agricultural, recreational, and industrial purposes, as illustrated on Figure 4-4. The foothills of the Santa Monica Mountains border NBVC Point Mugu to the east and are designated open lands used for grazing, agriculture, and recreation. Point Mugu State Park occupies 14,000 acres of this area and is located directly east of Laguna Peak. The portion of the state park that is near the base hosts campgrounds and beach facilities. Point Mugu State Park, Mugu Lagoon, and the privately owned foothills are all part of SMMNRA (SMMNRA 2000). The relationship between Navy and NPS land is shown in Figure 4-5.

Immediately northwest of NBVC Point Mugu are two duck clubs: the Point Mugu Duck Club and the Ventura County Game Reserve (Figure 1-1, in pocket). These clubs maintain up to 620 acres of freshwater pond habitat for migratory waterfowl, shorebirds, waders, and other migratory and resident birds. The majority of the remaining area north, northeast, and northwest of the base is composed of wide expanses of agricultural land dotted with small, agriculturally oriented residential and industrial developments. The Pacific Ocean and Ormond Beach lie directly south and west of the site.

Figure 4-4

Figure 4-5

Small nodes of industrial development are located within 5 miles of the northwest boundary of the base. The largest includes the Houston Power Company Ormond Beach electric generating plant, located 1.5 miles northwest of NBVC Point Mugu.

4.2.4 Outdoor Recreational Land Use

Recreational land use at NBVC Point Mugu is generally limited to base personnel, who typically use portions of the installation for fishing, waterfowl hunting, jogging, surfing, camping, walking, and observing wildlife. These land uses are highly localized and use is restricted to approved personnel. NBVC Point Mugu is not open to the public because of security protocols for the military mission. The NBVC Point Mugu police patrol the base and monitor the boundaries of the eastern and western arms of the lagoon to prevent trespassers from entering through the fencelines. Visitors who come to NBVC Point Mugu to take part in natural resource activities are allowed on base only in groups, and only if they have permission from military personnel and have obtained a pass from the base. Once they are on base, all visitors are expected to follow the installation's regulations and observe base area restrictions.

Areas open to base personnel for recreation include Family Beach, the picnic and campground areas, and hunting blinds during the open season. Open and restricted access areas for outdoor recreation are shown on Figure 4-6. Waterfowl hunting and development of wildlife viewing facilities have been identified as issues of concern for this EA and are discussed in detail below.

4.2.4.1 Waterfowl Hunting

The location of land used at NBVC Point Mugu and the adjacent hunting clubs are shown in Figure 1-1 (in pocket). All hunters at NBVC Point Mugu must hold a valid hunting license from CDFG, along with a federal Duck Stamp. Hunters must first pass a written exam administered by the Natural Resources Office, Waterfowl Committee, before they are allowed to hunt on base and are added to the list of eligible hunters. USFWS establishes and USFWS agents and CDFG wardens enforce bag limits.

Figure 4-6

Hunting is open to active military personnel, civilian employees at the installation, retired military personnel, retired civilian employees at the installation, and their guests, in that order. The number of hunters allowed on any day is limited by the capacity of blinds available during a hunting season, which is established by the NBVC Office Waterfowl Hunting Committee. Hunting blinds are assigned by status (see above) followed by a first-come, first-serve basis. Anyone who helps build and repair blinds may also attain priority status.

The location of the blinds, near the air station runway (Figure 4-7) and in flight patterns, creates potential safety concerns, particularly for BASH issues. Another problem related to the current location of the blinds is their proximity to listed species and their habitat. Waterfowl hunting causes the greatest disturbance to waterbirds of all outdoor recreation that takes place at the lagoon. Gunshot from portable blinds in the interior of the estuary has caused pelicans to flush and leave their night roosts before sunrise. Shooting throughout the day generally prohibits use by pelicans of roosts inside the lagoon. In addition, several of the blinds have been closed in the past to protect populations of the salt marsh bird's-beak and habitat of the light-footed clapper rail. Because some blinds have been lost to protect salt marsh bird's-beak, hunting in the central basin is allowed only during 6 days out of the hunting season from two portable blinds (see Figure 4-7).

4.2.4.2 Wildlife Viewing and Education

The most visible point of special-interest outdoor recreation at NBVC Point Mugu is the view of Mugu Lagoon from a pullout adjacent to California State Highway 1 (Pacific Coast Highway) at the eastern edge of the installation. Mugu Lagoon is the largest remaining estuarine lagoonal system on the southern California coast between Morro Bay and San Diego. The lagoon supports seven threatened and endangered species at NBVC Point Mugu and provides an excellent wildlife observation and interpretive point for the 351 bird species identified.

The viewing site currently contains a dedicated seating area that overlooks the eastern arm of Mugu Lagoon. The site is considered an interpretive facility (NPS wayside stop) and contains a static display with information about migratory birds and wildlife. No interpretive materials are present, except for a large rock with a plaque that commemorates the dedication of the site in

Figure 4-7

1975. A sign, however, informs visitors that several rare, threatened, or endangered birds and plants are in the area and should not be disturbed.

4.2.4.3 Additional Outdoor Recreational Land Uses

The following areas at NBVC Point Mugu are used for recreation (Figure 4-6):

- The sand spit area on the barrier beach adjacent to the mouth of Mugu Lagoon is used for picnics, jogging, and observing wildlife.
- A group campground is located on the lagoon side of the barrier beach.
- Ecological tours that include ecological field classes, and lectures are available for groups such as the Audubon Society, universities and colleges, and other schools.
- Family Beach
- Nature trail
- Shore fishing at Family Beach and along the existing rock seawall is still permitted

4.2.5 NBVC Land Use Management and Development Plans

The Public Works Planning Branch at NBVC Point Mugu is responsible for establishing land use requirements of the installation, planning for future development, and overseeing construction of buildings. The base master plan sets a vision for the base as well as a strategy to attain it. The plan is being revised to reflect activities that are more recent and the current military mission of the installation. The existing master plan is guided by the following major goals (PMTC 1986).

- Establish an organized and functional land use plan to maximize use of Navy property among the station's departments and tenants that recognizes all natural and man-made constraints.
- Improve the efficiency of mission performance capabilities.
- Identify and correct deficiencies in existing base facilities and provide recommendations that will solve station-wide problems.
- Promote land use compatibility within the station and in relationship to the surrounding communities.
- Comply with all applicable federal and, insofar as possible, state, and local planning directives that guarantee the public's safety and the protection of environmental resources.

The Public Works Planning Branch uses a system of land use classification to plan future projects. The planning branch must approve sites for all future development. The majority of land at NBVC Point Mugu with high ecological value is currently classified as test and evaluation areas for military operations. Density of development in test and evaluation areas is typically low because buffers are required between facilities and their operations. These buffers enhance the compatibility of goals for management of natural resources with this land use.

4.2.6 Academic Research Land Use

A number of universities and academic institutions support management of natural resources at NBVC Point Mugu. The University of California at Los Angeles (UCLA), University of California at Santa Barbara, California State University at Long Beach (Cal State Long Beach), Occidental College, and Humboldt State University support specific tasks concerning ecological components of the salt marsh estuary. UCLA also provided technical expertise for the “green” design of the proposed Mugu Lagoon Visitor Education Center. The Natural Resources Office at NBVC Point Mugu continues to work closely with the University of Arizona Advanced Resources Technology Laboratory in developing and implementing the extensive Geographic Information System (GIS) database. Cooperative agreements are maintained between NBVC Point Mugu and these institutions to enable this work to proceed.

4.3 AIR QUALITY AND NOISE

This section describes ambient air quality for the air resources study area, which includes Ventura County. It also describes current noise levels at NBVC Point Mugu.

4.3.1 Ambient Air Quality and Air Emission Sources

Ventura County is considered a nonattainment area for state ambient ozone and particulate matter larger than 10 microns (PM₁₀) standards, and a severe nonattainment area for the federal ozone standard. The county is designated as an attainment area for other federal and state ambient air quality standards.

During 2000, air quality in Ventura County exceeded both the state and federal air quality standards for ozone and the state standard for particulate matter (Ventura County Air Pollution

Control District [VCAPCD] 2001). Statistics on ozone for 2000 indicate that Ventura County exceeded the 1-hour federal standard 1 day and exceeded the 8-hour standard 29 days (VCAPCD 2001).

Most emissions in Ventura County are derived from motor vehicles, which account for more than half of the air pollution in Ventura County. Other sources of pollution include business, industry, agriculture, fires, and household products (VCAPCD 2001). The smog season typically occurs from May through October, when emissions from motor vehicles and other sources, warmer weather, stagnant air, and increased solar radiation, allow ozone to form and hover above Ventura County.

Sources of emissions at NBVC Point Mugu include aircraft operations, motor vehicles, and various stationary sources such as aircraft engine test cells, fuel storage and handling facilities, boilers, and gas stations.

4.3.2 Air Pollution Control Regulations and Standards

The Ventura County Air Pollution Control District (VCAPCD) establishes the rules and regulations that govern air quality control. These rules and regulations are compatible with the California Air Resources Board and U.S. EPA air quality standards (VCAPCD 2001) and are summarized in Table 4-1.

EPA uses the Air Quality Index (AQI) (formerly known as the Pollutant Standards Index) as an indication of air quality to incorporate federal ozone requirements and PM_{2.5} standards. The index is designed to provide accurate, timely, and easily understandable information about daily levels of air pollution.

Table 4-1: Health-Based Ambient Air Quality Standards

	National Standards	California Standards
Ozone	.08 ppm* (8-hr avg) .12 ppm (1-hr avg)	.09 ppm (1-hr avg)
Carbon Monoxide	9.0 ppm (8-hr avg) 35.0 ppm (1-hr avg)	9.0 ppm (8-hr avg) 20.0 ppm (1-hr avg)
Nitrogen Dioxide	.053 ppm (annual avg)	.25 ppm (1-hr avg)
Sulfur Dioxide	.03 ppm (annual avg) .14 ppm (24-hr avg) .5 ppm (3-hr avg)	.04 ppm (24-hr avg) .25 ppm (1-hr avg)
Lead	1.5 $\mu\text{g}/\text{m}^3$ ** (calendar qtr)	1.5 $\mu\text{g}/\text{m}^3$ (annual avg)
Particulate Matter (PM₁₀)	50 $\mu\text{g}/\text{m}^3$ (annual avg) 150 $\mu\text{g}/\text{m}^3$ (24-hr avg)	30 $\mu\text{g}/\text{m}^3$ (annual avg) 50 $\mu\text{g}/\text{m}^3$ (24-hr avg)
Particulate Matter (PM_{2.5})	15 $\mu\text{g}/\text{m}^3$ (annual avg) 65 $\mu\text{g}/\text{m}^3$ (24-hr avg)	

*ppm = parts per million $\mu\text{g}/\text{m}^3$ = micrograms per cubic meters

4.3.3 Clean Air Act (CAA) General Conformity Rule

Section 176(c) of the CAA, as amended, requires federal agencies to ensure that actions undertaken in nonattainment or maintenance areas are consistent with the CAA and with federally enforceable air quality management plans. The U.S. Environmental Protection Agency (USEPA) General Conformity Rule applies to federal actions occurring in nonattainment or maintenance areas when the total direct and indirect emissions of nonattainment pollutants (or their precursors) exceed specified thresholds. The *de minimis* levels for O₃ and particulate matter less than 10 microns in diameter (PM₁₀) are 25 tons (50,000 pounds or 22,680 kilograms [kg]) and 100 tons (200,000 pounds or 90,720 kg) per year, respectively. Compliance is presumed if the net increase in direct and indirect emissions from a federal action would be less than the relevant *de minimis* level. However, if the increase in emissions for a nonattainment pollutant exceeds the relevant *de minimis* level, a formal conformity determination process must be followed.

4.3.4 Noise

Sounds that disrupt normal activities or that otherwise diminish the quality of the environment are designated as noise. Noise can be stationary or transient, and intermittent or continuous. Community response to noise is based on a subjective assessment of the daily environment.

Factors that affect this subjective assessment include the levels of individual events, the number of events per day, and the time of day. Ambient noise levels at NBVC Point Mugu range from 40 to 60 decibels (dB).

This section presents existing conditions for activity-specific generated noise at NBVC Point Mugu from two sources:

- The Air Installation Compatible Use Zone (AICUZ) 1992 study
- Noise studies for the 1998 NBVC Point Mugu Environmental Impact Statement

4.3.4.1 AICUZ NBVC Point Mugu Noise Study

The AICUZ program was established to ensure land uses that are compatible with military air installations and to promote courses of action that encourage harmonious land use. AICUZ addresses noise and accident potential zones (APZs). Noise levels measured for the AICUZ at NBVC Point Mugu are based on the flight tracks and operational data obtained in the Aircraft Noise Survey conducted in 1990. The study employed a contour system called the Community Noise Equivalent Level (CNEL). CNEL was developed for the State of California to provide average daily noise contours. The AICUZ study delineated the following three noise zones at NBVC Point Mugu: Noise Zone 3 (above 75 CNEL), Noise Zone 2 (65 to 75 CNEL), and Noise Zone 1 (below 65 CNEL). Areas that fall within Noise Levels 2 and 3 are considered unacceptable for most residential use by California state law. All land uses are generally considered acceptable in Noise Zone 1. Results of the AICUZ study published in 1992 indicate that all but a small portion of NBVC Point Mugu (the far eastern and the far western ends) falls within Noise Zones 2 and 3.

4.3.4.2 Activities that Generate Noise at NBVC Point Mugu

The Natural Resource Management program at NBVC Point Mugu has identified five activities that may affect federally listed threatened or endangered species because of a high incidence or level of noise. Noise concerns associated with these activities are summarized below:

Target Drone Launches: noise from the launches, although short in duration, may be loud and can displace birds from their nest or roosting and foraging areas, leaving eggs, young, and adults more susceptible to predation or environmental stress (USFWS 2001b). Acoustic recordings collected from target drone launches in November 1997

indicate that noise levels ranged from 92.8dB to 144.7 dB for sound pressure and 92.2.3 dB to 144 dB for sound exposure. These levels indicate a high incidence of noise in the area used by listed species for forage, breeding, or roosting (Keeney 1999).

Aircraft Overflights: The highest jet noises at NBVC Point Mugu come from aircraft during takeoff and touch-and-go practice. The height of the aircraft and distance to occupied habitat control the effect of the noise on listed bird species (USFWS 2001b). Noise levels from aircraft operations that exceed the ambient background level typically occur beneath the main approach and departure corridors and in areas immediately adjacent to parking ramps and aircraft staging areas. Noise levels from E-2C range from 89 dBa on approach power to 99.5 dBa on takeoff power at 50 feet. This area and activity are immediately adjacent to habitat for sensitive species (Keeney 1999).

Beach Missile Launch Operations and Associated Activities: Noise from the launches is short but can be loud, with levels that exceed 144 dB. These short, loud noises disrupt nesting, displacing nesting or roosting birds, leaving young and adults susceptible to predation or environmental effects.

Maintenance of Roads and Facilities: Maintenance involves noise, loud machinery, and human activity near habitat for listed species.

CBC/NBVC Police Operations: The small-bore range firing line is located at the edge of occupied snowy plover habitat. Loud popping sounds startle birds and cause them to take flight.

4.3.4.3 Sensitive Receptors to Noise

Aircraft operations affect listed species primarily through noise. Flight paths cross above nests of the snowy plover and California least tern on the sandy beach. California least terns and brown pelicans forage over the ocean's near-shore environment as well as in many areas of Mugu Lagoon's open-water habitats. Light-footed clapper rails inhabit intertidal salt marsh and forage within the intertidal creeks and edge of the intertidal mudflat. Snowy plovers nest and forage within the salt panne habitat. The vicinity of these species to the runways makes them susceptible to disturbances from aircraft overflight.

Other sensitive receptors include residential users on and adjacent to NBVC Point Mugu. On-base sensitive receptors are facilities that provide community support and housing located north of Runway 27. The off-base receptors include a residential area west of Runways 9 and 27.

4.3.4.4 Noise Standards and Monitoring

The dB is the unit commonly used to describe sound levels. The zero end of the scale approximates the lowest level sound that an average human can hear. Ordinary conversation produces a noise level of approximately 60 dB, very noisy levels are at 100 dB. A value of about 120 on the scale corresponds roughly to the point when sound becomes painful. AICUZ noise standards are shown in Table 4-2.

TABLE 4-2 DESCRIPTION OF NOISE ZONES		
AICUZ Noise Zone	Percent Population Highly Annoyed	Sound Level
I. Compatible	<15	<65 dBA
II. Normally Incompatible	15-39	65-75 dBA
III. Incompatible	>39	>75 dBA
DBA decibels, A-weighted: (weighted for number of events and time of day)		

4.4 GEOLOGY AND SOILS

NBVC Point Mugu lies at the southern end of the Ventura Basin and west of the Santa Monica Mountains. The mountainous terrain adjacent to the Oxnard Plain is tectonically active and is composed of various hard and soft sedimentary deposits, primarily of marine origin, along with some igneous deposits. A combination of ongoing tectonic uplift and the prevalence of easily eroded sedimentary deposits in adjacent mountains have resulted in high rates of erosion and sediment yield in coastal watersheds throughout the region, including Calleguas Creek.

The Oxnard Plain, and specifically the area of Point Mugu, has undergone geomorphologic change for tens of thousands of years. Throughout the Pleistocene glacial epoch, sediment was transported down valleys in the Calleguas Creek watershed and either delivered at the shoreline to form estuarine and beach environments, or carried off the edge of the shelf into deep water. Streams were incised on the delta plain during the late Pleistocene, about 18,000 years before present, and it is likely that Calleguas Creek was connected to the Mugu Submarine Canyon. The sea level has risen steadily since that time. By the late 19th Century, surface water is believed to have infiltrated through soil and evaporated before it reached the

ocean, recharging the now extensive aquifers that underlie the delta plain and depositing sediments throughout the delta plain. This combination of tectonic activity and sediment transport and deposition has created the current configuration of Mugu Lagoon.

The Bailey Fault delineates the boundary between the Ventura Basin and the Santa Monica Mountains and is believed to control the location of Calleguas Creek (Fugro-McClelland 1991). A generalized geologic cross section across the Oxnard Plain from NBVC Point Mugu northwest toward Ventura is shown in Figure 4-8. The Ventura Basin consists of more than 40,000 feet of sediments, resulting in a broad coastal lowland known as the Oxnard Plain. The uppermost sedimentary layers of the Oxnard Plain are composed of quaternary alluvium. Additional unconsolidated water-bearing soils and sediments known as the San Pedro and the Santa Barbara Formations underlie the alluvium. The unconsolidated sediments that underlie NBVC Point Mugu range from about 900 to 2,300 feet thick and consist of alluvial clays, silts, sands, and gravels. The deposits occur as both laterally continuous layers and as lenticular beds. Based on published geologic information described in this section, mineral resources of economic value are unlikely to be present under NBVC Point Mugu.

The geology study area falls within an area identified by the California Department of Conservation, Division of Mines and Geology, as a zone of high seismic hazard for liquefaction potential and strong earthquake shaking (California Department of Conservation 2001). The California Department of Conservation, Division of Mines and Geology, maps areas where historical occurrence of liquefaction or local geological, geotechnical, and groundwater conditions indicate a potential for permanent ground displacement.

Currently, a diverse array of soil and sediment types is present at NBVC Point Mugu. Shallow soils and sediments have been deposited in stream and tidal lagoon environments. Historical depositional areas have shifted numerous times, and soils and sediments from different depositional environments are intermingled throughout NBVC Point Mugu. Native soils at NBVC Point Mugu and the Oxnard Plain are primarily alluvial and are easily eroded by surface water flows (Steffen 1982). Almost all of the land at NBVC Point Mugu is composed of tidal flats or imported fill that has been mechanically compacted to make it suitable as a building site. Fill underlies the majority of the developed areas in the base at varying thicknesses.

Figure 4-8

4.5 HYDROLOGIC RESOURCES

This section describes surface water and groundwater resources in the affected environment. The hydrology study area includes NBVC Point Mugu and the Calleguas Creek Watershed. Wetlands are described in Section 4.6. Natural and human-induced factors control the quality and quantity of water resources and are described when relevant to this evaluation.

4.5.1 Surface Water that Contributes to Mugu Lagoon

Surface water at NBVC Point Mugu includes perennial streams, drainage ditches, intertidal wetlands, and the Mugu Lagoon. Low elevations and mild slopes characterize most of the base; therefore, the velocity of surface water flow tends to be very low. Surface runoff from the base drains into the network of ditches and culverts that ultimately lead to Mugu Lagoon or Calleguas Creek. Surface water along the barrier beach in the southern portion of the base drains directly to the Pacific Ocean to the south and to Mugu Lagoon in the north. Generalized drainage areas are shown on Figure 4-2. Much of the area surrounding the lagoon and extending west from the lagoon's western limit is tidally inundated. Large duck ponds are located north of the western portion of the base (Figure 1-1).

4.5.1.1 Off-site Surface Water Source and Quality

Perennial freshwater streams in the Oxnard Plain consist of Calleguas Creek and its tributaries, Revolon Slough and Conejo Creek, located in the upper reaches of the watershed. These streams drain an area of about 325 square miles, including mountainous areas and level flood plains in the southern portion of the Oxnard Plain (Steffen 1982). Flows in these streams ultimately discharge to Mugu Lagoon and are the primary source of freshwater input.

Calleguas Creek receives discharges from the following non-saltwater sources: agricultural irrigation return flows, National Pollutant Discharge Elimination System (NPDES)-permitted discharges, and storm water runoff. Twenty NPDES-permitted discharges contribute about 31.7 million gallons per day (mgd) or 49.2 cubic feet per second (cfs) to Calleguas Creek, most of which readily percolates into the sediments of the creek beds before reaching Mugu Lagoon (Birosik 1993).

Under normal conditions, the majority of flow in the Calleguas Creek drainage area is a result of agricultural irrigation return. Revolon Slough, which receives runoff from 38,200 acres of agricultural land, joins Calleguas Creek just within the boundary of NBVC Point Mugu, about 1.5 miles upstream from Mugu Lagoon.

The flow in Calleguas Creek is highly responsive to rainfall. Peak flows in Calleguas Creek have been estimated for various storm intensities: in a 2-year storm, maximal flow is estimated at 2,500 cfs, while a 10-year flood results in a flow of 11,810 cfs into Mugu Lagoon (Simons, Li and Associates 1989).

4.5.1.2 On-site Surface Water

Surface water at NBVC Point Mugu is transported from a variety of directions by structural controls composed of a basin-wide storm drain system, interconnected drainage ditches, and Calleguas Creek, which all eventually flow to the Mugu Lagoon. Flow in Calleguas Creek is perennial and tidal. Storm water drainage of the entire system, including the basin-wide storm drain system, is influenced by tidal fluctuations, especially during extreme tides and coastal storms. On a daily basis, tide water flows up the drainage ditches and, in many cases, into outfalls. Water ponds periodically in many low, undrained areas throughout the facility from precipitation.

Significant flooding does not occur during average rainfall. The USACE reports predict minor flooding at NBVC Point Mugu from events with a frequency return interval of 6 years. The most recent flood occurred in February 1998, when high runoff within the base that coincided with high flows in Calleguas Creek caused substantial damage in housing and other areas of the base, primarily from inundation of streets and lots (USACE 1998).

4.5.2 The Mugu Lagoon

Aside from the Pacific Ocean, Mugu Lagoon is the most significant surface water body at NBVC Point Mugu. The hydrology of the lagoon is a function of freshwater inputs, tidal influence and flushing, and physical modifications to surface water flow. Mugu Lagoon is divided into three distinct areas: the western arm, the eastern arm, and the central basin, and each responds in a different manner to water circulation and sedimentation (Figure 4-3).

Mugu Lagoon is relatively shallow (generally less than 10 feet deep at high tide). Circulation patterns within the lagoon, and the rate of flushing, are dictated by tidal influence and the quantity of fresh water that enters the lagoon from Calleguas Creek, Revolon Slough, and the Oxnard drainage ditches.

4.5.2.1 Influence of Sea Water and Fresh Water on Mugu Lagoon

Mugu Lagoon is connected to the Pacific Ocean via an opening through a barrier beach and is heavily influenced by tidal action. Tidal action is primarily responsible for flushing water and sediment into and out of Mugu Lagoon. Information collected indicates that the tidal prism — the volume of water moved in and out of the lagoon by the tides — is large in comparison to the water retained in the lagoon during low tide.

The configuration of the central basin of the lagoon is affected by surface water and sediment input from Calleguas Creek, Revolon Slough, and the Oxnard drainage ditches (Figure 2-1). During the rainy season (winter), the central basin receives larger inputs of sediment than during other times of the year. The mean annual suspended sediment flux of Calleguas Creek during the period 1944 through 1995 is 621,000 tons per year (U.S. Navy 2002). The percent of this sediment load that remains in the lagoon versus the portion that is transported to the ocean is unknown.

The western arm of Mugu Lagoon receives the majority of surface water runoff from storm water at NBVC Point Mugu and an Oxnard drainage ditch. The drainage ditch transports agricultural and storm water runoff from sources off base. The gradual slope of and slow currents in the drainage ditches that empty into the western arm generally limit the carrying capacity for the sediment load. The lagoon's western arm is connected to the central basin, and ultimately to the ocean, through culverts under Laguna Road (Figure 4-3). These culverts restrict flow under Laguna Road, limiting the hydrologic flushing rate of the western arm and the exchange of sediment with the central basin (Steffen 1982).

The eastern arm receives limited freshwater input from the adjoining Laguna Peak and Point Mugu State Park to the north. Runoff from those areas flows through a series of culverts south of Highway 1. The eastern arm of the lagoon connects to the central basin via tidal channels.

and flats that are constantly changing with tides, storm flows, and location of the inlet. During floods, especially when they are associated with high tides, the marshes on the eastern side of the lagoon are inundated with fresh water. The volume of sediment carried into the lagoon from these sources is unknown.

4.5.2.2 Quality of Water in Mugu Lagoon

This section presents information on the physiochemical characteristics important to the ecosystem at NBVC Point Mugu, including water temperature, salinity, and dissolved oxygen, as well as bottom sediments and solar radiation.

The moderate temperatures of the ocean at the mouth of the lagoon govern the temperature in the lagoon (U.S. Navy 2002). Surface water temperatures measured at Zuma Beach, 25 kilometers southeast, range from monthly means of 13°C to 18°C (U.S. Navy 2002). Because of the rapid tidal flushing, factors that operate within the lagoon are of secondary importance. However, air temperature and insulation become increasingly important in the shallower and more landward subtidal areas. These factors, however, predominate during low tide at the surface in the intertidal zone and influence the emergent vascular plants of the salt marsh the majority of the time.

Salinity in Mugu Lagoon is considered estuarine (34 parts per thousand [ppt] salinity) most of the time (U.S. Navy 2002). After rainfalls, salinity decreases for a short time and has been measured at 19 ppt 1 day and at 28 ppt 2 days after a 2-centimeter rainfall. The three major areas of the lagoon (west arm, central basin, and east arm) differ somewhat. Because of the low relief of the Mugu Lagoon watershed, water runs off slowly, even through the network of agricultural drainage ditches in the area. In addition, the western part of the lagoon consists mainly of emergent marsh and long, shallow channels that, for the most part, are not confined by artificial levees.

Levels of dissolved oxygen generally are high in the lagoon because of the high rates of tidal exchange and shallow depths, where water is easily mixed by winds (U.S. Navy 2002). In some cases, however, reducing conditions often develop beneath senescent mats of the green algae. These algal mats are found in the deepest parts of the lagoon and in a wrack line at the edge of

the marsh in late summer. The mats affect the underlying sediments but apparently do little to affect the overlying water.

4.5.3 GROUNDWATER

Six aquifers have been identified within the top 2,000 feet of unconsolidated sediments in the Calleguas Creek watershed. Aquitards that are leaky and discontinuous across the basin separate the aquifers (TtEMI 2001a). Groundwater along the coast between Port Hueneme and NBVC Point Mugu flows toward the Pacific Ocean. Groundwater elevations are above sea level throughout the Oxnard Plain, except in the southern area of NBVC Point Mugu. The primary source of recharge for the groundwater basin in the Oxnard Plain is the unconfined northeastern portion of the basin, known as the Oxnard Forebay or Montalvo Basin (Figure 4-2). High groundwater levels in the forebay exert a positive pressure on the confined aquifers of the Oxnard Plain, resulting in regional groundwater flow from the recharge areas toward the ocean.

4.5.3.1 Descriptions of Aquifers

Aquifers that may be significant to natural resource planning at NBVC Point Mugu are the two uppermost aquifers: the Semi-Perched and the Oxnard. The Semi-Perched Aquifer is located near surface at a depth of 2 to 20 feet below ground surface (TtEMI 2001a). Groundwater in the Semi-Perched Aquifer underlying NBVC Point Mugu generally flows toward the Mugu Lagoon. The Semi-Perched Aquifer is assumed to discharge primarily to surface water, including the Pacific Ocean, Santa Clara River, Revolon Slough, Calleguas Creek, Mugu Lagoon, and numerous drainage ditches. Groundwater quality in the Semi-Perched Aquifer is poor and it is not generally used for either domestic or agricultural purposes.

The confined Oxnard Aquifer is located 125 to 175 feet below ground surface at NBVC Point Mugu. The Oxnard Aquifer is a major producer of groundwater and is considered the principal aquifer beneath the Oxnard Plain. Except for areas where seawater intrusion has occurred, the Oxnard Aquifer contains high-quality groundwater. Recharge of the Semi-Perched Aquifer is primarily through infiltration of precipitation and artificial recharge.

4.5.3.2 Seawater Intrusion

Seawater intrusion on groundwater of the Semi-Perched and Oxnard aquifers at NBVC Point Mugu has raised concentrations of total dissolved solid (TDS) and changed major anion and cation chemistry of the groundwater so that it is similar to seawater (Hem 1992). Water districts within the Oxnard Basin, such as the Calleguas Municipal Water District and the United Water Conservation District (UWCD) for Ventura County, worked with users to restore historical groundwater gradients in the Oxnard Aquifer through artificial recharge, new water management facilities, and improved water management practices throughout the Oxnard Plain. As a result, intrusion of seawater has been repelled in the Oxnard Aquifer, and the direction of groundwater flow is once again toward the ocean (UWCD 1996; UWCD 1998).

4.6 JURISDICTIONAL SPECIAL AQUATIC SITES

This discussion describes SAS, including wetlands, at NBVC Point Mugu and that fall under the jurisdiction of USACE. Currently, a variety of definitions for the term “wetlands” are in use by different federal and state agencies. The term wetland is based on the USACE definition in this EA (and in the proposed INRMP). USACE is responsible for delineating the jurisdictional boundaries of wetlands for regulatory and permitting purposes under Section 404 of the CWA. In developing a field method for delineating the boundaries of a wetland, USACE established a “three-parameter test” that considered hydrophytic vegetation, hydric soils, and wetland hydrology. Under the USACE definition, an area is considered a wetland only if all three parameters are present; wetlands are (USACE 1987):

Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

4.6.1 Jurisdictional SAS Delineated in the Study Area

The federal extent of all jurisdictional SASs, including wetlands, at NBVC Point Mugu is shown in Figure 4-9. These sites were rated for wetland function and value and assigned to one of four categories based on tidal influence, existing habitat type, and the potential to support listed species. These categories would be included as factors in development of the INRMP natural resources constraints shown as Figure 2-1.

Figure 4-9

According to USACE Regulatory Guidance Letter 94-01, wetland delineation is valid for only 5 years. NBVC Point Mugu is updating the delineation of jurisdictional wetlands and intends to complete the process in 2002. Until this goal is achieved, all jurisdictional wetlands will be delineated on a project-by-project basis with assistance from the USACE, Ventura Field Office.

The jurisdictional delineation of wetlands following USACE (1987) criteria identifies wetlands versus non-wetlands by establishing boundaries between these areas rather than by describing the types of wetlands present. This system is useful for evaluating whether a wetland is present, but it provides little information on the type of wetland habitat present or its associated ecological community. Because of slight variation in factors such as tidal regime, drainage, and elevation, several different wetland habitat types are present within Mugu Lagoon, and each supports a unique complex of flora and fauna.

The ecosystem of Mugu Lagoon contains more than jurisdictional wetlands. It is a diverse and complex ecosystem characterized by multiple habitat types that play a significant role in the functioning of the Mugu Lagoon. Fresh water from precipitation runoff and from movement of water from the adjacent duck ponds help maintain the habitats for salt marsh bird's-beak and light-footed clapper rail by maintaining a balance of fresh and brackish water. Sand on the beaches supports nests for snowy plovers and California least terns that forage in the wetland habitats. Flow from Calleguas Creek flushes the lagoon and transports sediment necessary to maintain the beaches. The ecosystem of Mugu Lagoon depends on the interaction among all of these habitats.

4.6.2 Wetlands Restoration Areas

Six wetland restoration sites and mitigation bank projects are under way within Mugu Lagoon, and one is proposed. The goal of all projects is to produce viable, functioning coastal wetlands that closely resemble natural estuarine systems in both structure and value. These projects are managed together under the Wetland Restoration MEA. Wetland restoration sites are shown on Figure 2-2, summarized in Table 4-3, and described in this section.

Table 4-3 NBVC Point Mugu Wetland Restoration Projects

Restoration Site	Year	Acres	Wetland Type	Status
NCR Small Arms Range	1995	1	Mudflat	Completed; full tidal prism flow; monitoring plants invertebrates, fish, birds
"L1" Avenue	1997	3.5	Mudflat and sand bar, upper intertidal salt marsh	Completed; muted tidal flow; monitoring plants invertebrates, fish, birds
"L2" Avenue		2.06	Mudflat and sand bar, upper intertidal salt marsh	In progress
LAG4	1997	18	Tidal creek, mudflat, salt marsh, two large sand islands	Completed; full tidal prism; mitigation bank plan completed: USACE; monitoring plants invertebrates, fish, birds
South "J" Avenue	1997	1	Mud flat, salt marsh	Completed; monitoring plants invertebrates, fish, birds
Oxidation Ponds	1997	2.5 (30)	Salt marsh, tidal creeks, mud flat, salt panne	Pilot project in construction innovated technology sludge remediation; mitigation bank prospectus planned
Las Posas Road	Proposed			

L1 Wetland Restoration Site (L1), a 3.5-acre parcel located on the northeast corner of L Avenue and Island Avenue. This site mitigates various projects that filled jurisdictional wetlands (salt pannes) in the base housing areas. Some parcels were remnant wetlands. Other parcels were wetlands that were inadvertently created when the Navy constructed the housing area and left low-lying areas after the sites were graded. All of these areas were highly degraded, non-functional wetlands.

L2 Wetland Restoration Site (L2) is the result of a USACE Order for Restoration, Enforcement Case No. 200000017-LM (U.S. Navy 1999). The order was issued to mitigate 1.19 acres of fill at the wastewater treatment facility pipeline project, 0.46 acres of fill along Perimeter Road as part of repair to the security fence and road shoulder, and 0.14 acres of fill at the recreational jogging track. Also included in the total acreage to be mitigated is 0.25 acres for the new pond road. This project will restore 2.04 acres of a wetland as a salt marsh estuarine system by 2001. In addition, 1.19 acres of jurisdictional wetlands within the project area are being considered for enhancement.

Laguna Road Wetland Restoration and Enhancement Mitigation Bank (LAG4) was restored by the Navy in 1997. Formerly known as Site 4 in the Installation Restoration Program (IRP), this parcel served as a storage yard for Public Works. The site was contaminated with polychlorinated biphenyls (PCBs) and metals. After the site was remediated, the parcel was restored to estuarine wetland habitat under the collaborative direction of the Natural Resource Manager and the IRP manager. This restoration project includes functional tidal creeks, intertidal mudflats, and two sandy nest islands. These islands have become viable nesting habitat for the California least tern.

Currently, when they are not being used by California least terns for nesting, these islands are used by waders, waterfowl, and shorebirds for high tide roosting, preening, and nesting during migration and over winter periods. Because of their importance as habitat and because of ongoing management needs, these nest islands are also included in the Tern/Black Skimmer Nest Island MEA.

Oxidation Ponds Wetland Restoration Mitigation Bank (OP) project was developed out of a need to evaluate alternatives to landfilling for disposal of waste sludge and to restore wetland habitat. This project uses contaminated sewage sludge mixed with clean soil to create wetland habitat within Mugu Lagoon (Vance and others 2000). This in situ remediation technique will replace the need for landfill disposal of 56,000 tons of sewage sludge that contains elevated levels of metals. This study is being conducted with an adaptive management strategy. Small-scale experiments were conducted before the current pilot study began. The results of the pilot study will guide full-scale restoration (in other words, which of several practical soil mixtures that contain sludge produces the highest ratio of environmental benefit to environmental cost).

Measurement of heavy metals that leach from the site is still under way. No acute individual or population-level toxicity has been observed to date in the pilot study. These results are consistent with the previous, smaller-scale experiments. Ongoing monitoring will address chronic toxicity and accumulation and migration of metals. Results to date suggest that it will be feasible to incorporate sludge into the final restoration project with minimal detrimental effects from heavy metals

South J Wetland Restoration Site (SJ) is an approximately 1.5 acre site that serves as mitigation for jurisdictional wetlands on base that were filled without authorization by flooding during a winter storm. An unused road and camera pad were excavated to predetermined elevations to restore tidal flow, form an ephemeral tidal mudflat that would eventually succeed into salt marsh habitat, and create an ephemeral island mudflat that could be used as a roost site for waterfowl, shorebirds, and waders. This estuarine restoration site was completed in November 1997.

31st NCR Small Arms Range Wetland Restoration Site (CBC) was mitigated after 0.05 acres of an isolated, degraded wetland was filled so that the Construction Battalion Center's 31st Regiment could construct a 1,000-inch high-velocity, small-bore range. Approximately 1 acre of estuarine tidal mudflat with a small island of salt marsh was restored. Mitigation has been accomplished as an out-of-kind restoration project with a 1:1 ratio.

Las Posas Road Wetland Restoration Mitigation Bank (LPR) is a planned restoration of tidal wetlands at the former lagoon landfill, known as IRP Site 1. The site is located adjacent to Mugu Lagoon, near the mouth of Calleguas Creek. The landfill is no longer in use and is unoccupied, except for storage boxes and other equipment located on a paved area within the boundary of the landfill. The restored area will be designed and constructed as a vegetated marsh, as opposed to a mudflat, to improve retention of contaminants.

4.7 BIOLOGICAL RESOURCES AND HABITAT COMMUNITIES

Several habitats occur at NBVC Point Mugu (Figure 4-10). Habitat type is based on dominant plant species and physiognomy and described in this section in terms of the interrelationship between flora and fauna within each habitat community. A full species list is provided in Appendix B.

The most prominent combination of habitats at NBVC Point Mugu is associated with Mugu Lagoon, a 2,500-acre (1,010-hectare) estuarine coastal salt marsh that provides food, nesting, sheltering, breeding, and nursery habitat for numerous benthic invertebrate, fish, bird, and plant species. These habitat types are composed of intertidal mudflats and sandflats, intertidal salt marsh, tidal creeks, and salt pannes. Other habitats found on NBVC Point Mugu include beach and dunes, drainage ditches, transition disturbed, and developed areas. Descriptions of habitat communities, including the fauna supported by each type, are provided in this section. These descriptions are summarized from information gathered by the NBVC Point Mugu Natural Resources Management Program for the proposed INRMP.

4.7.1 Beaches and Dunes

A myriad of environmental influences such as wind and wave action, salt spray, high temperature, and moisture affect the dynamics of the shoreline habitat. Several plants and animals are adapted to these influences and inhabit the beach and dune habitat. Much like the intertidal salt marsh, it is widely recognized that most of the beach and dune habitats have been destroyed in southern California. Consequently, beach and dune species (for example, western snowy plover [*Charadrius alexandrinus nivosus*], California least tern [*Sterna antillarum browni*], and globose dune beetle [*Coelus globose*]) are vulnerable to local extirpation. Consequently, this small portion of the estuary is of high value to animal species.

Most of the beach and dune habitat type has not been developed or severely degraded by perturbations caused by humans. Sand along the shoreline has eroded severely at NBVC Point Mugu over several decades from loss of or interruption of littoral sand transport. Most of the beach dune complex is a sparse combination of perennial forbs, grasses, and low shrubs that

Figure 4-10

form a ground cover. Native plant species that are dominant in this habitat type include the dune primrose or sun cups (*Camissonia cheiranthifolia*), sand verbena, beach bursage (*Amdrosia chamissonis*), and beach morning glory (*Calystegia soldanella*).

Patches of European beachgrass and iceplant occur as emergent species in this habitat type and are dominant. Other non-native plants that invaded this habitat but that have not become problematic include sea rocket (*Cakile maritime*) and saltbushes (*Atriplex* spp.). These invasive dune plants have adverse effects on native plants and animals and often displace native species such as sand verbena. Iceplant (*Carpobrotus edulis*) is displacing native dune plants at NBVC Point Mugu and has invaded some beaches.

The western snowy plover, a species the federal government lists as threatened, nests on the open sandy beach. The western snowy plover can be associated with the California least tern, which nests in colonies. Western snowy plovers nest in depressions or scrapes and lay an average of three eggs. Chicks leave the nest within 24 hours after they hatch and immediately follow the male to foraging areas along the sandy shoreline, salt panne, and, at times, mudflat. Western snowy plovers feed mainly on invertebrates along the water's edge and on the sandy shoreline. At NBVC Point Mugu, all beach and dune habitat except for open recreational beaches is suitable for and is occupied by the western snowy plover.

The California least tern also nests on open sandy beach habitat. Much like western snowy plovers, their eggs and chicks are vulnerable to a variety of predators as well as to human disturbance. Both terns and plovers seem to prefer some amount of dune vegetation nearby. Females lay an average of two eggs in scrapes, and the parents feed fish to the young. Young California least terns fledge at 3 weeks. Estuaries and inland lakes are preferred areas for foraging terns, especially fledglings. At NBVC Point Mugu, California least terns occupy suitable habitat on the west portion of the station known as East Ormond Beach.

Belding's savannah sparrow (*Passerculus sandwichensis beldingi*), a California state endangered songbird, often forages on the dunes and beaches, especially when an abundance of kelp has washed ashore.

4.7.2 Intertidal Mud and Sandflat

The conspicuous species of the sandflats and mudflats are the shorebirds that feed and rest there during low tide. Most of the invertebrate species that serve as food for the shorebirds were discussed in the section on estuarine channels and tidal creeks. Many of the prey animals are distributed from the subtidal channels to the lower limit of the salt marsh.

Four invertebrate species that are characteristic of exposed flats are the California horn snail, the yellow shore crab, the fiddler crab (*Uca pugnax*), and the lined shore crab. There are no quantitative data on any of these species for Tijuana River Estuary. It is known only that the horn snails can be extremely abundant (hundreds to thousands per meter squared), and that both horn snails and crabs are important foods for the light-footed clapper rail (U.S. Navy 2002).

Coastal salt marshes and estuarine areas play important roles as feeding areas during the annual cycle for shorebirds, as well as other taxa such as wading birds, waterfowl, grebes, coots, and rails. Some investigators consider sandy beaches the prime habitat for shorebirds during their migration. However, that theory conflicts other information about use of the habitat by shorebirds. Various habitat types, such as intertidal mud and sandflats, estuarine channels, and tidal creeks, as well as intertidal salt marsh and salt pannes, provide shorebirds with habitat for foraging and resting during their extensive migrations. Shorebirds are especially vulnerable to loss of habitat because many return to the same, highly productive sites along migration routes and in wintering areas every year (Smith and Houghton 1984; Johnson and Baldassare 1988).

Mugu Lagoon now serves as critical foraging and roosting habitat for shorebirds on their spring and fall migrations and for overwintering. Mugu Lagoon provides habitat for up to 66,000 shorebirds during the spring and more than 10,000 at times in the fall and winter. It has been recognized as a potential site of regional and possible international significance, was listed as a potential Western Hemispheric Shorebird Reserve Network (WHSRN) location, and was ranked in the top 15 out of 96 potential sites in the region.

4.7.3 Intertidal Salt Marsh

The vegetation in the salt marsh changes gradually with elevation, with almost every species exhibiting its peak occurrence at a different elevation belt. The vegetation of this habitat forms a continuum rather than a set of zones. However, the presence of shrub-like succulents, pickleweed, and grass like vegetation, salt grass at the uppermost elevations, and the taller jaumea (*Jaumea carnosa*) and sea-blite (*Sueda californica*, *S. esteroa*) at the lowest elevation helps to designate the higher and lower marsh habitats. Unlike the drought-deciduous coastal scrub species, the plants of the salt marsh grow through the summer and early fall, presumably, because the wetland plants have access to moisture from tidal waters throughout the dry summer and fall.

Although the salt marsh appears to be a community dominated by plants, it provides habitat for a wide variety of animals, which include a diverse assemblage of migratory bird species (such as shorebirds), as well as the California endangered resident Belding's savannah sparrow. Large shorebirds and waders forage and rest in the marsh, and smaller shorebirds use the marsh as a nocturnal roosting site. Insects and benthic invertebrates are likewise abundant in the intertidal salt marsh. The structure of this habitat supports a complex food web.

Herpetofauna are limited to areas of high ground. Snakes are not common, and their rarity partly explains the abundance of rodents such as ground squirrels and rabbits (*Lepus californicus* and *Sylvillagus auduboni* *sactidiegi*) that populate the upper marsh. The Pacific diamond-back rattlesnake (*Crotalus atrox*) inhabits the upper fringe of the intertidal salt marsh habitat.

Birds that have been documented to feed or nest in the high marsh of Mugu Lagoon include the black-necked stilts (*Himantopus mexicanus*), American avocets (*Recurvirostra americana*), song sparrow (*Melospiza melodia*), western meadowlark (*Sturnella neglecta*), red-winged blackbirds (*Agelaius phoeniceus*), and killdeer (*Charadrius vociferus*). Other birds use the area extensively for foraging. Raptors, such as the northern harrier (*Falco sparverius*) and red-tailed hawk (*Buteo jamaicensis*), exploit the populations of small mammals, while Belding's savannah sparrows (*Passerculus sandwichensis beldingi*), horned larks (*Eremophila alpestris*), and wintering loggerhead shrikes (*Lanius ludovicianus*) feed on insects and other small prey.

Characteristic plants of the higher marsh are the perennial glasswort (*Salicornia subterminalis*), shoregrass (*Monanthochloe littoralis*), alkali heath, sea lavender, and salt bush (*Atriplex watsonii*). All of these species are perennials that reproduce vegetatively. Only during the rainy spring of 1995 and 1998 was there conspicuous establishment of plants by seeding. The federal and California state endangered salt marsh bird's-beak (*Cordylanthus maritimus* spp. *maritimus*) occurs in the higher marsh and more dominantly in areas where tidal flow of salt water is reduced but flow of fresh water is increased. This annual plant apparently survives the warm dry summer because it is hemi-parasitic. Its roots develop haustoria that penetrate a variety of other species to gain water and nutrients. Subpopulations of salt marsh bird's-beak sometimes disappear for a year or more.

Intermediate elevations of the salt marsh are much more frequently wetted by the tides. Higher tolerance for inundation is required of both the plants and infauna. The dominant plant is the perennial pickleweed (*Salicornia virginica*), which inhabits the broadest elevational range of all the species in the salt marsh.

Although pickleweed forms monotypic canopies in many of the region's lagoonal wetlands, it is usually mixed with several other succulents at Mugu Lagoon. It is postulated that arrow-grass (*Triglochin concinnum*) and sea-blite (*Suaeda esteroa*) were common cohabitants, and that saltwort (*Batis maritima*) and annual pickleweed (*Salicornia bigelovii*) dominated areas that were poorly drained (U.S. Navy 2002). The latter two species are most abundant around intertidal pools of the middle marsh.

The animals of the mid-marsh elevations are abundant and rich in species, which can be attributed to dependable moisture, and in part to the availability of food. Algae are everywhere, in pools and under the salt marsh canopy (U.S. Navy 2002). In winter, filamentous green algae dominate the epibenthos, and in summer, filamentous blue-greens form dense tufted mats over the soil and bases of plant stems. The animals that consume these foods include Ephydrid flies, whose larvae occur on decaying plant matter; California horn snails (*Cerithidea californica*); amphipods, and snail (*Assimineia* and *Melampus*). High concentrations of insects, especially water boatmen (*Trichocorixia* spp.), occur in the pools. They feed on the algae and in turn provide food for the California killifish (*Fundulus parvipinnis*), which spawn and develop in these pools (U.S. Navy 2002). A variety of waders and shorebirds forage in the mid-marsh habitat. Common are the willet (*Catoptrophorus semipalmatus*), marbled godwit (*Limos fedoa*),

long-billed curlew (*Numenius americanus*), great blue heron (*Ardea herodias*), snowy egret (*Egretta thula*), and common egret (*Casmerodius albus*), and a few land birds, which include the Belding's savannah sparrow, house finch (*Carpodacus mexicanus*), and meadowlarks (*Sturnella* spp.).

The lower marsh of Mugu Lagoon is probably the most well-studied habitat of the entire system. Horn snails, lined shore crabs (*Pachygrapsus crassipes*), and yellow shore crabs (*Hemigrapsus oregonensis*) are abundant, but their habits are not well known. They feed on the algal mats and detritus and are eaten by the larger marsh birds. No animal, however, better characterizes the lower marsh than the light-footed clapper rail. The rail is described in Section 4.8.

4.7.4 Estuarine Channels and Tidal Creeks

The channel habitats (for example, tidal channels and tidal creeks) are important for a wide variety of organisms, including macroalgae, phytoplankton, invertebrates, fishes, and birds. A large variety of fish-eating birds, including the federal and state endangered California least tern, feed in the deeper-water habitats, and shorebirds probe the sediments of the intertidal zone in these channels and creeks at low tide.

Channels are subjected to a wide range of environmental conditions. Tidal flushing is greatest at and decreases with distance from the mouth; this general gradient in turn influences movement of water, salinity, temperature, nutrients, and concentrations of dissolved gases. Finer sediments are removed by swifter currents, which creates substrates that contain coarser sediments near the mouth than in tidal creeks. Nutrients brought into the estuary by tidal flushing are more readily available to organisms near the mouth. Temperature, salinity, and levels of dissolved oxygen are less variable in areas of deep water than in tidal creeks. These environmental factors influence the composition, distribution, and population dynamics of the channel organisms.

4.7.4.1 Algae

The obvious plants of intertidal and subtidal areas are the macroalgae. Vascular plants such as eelgrass (*Zostera marina*) are absent, perhaps because the area of shallow water is too small or too dynamic for rooted plants to become established. However, large populations of

Enteromorpha spp. and sea lettuce (*Ulva* spp.) develop on the channel bottoms in some localized areas and later float to the water surface. Seasonal distribution patterns are highly variable, but their abundance is usually greatest in spring. Phytoplankton is also variable in species composition and density. Dinoflagellates (for example, *Gymnodinium* spp.), diatoms, filamentous blue-green algae (cyanophytes), and unidentified unicells or “monads” are all present in the water column.

4.7.4.2 Benthic Invertebrates

Mugu Lagoon’s benthic community is dominated by bivalve molluscs, especially the purple clam (*Sanquinolaria nuttalli*), littleneck clam (*Protothaca staminea*), false mya (*Cryptomya californica*), California jackknife clam (*Tagelus californianus*), and bent-nose clam (*Macoma nasuta*). Polychaete worms, gastropod molluscs, and decapod crustaceans were also numerically important. A very important food and common benthic invertebrate of the eastern arm of Mugu Lagoon is the ghost shrimp (*Callinassa californiensis*).

The distributions of infauna are strongly influenced by sediment type. Filter feeders, such as the dominant bivalves, are associated with medium-sized grains because finer sediments contain too little organic material in suspension and because coarser sediments are too unstable. Finer sediments may also clog the filtering mechanisms. Deposit feeders, such as ghost shrimp and certain polychaetes, often occur on finer sediments, which contain higher concentrations of organic carbon and nitrogen, but less dissolved oxygen and are lower in pH (U.S. Navy 2002).

Depth of the water also influences the presence of benthic invertebrates. Size and density tends to increase with increasing tidal depth. Sediment grain size, temperature, salinity, duration of feeding time, and probability of predation also affect survival in this group. Increased availability of food and stability of the substrate also are associated with deeper water.

The dominant macro-invertebrates also occupy a characteristic depth within the sediments. Sand dollars tend to occupy the top few centimeters. Littleneck clams are found within the top 6 centimeters. Ghost shrimp and its obligate commensal, false mya, occur at 0 to 55 centimeters. There is some overlap with the purple clam, which is found at 25 to 55 centimeters. The California jackknife clam burrowed up to 60 centimeters deep (U.S. Navy 2002).

4.7.4.3 Birds

The channels and tidal creeks at Mugu Lagoon are important foraging and resting areas for a variety of bird life such as great blue herons, which prey on fishes in the channel. Shorebirds forage primarily for invertebrates in the sand and mud and in the water column; diving birds prey on fishes; wading birds use both fishes and invertebrates for food, while others feed on vegetation, such as dabbling ducks, or on insects at the surface, such as plovers. Three federal endangered and one California endangered bird species use organisms in the channel for prey. These species include the California least tern, the California brown pelican (*Pelecanus occidentalis californicus*), the light-footed clapper rail, and the Belding's savannah sparrow. Other birds that feed on fishes in the channels are the belted kingfisher (*Megaceryle alcyon*) osprey (*Pandion haliaetus*), and double-crested cormorant (*Phalacrocorax auritus*).

Several birds associated with water that are rare in California can be seen at Mugu Lagoon. These birds include the little blue heron (*Egretta caerulea*), tricolored heron (*Egretta tricolor*), reddish egret (*Egretta rufescens*), and black skimmer (*Rynchops niger*).

Channels and tidal creeks are important foraging habitats for a variety of birds from other habitats. Light-footed clapper rails rely on habitats in the tidal creek and along the edge of the channel for feeding, as do Belding's savannah sparrows.

4.7.5 Non-tidal Salt Marsh

Non-tidal salt marsh at NBVC Point Mugu is dominated by emergent plants and provides habitat for a wide assemblage of animals, including resident and migratory bird species. Large shorebirds feed and rest in this habitat type, although smaller shorebirds are usually absent or are present in limited numbers.

Physiographically, the non-tidal salt marsh appears to be similar in structure to a tidal salt marsh, except that there is no direct conveyance system for tidal waters. Most of this habitat is dominated by large stands of pickleweed (*Salicornia virginica*) and saltgrass (*Distichlis spicata*) interspersed with alkali heath (*Frankenia granifolia*), shoregrass (*Monanthochloe littoralis*), and saltwort (*Batis maritima*), which are important co-dominant plant species. Salt marsh bird's-beak, a federal and state listed endangered species, can be prevalent in this habitat since all of

its host plants are present. The typical pickleweed and saltgrass series (Sawyer and Keeler-Wolf 1995) prevails in this habitat type.

The hydrodynamics of this habitat type are not well understood, however, there appears to be a great influx from freshwater sources, such as the two adjacent duck clubs and from water that ponds on other berms.

4.7.6 Salt Pannes

The salt pannes are upper intertidal areas that are devoid of vegetation. They accumulate winter rainfall, and pond fresh water from the adjacent duck clubs and saline water from high spring tides in December through February. In summer, they are covered by a salt crust that forms with the evaporation of salt spray and tidal water from high spring tides in May through July. Salinities of 200 ppt are common in soils at the end of the dry season. During the winter aquatic phase, algae flourish and aquatic insects become abundant. Waterfowl and shorebirds, and in particular, the western snowy plover, make use of the shallow water for feeding and resting. The habitat appears barren during the summer dry season because most of the resident insects and other arthropods live in the soil. Furthermore, the federal listed threatened western snowy plover locally nests in specific salt pannes in this habitat type at Mugu Lagoon.

Belding's savannah sparrows often forage in the salt pannes, feeding on the insects there. California least terns and western snowy plovers are both known to nest on salt pannes. The latter two species use preformed depressions in the hardpan, such as animal footprints, for nest scrapes. If there are patches of other substrate, such as sand or small wrack, the birds will create their own scrapes. When localized pannes are inundated, western snowy plovers also use them as feeding areas. This use occurs primarily during the early part of the breeding season (late February) and during the fall migration (September and October).

Data for shorebirds in the Mugu Lagoon support the concept that salt pannes provide alternative resting and feeding sites during high tides. Of the 43 shorebird species studied, 28 used the salt panne habitat for feeding (U.S. Navy 2002). Heavy use of these non-tidal areas by waders, sandpipers, and plovers shows that estuarine shorebirds are not restricted to intertidal habitats (U.S. Navy 2002).

4.7.7 Brackish/Freshwater Marsh

Habitat types where the salinity in the water is typically reduced (between 0.5 and 30 ppt) are considered brackish or mixohaline (Cowardin and others 1979). In southern California, these habitats occur next to seepages or where rainfall or runoff is impounded. Water levels fluctuate widely but irregularly. The plants and animals of the salt marsh are generally not found here as a result of the differences in salinity and water levels. Instead, the community is more characteristic of the region's freshwater marshes and freshwater drainage ditches. Cattails (*Typha domingensis*) and bulrushes (*Scirpus californica*) are the usual dominant plants among the emergent species, and the submergent ditchgrass (*Ruppia maritima*) is abundant seasonally. Red-winged blackbirds commonly set up territories in the tall, dense vegetation, and dragonflies (*Odonata anisoptera*) are obvious insect inhabitants.

Brackish marshes at NBVC Point Mugu are found immediately adjacent to roads and passageways, so that the elevation is higher than in the surrounding marsh. Some of the brackish and freshwater marshes have formed in areas where the vast array of the Oxnard Drainage Ditch (ODD) system was constructed. Some of the areas within and adjacent to the ODD system have developed into various small patches of marsh along the drainage ditch, freshwater marsh drainage ditch, riparian and brackish drainage ditch, and riparian drainage ditch.

The function of these brackish habitat types as part of the estuarine ecosystem is under debate. To the west at the Ormond Beach wetlands and to the east at Malibu Creek Lagoon, there is evidence that springs were frequent around the intertidal wetlands, and various restoration plans have called for creation of large areas of fresh-to-brackish marshes (for example, State Coastal Conservancy plans for Orange County wetlands and for restoration of Los Cerritos Wetland). Light-footed clapper rails use both brackish and freshwater marshes and salt marsh habitats at Upper Newport Bay as well as at San Elijo Lagoon. Thus, the proximity of several small, brackish marshes along the periphery of saline marshes may improve conditions for light-footed clapper rails.

Fresh and brackish marshes may function as a general refuge for animals when water is high in the Mugu Lagoon salt marsh estuary. Physiographic habitat types that are derived from brackish and freshwater marsh (that is, the brackish drainage ditch, freshwater marsh drainage

ditch, riparian and brackish drainage ditch, or riparian drainage ditch) are used by estuarine birds, because many species are seen in both localities. Black-crowned night herons (*Nycticorax nycticorax*), black-necked stilts (*Himantopus mexicanus*), American avocets (*Recurvirostra americana*), and snowy egrets (*Egretta thula*) are conspicuous in these habitats.

4.7.8 Transitions/Transition from Upland to Wetland

Transitions are areas where one community type (for example, an upland) shifts to another (for example, to a wetland). The most extensive wetland habitat at Mugu Lagoon is the intertidal salt marsh. Its exact upper boundary is difficult to discern because the vegetation blends into the upland. This transitional area therefore contains elements of both wetland and terrestrial communities. A majority of the peripheral upland acreage has been disturbed at Mugu Lagoon. The wetland plants that occur on the slope are alkali heath, sea lavender (*Limonium californicum*), and sea-blite (*Suaeda esteroa*). The marsh species that grows highest up the slope is saltgrass; alkali heath and sometimes small patches of pickleweed may also be found, depending on the type of disturbances induced by humans. The first occurrences of alkali weed (*Cressa truxillensis*) and alkali heath are additional indicators of the transition from the upland down into the wetland. Some freshwater or brackish water plants may grow in the transition habitat as a result of previous land disturbances and patterns in precipitation runoff. At Mugu Lagoon, these plants include mulefat (*Baccharis salicifolia*) at the highest slopes and yerba mansa (*Anemopsis californica*) at the middle to lower aspects.

4.7.8.1 Plants of the Wetland-Upland Transition

The transition habitat encompasses about 270 acres and occupies a variety of areas throughout Mugu Lagoon. The majority of this habitat type is primarily found in the northern portions of the station. The upland community in this transition area is coastal sage scrub with several other species of shrub, some of which are evergreen (such as the laurel sumac [*Rhus laurina*] and lemonadeberry [*R. integrifolia*]), and some of which are drought-deciduous (such as the golden brush [*Haplopappus venetus*] and California sagebrush [*Artemisia californica*]).

The boundary between upland and wetland plants at Mugu Lagoon is in most cases not well defined in areas closer to the lagoon proper; however, the boundary can be abrupt away from the lagoon. Although many exotic plants have invaded the coastal scrub, few are sufficiently

tolerant of inundation and salt stress to invade the coastal wetlands. One weedy species, the Australian saltbush (*Atriplex semibaccata*), has an extremely wide range of tolerance. It occurs throughout the transition zone and well into the upper salt marsh. The saltbush withstands the dry saline upland as well as occasional inundation by sea water, and thus has been promoted for horticultural uses. Although its light foliage and bright red berries are attractive, further spread of this exotic species is of concern.

4.7.8.2 Animals of the Wetland-Upland Transition

California kingsnakes (*Lampropeltis getulus californiae*) and San Diego gopher snakes (*Pituophis melanoleucus annectens*) are common species in transition habitats. The side-blotched lizard (*Uta stansburiana*) is abundant on dry ground, especially in sandy, open areas.

Two species of small mammals are known to occur in the transition habitat type: the western harvest mouse (*Reithrodonomys*) and deer mouse (*Peromyscus maniculatus*). The latter species was trapped primarily in May and June in the transition habitat. Other mammals that were trapped or observed in the upland habitats included two carnivores, the coyote (*Canis latrans*) and the long-tailed weasel (*Mustela frenata*). The California jackrabbit (*Lepus californicus*), desert cottontail (*Sylvilagus audubonii*), opossum (*Didelphis virginianus*), and California ground squirrel (*Spermophilus beechyi*) have also been observed. It is likely that these larger, highly mobile animals visit the wetland from time to time.

The small mammals are prey for various birds. Of special interest in the transition habitat are the short-eared owl (*Asio Flammeus*), northern harrier, and white-tailed kite (*Elanus caeruleus*).

4.7.9 Mixed Transition Disturbed

As described above, transition habitat types are areas where one community or habitat type (for example, the upland) shifts to another (for example, to a wetland). Mixed transition disturbed habitat is similar in physiognomic structure to the transition habitat. The gradient composition moves from mostly facultative wetland plant species to upland plant species. The wetland plants are primarily composed of salt grass and very small remnant populations of pickleweed, whereas the upland plant species are dominated by invasive exotics, such as mustards (*Poa*

annua), annual grasses (*Polypogon monspeliensis*), iceplant, Australian salt bush, spearscale (*Atriplex triangularis*), and curly dock (*Rumex crispus*).

Mammals trapped or observed in the upland habitats at NBVC Point Mugu included three carnivores: the coyote, feral cats, and the long-tailed weasel. The California jackrabbit, desert cottontail, opossum, California ground squirrel, western harvest mouse, deer mouse, brush mouse (*Peromyscus boylii*), California vole (*Microtus californicus*), house mouse (*Mus musculus*), and house rat (*Rattus rattus*) are the various small mammals that were trapped or observed in mixed transition disturbed habitat during remedial investigations on the base. It is likely that the larger, highly mobile animals visit the wetland from time to time. Traps in the upland captured additional small mammals: kangaroo rat (*Dipodomys* spp.), cactus mouse (*Peromyscus eremicus*), and dusky footed woodrat (*Neotoma fuscipes*).

Birds of the mixed-transition habitat type include a variety such as the turkey vulture (*Cathartes aura*), loggerhead shrikes (*Lanis ludovicianus*), mourning doves (*Zinaida macroura*), corvids (primarily ravens [*Corvus corax*]), and an array of emberizids (*Emberiza*).

4.7.10 Sandy Nest Islands

In 1997, NBVC Point Mugu conducted a time-critical removal action at Installation Restoration Program Site 4, a 12-acre area known as the Public Works Storage Yard that was heavily contaminated with PCBs and metals at levels dangerous to humans, flora, and fauna. This remediation project culminated in the restoration of 12 acres of estuarine wetland that included functional tidal creeks and intertidal mudflats and approximately 8 acres of sandy island. The restoration project also enhanced 29 acres of surrounding estuarine salt marsh. The two sandy islands are large enough to qualify as a separate habitat type because they are not physically located within the beach and dune habitat.

The islands have been managed to lure California least terns as the first occupants of the habitat. About 75 percent of the invasive plants (primarily wild celery [*Umbelliferae* spp.]) were removed before California least terns arrived. Ninety-eight decoys of California least tern and 10 of caspian tern (*Sterna caspia*) were placed on the two islands to attract California least terns to the sandy nesting habitat. California least terns forage in the adjacent new tidal creek and the adjoining drainage ditch habitats. California least terns occupied these islands in 1997 and

nested successfully, with four nests. In 1998, the nest islands yielded eight nests. In 1999, the nest islands yielded 36 California least tern nests. In 2000, the nest islands yielded 31 California least tern nests.

Black skimmers are another unique species found foraging at Mugu Lagoon nearly year-round, although they have not nested. The two man-made sandy nest islands were constructed within 200 feet of the lagoon proper; however, black skimmers have not used them for nesting. It is postulated that black skimmers may fly from nesting areas at the Bolsa Chica wetlands in Orange County or nesting areas in Long Beach in Los Angeles County to Mugu Lagoon for daily foraging forays.

4.7.11 Submerged Aquatic Habitat

The biota of Mugu Lagoon is rich with species including plants, invertebrates, fish, birds, reptiles, amphibians, and mammals. The associations and interactions of all these biotic components and with the physical environment are important. These relationships play an important role in the function and value of the existing estuarine ecosystem. Unfortunately, they have not all been equally or thoroughly studied. In particular, an important component of the Mugu Lagoon ecosystem that is not well understood is the submerged aquatic habitat. This habitat supports many of the species lower in the food chain, including benthic invertebrates and fish, which are an essential food for birds and other animals.

According to NMFS, the entire Mugu Lagoon should be considered Essential Fish Habitat (EFH) and portions of it may be considered Habitat Areas of Particular Concern (HAPCs).

Understanding this environment is an important component in evaluating and managing the function and value of the Mugu Lagoon. Because of the current lack of information on fish habitat at NBVC Point Mugu, the extent of potential EFH within Mugu Lagoon is defined as the combination of habitat areas that are influenced by tides. These areas include intertidal mudflats and sandflats, intertidal salt marsh, tidal creeks, and tidal drainage ditches. After new studies are conducted to characterize the submerged aquatic habitat at NBVC Point Mugu, the map will be updated to reflect the more accurate information that has been collected.

Although current data are limited on the habitat for and fish species present in Mugu Lagoon, past investigations have provided some insight into the submerged aquatic habitat, mainly

within the central basin. In these studies, it was reported that fish were less abundant in the western arm than in the central basin and eastern arm (Onuf 1987). The distribution of the population was attributed to the restriction of tidal exchange in the western part of the lagoon. Fish were sampled in the eastern arm of Mugu Lagoon between 1977 and 1982. Christopher Onuf (19887) reported that 39 species of fish were identified in Mugu Lagoon, with the four most common being small species such as arrow gobies, topsmelt, staghorn sculpin, and shiner surfperch. The only common larger fish identified included sharks, rays, and the shovelnose guitarfish (Onuf 1987). A more recent fish survey conducted from September to November 1993 by Michael Saiki identified 16 species of fishes (Saiki 1997). Fish identified in the Mugu Lagoon during these studies and that may inhabit the Mugu Lagoon currently are presented in Table 4-4.

An important factor that influenced abundance and species diversity of fish was the type of habitat at the sampling locations. Characteristics of the habitat that appeared equally important included the depth and cover by eelgrass (*Zostera marina*). The studies had identified eelgrass as an important type of vegetation present in Mugu Lagoon, and noted that the relationship appeared synergistic between cover by eelgrass and depth for a number of fish species.

Fish appeared to be most abundant in the deep eelgrass and least abundant in shallow, bare sites. Additionally, fish were more diverse at eelgrass sites than at bare sites (Onuf 1987).

Previous studies indicated that fish and the habitat to support them are critical factors that influence the function and value of the ecosystem of Mugu Lagoon. These studies also concluded that decreasing depths and virtual elimination of eelgrass could have a cascading effect on the suitability of various sites for different species. This conclusion suggests that the physical characteristics of Mugu Lagoon, including sedimentation and the tidal regime, also play important roles in the success of fish and the larger estuarine ecosystem.

Table 4-4 Fish Species Found Within Mugu Lagoon

Surveys by Onuf in 1977		Surveys by Saiki in 1993	
Common Name	Scientific Name	Common Name	Scientific Name
Barred sand bass	<i>Paralabrax nebulifer</i>	Arroyo chub	<i>Gila orcutti</i>
Barred surfperch	<i>Amphistichus argenteus</i>	Arrow goby	<i>Clevelandia ios</i>
Bay blenny	<i>Hypsoblennius gentiles</i>	Barred sand bass	<i>Paralabrax nebulifer</i>
Bay pipefish	<i>Syngnathus leptorhynchus</i>	California halibut	<i>Paralichthys californicus</i>
Black surfperch	<i>Embiotoca jacksoni</i>	California killfish	<i>Fundulus parvipinnis</i>
Brown rockfish	<i>Sebastes auriculatus</i>	Common carp	<i>Cyprinus carpio</i>
California halibut	<i>Paralichthys californicus</i>	Diamond turbot	<i>Hypsopsetta guttulata</i>
California killfish	<i>Fundulus parvipinnis</i>	Deepbody anchovy	<i>Anchoa compressa</i>
California tonguefish	<i>Symphurus atricauda</i>	Grey smoothhound shark	<i>Mustelus californicus</i>
Diamond turbot	<i>Hypsopsetta guttulata</i>	Longjaw mudsucker	<i>Gillichthys mirabilis</i>
Giant kelpfish	<i>Heterostichus rostratus</i>	Shiner perch	<i>Cymatogaster aggregata</i>
Grey smoothhound shark	<i>Mustelus californicus</i>	Pacific staghorn sculpin	<i>Leptocottus armatus</i>
Kelp bass	<i>Paralabrax clathratus</i>	Specklefin midshipman	<i>Porichthys myriaster</i>
Kelp rockfish	<i>Sebastes atrovirens</i>	Threadfin shad	<i>Dorosoma petenense</i>
Leopard shark	<i>Triakis semifasciata</i>	Topsmelt	<i>Atherinops affinis</i>
Longjaw mudsucker	<i>Gillichthys mirabilis</i>	Western mosquitofish	<i>Gambusia affinis</i>
Opaleye	<i>Girella nigricans</i>		
Pacific herring	<i>Clupea harengus</i>		
Round stingray	<i>Urolophus halleri</i>		
Shiner surfperch	<i>Cymatogaster aggregata</i>		
Shovelnose guitarfish	<i>Rhinobatos productus</i>		
Speckled sanddab	<i>Citharichthys stigmaeus</i>		
Spotted turbot	<i>Pleuronichthys ritteri</i>		
Staghorn sculpin	<i>Leptocottus armatus</i>		
Starry flounder	<i>Platichthys stellatus</i>		
Striped mullet	<i>Mugil cephalus</i>		
Topsmelt	<i>Atherinops affinis</i>		

4.7.12 Marine Mammals

Marine mammals are protected under the Marine Mammal Protection Act of 1972 (MMPA). Under the MMPA, it is illegal to hunt or harass harbor seals and other marine mammals. Marine mammals are sensitive to the presence of humans adjacent to or in the shoreline habitats. Disturbance can cause them to abandon a site or to injure or abandon pups.

The population of the eastern pacific harbor seal consists of an estimated 285,000 seals, distributed from Alaska to Baja California. Harbor seals favor near-shore coastal waters and frequent isolated sandy beaches, mudflats, offshore rocks, bays, and estuaries. In general, the species seems to prefer protected rather than exposed areas. Suitable characteristics for a haulout site include adequate protection from predators on land, direct access to deep water, proximity to food, and protection from strong wind and waves. Haulout areas for marine mammals are designated Environmentally Sensitive Habitat (ESH) by Ventura County and are protected under the local coastal plan and MMPA.

Pacific harbor seals regularly use several locations within Mugu Lagoon for haulout grounds. Harbor seals use intertidal mudflats within Mugu Lagoon's central basin for resting, molting, and breeding. Some beaches are used as haulout sites for resting; however, use of beaches is very uncommon. Peak counts at Mugu Lagoon have exceeded 325 individuals, representing about 1.2 percent of the seals that haul out along all California shorelines.

Pupping season is approximately early March to the middle of July at Mugu Lagoon. In some cases, however, a few pups were born in December, but not all have survived. Conversely, pups born as late as June have survived. Harbor seal pups are precocious and are almost immediately able to crawl and swim, often within an hour of birth.

They normally remain with their mothers about 1 to 2 months. Then, they are weaned and separate from their mother. After they are weaned, the pups tend to disperse from their birth site, often traveling long distances to explore the new habitat. Harbor seals also haul out during the molting period in the late spring, and smaller numbers haul out at other times of the year.

The harbor seal is a year-round resident at Mugu Lagoon. Like coastal haulout populations farther north, the colony at the entrance to Mugu Lagoon appears to be steadily increasing in

numbers. In the early-to-mid 1980s, fewer than 100 harbor seals were counted there during the molting period of May and June. From 1988 to 1995, from 120 to 243 seals were counted in June during the index tally conducted by CDFG personnel.

4.7.13 Migratory Birds

All bird species present at NBVC Point Mugu, with the exception of three (rock doves, European starlings, and house sparrows), are protected by federal law under the MBTA and EO 13186.

The Migratory Bird Treaty Act (MBTA) (16 USC § 703 *et seq.*) is a federal statute that implements treaties with several countries concerning the conservation and protection of migratory birds. The number of bird species covered by the MBTA is extensive and is listed at 50 CFR § 10.13. Further, the regulatory definition of “migratory bird” is broad and includes any mutation or hybrid of a listed species and includes any part, egg, or nest of such bird. (50 CFR § 10.12.) Migratory birds are not necessarily federally listed endangered or threatened birds under the Endangered Species Act (16 USC § 1531 *et seq.*). The MBTA, which is enforced by the U.S. Fish and Wildlife Service, makes it unlawful “by any means or manner, to pursue, hunt, take, capture [or] kill” any migratory bird except as permitted by regulation.

EO 13186, issued January 10, 2001, requires that federal executive agencies implement a MOU with USFWS, avoid or minimize the negative impacts of agency action on migratory birds and take steps to protect migratory birds and their habitats. DoD is currently developing an MOU with the USFWS; however, in the interim the EO provides that federal agencies are “encouraged to immediately begin implementing the conservation measures” identified in the EO, “as appropriate and practicable.” Deputy Assistant Secretary of the Navy (Installation and Environment) in a January 19, 2001 memorandum to the Chief of Naval Operations and Commandant of the Marine Corps issued guidance on EO compliance. This guidance provides that Navy activities should comply with the “intent” of the EO. NBVC Point Mugu currently implements the following policy regarding MBTA species:

- Provides notice to the USFWS in advance of conducting an action that is intended to take migratory birds, and ensure that environmental analysis of actions required by the NEPA, or other established environmental review processes evaluate the effects of actions and plans on migratory birds.
- Integrates migratory bird conservation principles, measures and practices into installation activities and avoiding or minimizing, to the extent practicable, adverse impacts on migratory birds and migratory bird habitats.

- Identifies unintentional actions that are, or are likely to have, a measurable negative effect on migratory bird populations.
- Develops and implement standards and practices designed to lessen the amount of unintentional takings to the extent practicable and consistent with mission requirements.

Current migratory bird management guidelines include:

- Follow the procedures established in the depredation permit process, including notification of USFWS before an action is undertaken that may result in the take of migratory birds and before reporting annually to USFWS on the numbers of each species taken under the permit.
- Develop and implement principles, standards, and practices designed to lessen the amount of species takes to the extent practicable.
- Ensure that environmental analysis of proposed actions considers migratory birds and their habitat.
- Restore and enhance the habitat of migratory birds as practicable.
- Control the spread and establishment of exotic animals and plants that may affect migratory birds by decreasing the function and value of their habitat.
- Align base management practices with the management goals of Partners-in-Flight, U.S. National Shorebird Plan, North American Waterfowl Management Plan, Council for the Conservation of Migratory Birds, and the North American Colonial Waterbird Plan to the extent practicable.
- Evaluate the potential to introduce standardized and consistent monitoring protocols for waterbirds (see Section 7.3.2).
- Promote research and information exchange related to the conservation of migratory bird resources, such as the multi-organization, Discovery for Recovery headed by the USGS Western Ecological Research Center.

4.8 SPECIAL STATUS LISTED SPECIES AND SPECIES OF SPECIAL CONCERN

Seven federal and state listed species occur at NBVC Point Mugu (Keeney and Ball 1998). They include three federal and state endangered birds, the California least tern, the light-footed clapper rail (*Rallus longirostris levipes*), and the California brown pelican (*Pelicanus occidentalis*); one federal threatened and state sensitive species, the western snowy plover; two state endangered bird species, the Belding's savannah sparrow and the peregrine falcon (*Falco peregrinus anatum*), and one federal and state endangered plant species, the salt marsh bird's-beak. In addition, a fifth federal and state endangered bird, the least Bell's vireo (*Vireo bellii pusillus*), has recently been detected at one location on the base. The federal species are protected under the ESA, and compensatory measures for these species have been developed in the Programmatic BO. The protection and conservation of state listed species, however, is

not coextensive with this obligation to protect and conserve federal listed species. Although there is no federal mandate to protect state listed species, NBVC Point Mugu has decided to act cooperatively with CDFG to protect state threatened and endangered species.

Both federal and state listed species and their status at NBVC Point Mugu are described below and are summarized in Table 4-5.

4.8.1 Salt Marsh Bird's-beak

Once historically found in more than 20 salt marshes from Santa Barbara County to Baja California (Fox 1982), this rare plant is now found in only six locations throughout its former range. As a result of this decline, both USFWS and CDFG currently classify the salt marsh bird's-beak as an endangered plant species.

The plant's germination usually depends on the amount and distribution of fresh water from winter rains. Generally, it germinates at Mugu Lagoon from June to November, with the purplish to pink plants observed from about July through October. On occasion, salt marsh bird's-beak can be found through December and recently into January. The primary distribution is located west of Runway 3 (north-south runway); however, a few remnant populations are located in specific areas east of Runway 3. Through preliminary GIS analysis, it has become clear that the data for the salt marsh bird's-beak in their current state cannot be analyzed as a single set.

Salt marsh bird's-beak is established in habitat that generally forms a "bathtub" ring around the periphery of the salt marsh, usually in high salt marsh or hummock areas. The ecology of the plant is very narrow: (1) it grows on the roots of specific host plants that include saltgrass, shoregrass, and pickleweed; (2) its host pollinators are very specific; (3) it cannot be immersed in salt water for any long duration; (4) it usually needs fresh water to germinate, and (5) the seed wings are dispersed by floating to the marsh edge.

Table 4-5 Special Status Listed Species at Mugu Lagoon as of December 2001

Species Name	Federal	State	NBVC Point Mugu Status
<u>Plants</u>			
Salt marsh bird's-beak <i>Cordylanthus maritimus</i> spp <i>Maritimus</i>	FE	CE	Research and monitoring in progress; population appears stable; 22-year analysis of population distribution and abundance in progress.
<u>Birds</u>			
California brown pelican <i>Pelicanus occidentalis</i> Status – resident Essential Behaviors: roosting; foraging	FE	CE	Monitoring of roosting population is under way; population appears to be increasing during some years. Dramatically changing roosting habitat.
Light-footed clapper rail <i>Rallus longirostris levipes</i> Status – resident Essential Behaviors: breeding, foraging	FE	CE	Demographic population monitoring during nesting season; census by call count and nest search; captive breeding program; population increase from four to seven pairs, plus five advertising males (19 birds).
California least tern <i>Sterna antillarum browni</i> Status – summer resident Essential Behaviors: breeding, foraging	FE	CE	Demographic population monitoring during nesting season; variable population at NBVC Point Mugu; appears to be increasing.
Western snowy plover <i>Charadrius alexandrinus nivosus</i> Status – resident Essential Behaviors: breeding, foraging	FT	CS	Demographic population monitoring; breeding population severely decreasing; winter population may be decreasing as a result of changes in sandy beach habitat, predation, and anthropogenic factors.
Belding's savannah sparrow <i>Passerculus sandwichensis beldingi</i> Status – resident Essential Behaviors: breeding, foraging	Candidate	CE	Territorial male population monitoring every 5 years; song and behavior census; population appears stable.
Peregrine falcon <i>Falco peregrinus</i> Status – resident Essential Behaviors: foraging	Federally Delisted Aug 1999	CE	Population monitoring during the shorebird, wader, raptor census. Up to two birds during spring (mid-June); up to four birds during winter.
Least Bell's vireo <i>Vireo bellii pusillus</i>	FE	CE	Newly discovered species, status unknown.

FE: Federal Endangered; endangered of becoming extinct
 FT: Federal Threatened; threatened with becoming
 endangered

CE: California State Endangered
 CS: California State Sensitive

Most of the populations of salt marsh bird's-beak that appear each spring occur in the western portion of NBVC Point Mugu. The seed bank is believed to be intact in other areas, but physical conditions are not suitable for germination. There is the potential for the species to germinate if freshwater inundation were encouraged. Currently, the distribution appears affected by the influx of fresh water from the adjacent duck hunting clubs to the north. Sheetflow from these fields may help preserve, and perhaps enhance, the population of the salt marsh bird's-beak at NBVC Point Mugu. Suitable habitat appears to be present elsewhere within Mugu Lagoon, such as in the northern area of the central basin, and to a lesser degree at the eastern arm.

4.8.2 California Least Tern

The California least tern is a federally and state endangered migratory bird that breeds in the coastal sandy beach habitat of the California coast. Its habitat has been subject to significant human disturbance and alteration in the past, before the species was listed. The California least tern is a fairly common to common summer resident at NBVC Point Mugu.

The first spring migrants arrive and move through the area about late April. Terns that use the beach for nesting arrive in early to mid-May. The "typical," two-wave nesting population does not inhabit Mugu Lagoon. Eggs are found in nests at most of these sites by late May, with chicks hatching by mid-June. Fledglings emerge by mid-June to early August. The summer resident terns and migrating California least terns have vacated the area and begun their southbound migration by late August to early September.

California least terns nest in three locations at Mugu Lagoon: East Ormond Beach, two man-made nest islands at the Laguna Road Wetland Restoration Site (LAG4), and the western portion of the eastern arm. California least terns have nested in fairly consistent numbers at East Ormond Beach. In 1998, 266 nests were recorded; in 1999, 176 nests were recorded; in 2000, 221 nests were recorded; and in 2001, 199 nests were recorded. It had been suspected that a few California least terns (fewer than two pairs) may have nested on the western portion of the Eastern Arm. However, confirmed nesting (six nests) was not found until the 2001 nesting season. The two sandy nest islands, which total 8 acres, were constructed as part of the time-critical removal action at Site 4 under the Installation Restoration Program at NBVC Point Mugu. These sandy islands are intended as nesting habitat for seabirds in the Laridae family, including California least terns. Construction of these sandy nest islands was completed

in late April 1997. California least terns occupied these islands in 1997 and nested successfully, with four nests. In 1998, the nest islands yielded eight nests. In 1999, the nest islands yielded 36 California least tern nests. In 2000, the nest islands yielded 31 nests. In 2001, the nest islands yielded 41 California least tern nests.

The lagoon represents a relatively secure breeding and foraging site because public access is restricted and because of current Navy management policies. In contrast, many other locations along the southern California coast are not formally protected and remain vulnerable to changes that could result in loss of essential breeding and foraging habitat for the California least tern.

4.8.3 Western Snowy Plover

Western snowy plovers are summer residents with birds from more northern latitudes replacing breeding birds during migration. Consequently, western snowy plovers are present year round in appropriate habitat (sandy beaches and salt pannes) at Mugu Lagoon. However, some western snowy plovers migrate. Evidence that breeding birds from the beaches of Mugu Lagoon move south and are replaced by individuals from more northern latitudes has been obtained from observations of color-banded birds. Nesting begins in mid- to late March, with young still on the beach until late August to early September. Most nesting is completed by late July. The adult males are still caring for the young in late August to early September. During the winter, western snowy plovers have been observed foraging on the open mudflat in the central basin of Mugu Lagoon.

Western snowy plovers nest on barren to sparsely vegetated beaches, dry salt flats in lagoons, barrier beaches, and on dune-backed beaches. Plovers forage on open beaches, tide flats (primarily during the winter), salt flats, and salt ponds at NBVC Point Mugu. Foraging at beaches occurs above and below the mean high water line, where plovers gather food from the sand, kelp, marine mammal carcasses, or low foredune vegetation.

Male western snowy plovers take an active role in incubation as the nesting cycle progresses. The three egg clutches, well camouflaged in pebble-lined nests in depressions, appear mostly in May and July on the eastern arm and the dune-backed beaches of the western arm. Some nesting continues through August. It requires 4 to 5 days for the female to lay all three eggs, with the intervals between eggs averaging about 60 hours. While the female is laying the eggs,

both male and female plovers leave the territory often, with sustained incubation beginning only after the last egg of the clutch is laid. Plover chicks are precocial, leaving the nest within hours after they hatch to search for food. Both parents may attend the brood at first. Broods rarely remain in the nesting territory until the chicks have fledged, however. Western snowy plover chicks require about 4 weeks to fledge. Plovers may re-nest if the nest is lost to disturbance, depending on the severity of the disturbance.

The sandy beaches at NBVC Point Mugu are included in the critical habitat for the western snowy plover. The area is cited in the *Federal Register* as providing both nesting and wintering habitat for western snowy plovers, as well as supporting the primary constituent elements of critical habitat for this species (USFWS 1999). The lagoon represents a relatively secure breeding and foraging site because public access is restricted and because of current Navy management policies. In contrast, many other locations along the southern California coast are not formally protected. Snowy plover therefore remains vulnerable to changes that could result in loss of essential breeding and foraging habitat.

4.8.4 California Brown Pelican

Brown pelicans breed on west Anacapa Island and on Santa Barbara Island. They do not nest at Mugu Lagoon. Instead, pelicans make use of Mugu Lagoon for post-breeding dispersal, roosting day and night, and for foraging. Populations of this federal and state endangered species increase from June through September, with numbers ranging from 600 to 1,200 birds. Brown pelicans are present at Mugu Lagoon year round.

Brown pelicans forage primarily in the eastern arm, central basin, and the easternmost portion of Mugu Lagoon's western arm. Pelicans have been documented to use the old pilings between L Street and M Street south of Building 55 for roosting and preening (Figure 2-10). They have also been documented roosting west of Runway 3, but in small numbers.

Peak numbers of roosting pelicans at Mugu Lagoon occurred in June each year, with a record count of 1,404 birds in 1992. Most roosting at Mugu Lagoon took place on sandbars and mudflats that surround the central basin and mouth of the estuary. Shifts in the configuration of the central basin caused by flooding and erosion of the sandspit changed the roost sites. Pelicans consistently use the lagoon as a night roost, but numbers were higher during the day.

Mugu Lagoon is the largest natural roost site on the mainland coast from San Diego to Point Conception (Keeney 1999).

The lagoon represents a relatively secure roost site because public access is restricted and because of current Navy management policies. In contrast, many other roosts along the southern California coast are not formally protected. They therefore remain vulnerable to changes that could result in loss of essential non-breeding habitat for the California brown pelican.

4.8.5 Light-footed Clapper Rail

The light-footed clapper rail is a rare resident bird, although it inhabits Mugu Lagoon year round. It occupies intertidal salt marsh habitat in restricted, localized areas. The bird usually begins breeding when pairs form around mid-February. Nesting occurs from mid-March to July, with most eggs laid between early April and May. Construction of separate incubation and brood nests for chicks is typical, but may not be the norm for clapper rails at Mugu Lagoon. Young are dispersed by mid- to late July. Hence, breeding or nesting season for the light-footed clapper rail is mid-February to the end of July.

Habitat for light-footed clapper rails at Mugu Lagoon is not the typical cord grass marsh. Instead, most rails at Mugu Lagoon nest in stands of spiny rush and in isolated high marsh areas within hummocks of pickleweed. Light-footed clapper rails forage along the interface of the mudflat and the marsh, along mud banks, and in shallow tidal creeks. At times, rails forage in the high marsh.

Census data for 1996 and 1997 based on call counts indicated a reduced number of pair and kecking males. There were three pairs and three additional males in both 1996 and 1997. The total number of light-footed clapper rails that occupy Mugu Lagoon was estimated to be nine to 10 individual birds. The 1998 call count data enumerated four pairs and five single males, for an adult population of 13 birds. The 1999 call count indicated a breeding population of four pairs and six single males; however, one male fell prey to an immature red-tailed hawk, leaving the population the same as in 1998. The 2000 call count yielded seven pairs and five single males. The 2001 call count yielded 7 pairs and 5 single males.

The light-footed clapper rail has become extremely limited in distribution, almost entirely as a result of the loss of suitable habitat. Contaminants, and particularly pesticides and heavy metals, in Mugu Lagoon may be contributing to the decline in the population of the light-footed clapper rail in otherwise suitable habitat. Recent surveys have shown a contraction or shift in the habitat that is occupied by light-footed clapper rails: suitable and formerly populated habitat remains but is unoccupied by the species (U.S. Navy 1999).

In 1999, the Navy and the California State University at Long Beach, Biological Sciences Department, began to develop the protocol for a captive breeding program for the light-footed clapper rail. Eggs from the Newport Back Bay population were removed, taken to Mugu Lagoon, and planted in the nests of established pairs of light-footed clapper rail. It appears to have been relatively successful for the first year, as the number of nesting light-footed clapper rail at Mugu Lagoon increased in 2000 for the first time in several years. The captive breeding program is now centered at the Chula Vista Nature Center in San Diego County. The Chula Vista Nature Center has four captive breeding pairs used to nurture eggs and or juveniles for future translocation to other populations, including NBVC Point Mugu, in an effort to recover the species.

A population enhancement study was undertaken in 1999 in concert with the captive breeding research effort at Sweetwater Marsh in San Diego County. This study was a part of the Navy's project descriptions and as a compensatory measure under the NBVC Point Mugu ESA Programmatic Biological Consultation. Two light-footed clapper rail eggs from the Newport Back Bay population were translocated to Mugu Lagoon. Both chicks hatched and fledged successfully. Furthermore, it was also determined that light-footed clapper rails will double clutch, that is, will rear two broods in one breeding season. The factor or factors that reduce the breeding numbers of light-footed clapper rails over the last decade are unclear. Low genetic variability and persistent contamination by organochlorides and heavy metals are possible causes.

The lagoon represents a relatively secure breeding and foraging site because public access is restricted and because of current Navy management policies. In contrast, many other locations along the southern California coast are not formally protected. They therefore remain vulnerable to changes that could result in loss of essential breeding and foraging habitat for the light-footed clapper rail.

4.8.6 Belding's Savannah Sparrow

The Belding's savannah sparrow is a California state endangered species. Belding's savannah sparrows are obligate, year-round, common residents of the salt marsh vegetation type of Mugu Lagoon. Belding's savannah sparrows begin the breeding cycle in late December or early January, when the male begins to defend his territory. Nest building begins in mid- to late March, with eggs laid in early April. The first broods hatch in mid-April, and the young fledge within 10 days. Females re-nest and may raise as many as three broods in a season. The nesting season is completed by mid-August, and pauses briefly before the cycle begins again the next year.

Breeding territories are found predominantly in the upper salt marsh, where pickleweed dominates the vegetation. The size of an individual territory can be small; thus, Belding's savannah sparrows can occur in relatively high density. The birds forage throughout the salt marsh and adjacent area, including some beaches. Male Belding's savannah sparrows defend their territories throughout the breeding season, although territorial behavior is most intense early in the season. Territorial defense is exhibited through singing (only males use the primary song), prominent perching within the boundaries of the territory, surveying, and chasing other Belding's savannah sparrows. After the females begin to nest, males sing less frequently, although they continue to defend the territory. Female Belding's savannah sparrows, in contrast, tend to be secretive and inconspicuous throughout the breeding season.

Four statewide censuses of breeding Belding's savannah sparrows have been conducted in California. These tallies found that Mugu Lagoon has consistently supported one of the largest populations in the state, with estimates of breeding pairs increasing overall from 1973 to 1991.

Invasive non-native plants, such as iceplant, proliferate in the same regions of Mugu Lagoon as pickleweed, creating a habitat that is less suitable for the sparrow. The Belding's savannah sparrow establishes relatively small breeding territories in its required habitat. Therefore, it is easily displaced by the disturbance or degradation of even small areas of wetland. Nests within these breeding territories are built on the ground or in the low branches of salt marsh plants (usually above the reach of tidal flooding), making them susceptible to predation by non-native species such as the red fox and feral cats and dogs.

The lagoon represents a relatively secure breeding and foraging site because public access is restricted and because of current Navy management policies. In contrast, many other locations along the southern California coast are not formally protected. They therefore remain vulnerable to changes that could result in loss of essential breeding and foraging habitat for the Belding's savannah sparrow. NBVC Point Mugu's active management of this bird will be directed in large part at preservation of its habitat, as well as wetland restoration projects. Wetlands that contain active nesting sites, along with wetlands that provide suitable pickleweed habitat, will be managed as a high priority.

4.8.7 Peregrine Falcon

Peregrine falcons were formerly widespread in the continental United States; the subspecies American peregrine falcon historically nested from the North American boreal forest south into Mexico. They have suffered severe declines in population, in large part as a result of contamination of the food chain by pesticides. Conservative estimates set the pre-World War II breeding population of the American peregrine falcon in California at 100 pairs. By the mid 1970s, only about 10 breeding pairs were known in California (USFWS 1998). The population (throughout its historical range), including California, has improved in recent years as a result of restrictions on the use of dichlorodiphenyltrichloroethane (DDT) and intensive intervention to augment the natural reproductive range of the species. A conservative estimate of the current population of the falcon in the state is 140 pairs, surpassing the goal for recovery of the subspecies in California.

Mortality factors other than pesticides such as DDT that could affect the population include shooting, falconry, collisions with transmission lines and electrocutions, contaminated prey, and disturbance at nest sites. Peregrines are particularly sensitive to disturbance at the nest site during the breeding season. Human disturbance such as rock climbing, blasting, shooting, timber harvest, road construction, or aerial intrusion can cause peregrines to abandon the nest sites.

The peregrine falcon was recently removed from the Federal List of Endangered and Threatened Wildlife after productivity rates were evaluated; this evaluation indicated that the bird has recovered to numbers above the levels required by four American recovery plans

(USFWS 1998). The most significant factor in recovery of the species has been restrictions on the use organochlorine pesticides. The final rule that removed the peregrine falcon from the endangered species list was published on August 25, 1999 (64 *FR* 46541). Because the species was removed from the list, it was also excluded from evaluation in the Programmatic BO. However, peregrine falcons remain protected under MBTA, and any act that attempts to remove or relocate individuals will require an MBTA permit from USFWS (USFWS 1982). Furthermore, peregrine falcons remain a state listed endangered species.

4.8.8 Least Bell's Vireo

Listed as federally endangered, the least Bell's vireo is a small gray migratory songbird. It is a resident during the spring and summer, migrating south for the fall and winter. Its preferred habitat is dense riparian vegetation dominated by willows (*Salix* spp.), with a lush understory (USMC 1994). The least Bell's vireo is sensitive to changes in riparian vegetation. Because of its secretive behavior, the vireo is more easily detected by its song. Populations are declining as a result of urban and agricultural development, alteration of the habitat, and parasitism of the brood by the brown-headed cowbird. Range-wide control of the brown-headed cowbird (trapping and nest monitoring) has resulted in a nearly 10-fold expansion in the population of the vireo over the last decade. The vireo was listed as federally endangered in 1986 and as state endangered in 1980. Since then, habitat restoration and cowbird trapping programs have helped the vireo recover from near extinction.

The least Bell's vireo is predominantly an insectivore. Nesting for the least Bell's vireo occurs from March 15 to September 30. During the early and middle portion of the nesting season, the birds forage mostly near the nest site, predominantly in willow. Both high and low shrubs are used as the foraging substrate. These birds use non-riparian habitats occasionally and will travel an average of 15 meters to forage.

Only a few observations of the least Bell's vireo have been recorded at NBVC Point Mugu, and limited data are available on use of habitat for nesting and foraging. The species was first observed in May 2001. At that time, a singing male was detected vocally and visually in the riparian stand located on the west side of Runway 21, south of the Channel Islands Air National Guard taxiway at perimeter road. The bird was identified by its song and was observed after a

permitted USFWS biologist played a callback tape. Studies are needed on the importance of NBVC Point Mugu to the continued existence of this species.

4.8.9 Federal Candidate Species and State Species of Special Concern at NBVC Point Mugu

In addition to the eight listed species discussed above, numerous other plants and animals use the Mugu Lagoon and other habitats at NBVC Point Mugu. Tens of thousands of shorebirds visit Mugu Lagoon every year, marine mammals pup on the mudflats, invertebrates and fish live in the lagoon, and the estuarine habitat provides surroundings essential to the survival of all the species. There are no known USFWS plant or animal candidate species; however, there are several plants and animals that CDFG consider species of special concern. The state species of special concern are presented in Table 4-6.

Table 4-6 State Species of Special Concern

Common Name	Scientific Name
Animals	
arroyo chub	<i>Gila orcutti</i>
burrowing owl	<i>Athene cunicularia</i>
Cooper's hawk (nesting)	<i>Accipiter cooperii</i>
double-crested cormorant (rookery site)	<i>Phalacrocorax auritus</i>
prairie falcon (wintering only; nesting)	<i>Falco mexicanus</i>
southern California rufous-crowned sparrow	<i>Aimophila ruficeps canescens</i>
southwestern pond turtle	<i>Clemmys marmorata pallida</i>
tricolored blackbird (wintering only; nesting)	<i>Agelaius tricolor</i>
western snowy plover (nesting)	<i>Charadrius alexandrinus nivosus</i>
yellow warbler* (nesting; migrating)	<i>Dendroica petechia brewsteri</i>
Plants	
Coulter's goldfields	<i>Lasthenia glabrata</i> spp. <i>coulteri</i>
Others (Insects...)	
wandering (saltmarsh) skipper	<i>Panoquina errans</i>
sandy beach tiger beetle	<i>Cicindela hirticollis gravida</i>
globose dune beetle	<i>Coelus globosus</i>
mimic tryonia (California brackishwater snail)	<i>Tyronia imitator</i>

4.9 CULTURAL RESOURCES

NBVC Point Mugu developed a Historic Archaeological Resources Protection Plan (HARP) in February 2001. It was designed to be used by project planners in conjunction with the Environmental Protection Branch at NBVC Point Mugu to provide management consistency and compliance with laws, regulations, and directives on historic preservation. The HARP is the source for most of the information provided in this section

The section includes a brief summary of the human history at Point Mugu and a list of resources eligible for the National Register of Historic Places, archeological resources, and coordination with California historic preservation programs. Additional historic information and details regarding the locations of historic and archeological sites can be found in the HARP (Naval Air Warfare Center 2001).

4.9.1 Human History of the Point Mugu Area

Archaeological evidence indicates that humans have occupied southern California for nearly 15,000 years. The earliest period of occupation is designated the Paleo-Indian Period, characterized by nomadic groups and the use of large, fluted points to hunt megafauna. From 7,500 to 2,500 B.C., human activity included processing seeds and collecting shellfish. Native populations continued to increase from 2,500 to the 1700s, and exploited marine resources with the aid of the plank canoe. The first Euroamerican contact occurred in 1542 when a Spaniard landed at Point Mugu. At that time, Point Mugu was inhabited by a complex society known as the Ventureño Chumash hunter-gatherers, who lived in a large village named *Mu'wu* along the eastern arm of Mugu Lagoon.

After Mexico gained its independence from Spain in 1821, Spanish mission land was subdivided and distributed to Mexican citizens. In 1836, Isabel Yorba obtained a 30,485-acre land grant known as Rancho Guadalasca that contained a large portion of Mugu Lagoon, portions of the Santa Monica Mountains, and the La Jolla Valley. In the late 1860s, a severe drought caused several ranchos along the Ventura coastline to fail, including Rancho Guadalasca.

Land surrounding Point Mugu changed hands several times during the American Period. Development at the lagoon was largely nonexistent until 1910, when Mugu Fish Camp was

established. Additional development for hunting clubs and fishing camps occurred after the Roosevelt Highway was built in the 1920s.

4.9.2 History of NBVC Point Mugu

Point Mugu was first used by military personnel during the early stages of World War II, when the lagoon area became a Navy Seabee training camp. In 1942, the first 5,000-foot Marsden airstrip was built of steel mats north of the lagoon. Primary operations at Point Mugu were related to firing American versions of the German V-1 rocket known as “loons.” Launching facilities were constructed about a mile from the airstrip and just west of Mugu Fish Camp. In 1946, Congress officially authorized Point Mugu as a Naval Air Missile Test Center. Most of the land for the base had been acquired by 1952.

During the early 1950s, the Navy dredged the mouth of Calleguas Creek and used the dredged soils as fill, creating additional space for military facilities and runways. About 1,000 acres of the base’s original surface are now buried under 3 to 12 feet of fill dirt. During construction of the base, the original salt marsh at Mugu Lagoon was dredged and filled. In addition, dredged soil was deposited in the northern part of the facility. Therefore, prehistoric archaeological sites that might exist at NBVC Point Mugu would be obscured by fill.

4.9.3 Prehistoric Resources

An associated prehistoric site (CA-VEN-187/256) has been recorded at NBVC Point Mugu. According to the Draft HARP, CA-VEN-187/256 may be one site (Naval Air Warfare Center 2001). The eligibility of CA-VEN-187/256 for the National Register has not been determined; however, based on additional information discovered in 1999, it is probable that it will be deemed eligible when the final report is submitted.

4.9.4 Historic Resources

Mugu Fish Camp (CA-VEN-1239) is the only historic archaeological resource recorded on NBVC Point Mugu that is eligible for the National Register. Portions of the site that are in danger of loss to erosion were excavated in 1996. The remaining portion is under asphalt.

4.9.5 Architectural Resources

Nine buildings or structures have been deemed eligible for the National Register at Point Mugu. Of these, four are currently scheduled for demolition, and one is frequently remodeled. These buildings are: Building 55 (primary missile launch platform), Buildings 727, 728 and 729 (part of the Baker Launch Complex), and Building 36 (Test and Evaluation Center).

4.9.6 Native American Resources

No Native American traditional cultural properties have been identified on NBVC Point Mugu.

4.9.7 Paleontological Resources

No fossiliferous stratum is exposed as surficial geology within NBVC Point Mugu.

4.9.8 Coordination with Other Government Agencies

NBVC Point Mugu will established a programmatic agreement with the California State Historical Preservation Office in compliance with the Advisory Council on Historic Preservation regulations that implement the National Historic Preservation Act (36 CFR 800). The programmatic agreement will be used as a tool for establishing compliance with the Section 106 review process under the National Historic Preservation Act.

4.10 PROTECTION OF CHILDREN

A growing body of scientific knowledge indicates that children may suffer disproportionately from environmental health risks. The Navy has made it a high priority to identify and assess environmental health and safety risks through Executive Order 13045 (Protection of Children from Environmental Health Risks and Safety Risks). Children are sometimes present at Navy installations as residents and visitors. On these occasions, the Navy has taken precautions for their safety using a number of means such as fencing, limitations on access to certain areas, and adult supervision. Unescorted children are not allowed anywhere at NBVC Point Mugu at any time.

4.11 ENVIRONMENTAL JUSTICE

A NEPA evaluation of a proposed action must include an assessment of effects on minority and low-income populations. In addition, an alternative location or action must be considered if the proposed action discriminate against a minority or low-income population in accordance with Executive Order 12898.

Based on the 2000 Census (U.S. Bureau of the Census 2001), the majority of the population (69.9 percent) in Ventura County indicated race as White in the 2000 Census. Other races represented by Ventura County population include Asian (5.3 percent), Filipino (2.1 percent), black or African American (1.9 percent), with other races or a combination of two or more races make up the remaining population (U.S. Bureau of the Census 2001). Approximately 33.4 percent of the population in Ventura County indicated Hispanic or Latino origin, which can be any race.

4.12 HAZARDOUS AND TOXIC MATERIALS/WASTES

Hazardous materials are substances that, because of their quantity, concentration, or physical, chemical, or infectious characteristics, may present a substantial danger to public health or the environment if released. These materials are specifically defined by certain laws. For this document, substances identified as hazardous in the Occupation Safety and Health Act are considered hazardous materials. Examples of hazardous materials used at NBVC Point Mugu are fuels, oils, cleaning solvents, paints and thinners, pesticides, and batteries.

Most of the hazardous material managed at NBVC Point Mugu is fuel. The following management plans are in place at NBVC Point Mugu to prevent or mitigate releases of hazardous materials to the environment: an Oil Spill Prevention, Control, and Countermeasure Plan; a Pollution Prevention Plan; a Spill Contingency Plan; a Hazardous Waste Management Plan; a Storm Water Pollution Prevention Plan; and a Solid Waste Management Plan (TtEMI 2001b).

The use of hazardous materials can, in turn, create hazardous wastes. Hazardous wastes, as defined for this document, include substances identified by the Resource Conservation and Recovery Act (RCRA), Comprehensive Environmental Response, Compensation, and Liability

Act (CERCLA), Superfund Amendments and Reauthorization Act (SARA), and subsequent amendments. These substances would include, for example, used solvent or paint wastes. Management of hazardous wastes consists of collection, storage, transportation, and disposal as required by RCRA and California Environmental Protection Agency requirements.

SECTION 5.0 ENVIRONMENTAL CONSEQUENCES

This section discusses the potential for significant impacts to the human environment that could result from implementation of the proposed action or the no action alternative. A discussion is provided for each of the environmental and socioeconomic resource areas that are described in Section 4.

As defined in 40 CFR Part 1508.14, the human environment is interpreted to include natural and physical resources and their relationship with people. Accordingly, this analysis of the project has focused on identifying the types of impact and estimating their potential significance.

5.1 LOCATION

If the proposed action or no action alternative would change the location or substantially alter the configuration of the affected environment, it could have an effect on the location of NBVC Point Mugu.

5.1.1 Potential Impacts of the Proposed Action

The proposed action would occur on NBVC Point Mugu (Figure 1-2). No additional land acquisition or loss of land is necessary to accommodate the objectives of the proposed action. No expansion of personnel would be required. The proposed action would likely result in evaluation of the distribution of sediment load transported to and within the Mugu Lagoon. Other recommended studies would evaluate erosional effects of the Submarine Canyon. Results of predictive models might provide information useful to enable some Navy control over the location and configuration of the inlet and eastern and western arms of Mugu Lagoon. This control would result in a beneficial impact to the affected environment. There would be no adverse impacts to the location of NBVC Point Mugu that would result from the proposed action.

5.1.2 Potential Impacts of the No Action Alternative

Under the no action alternative, no additional land acquisition or loss of land to NBVC Point Mugu would be required. There would be no adverse or beneficial impacts to the location of NBVC Point Mugu that would result from the no action alternative.

5.2 LAND USE

The following factors were used to analyze potential land use impacts: adopted plans and goals of NBVC Point Mugu, the present or planned land use of an area, proposed development, visual resources, and the complexity of the landscape and skyline when viewed from points that are readily accessible by the public.

5.2.1 Potential Impacts of the Proposed Action

The proposed action would not result in a significant adverse change in land use, as described in Section 4.2. Changes in land use expected from the proposed action include:

- The proposed action would further the military mission at NBVC Point Mugu (Section 4.2) by increasing the numbers and health of listed species populations. This would allow the Navy to continue military activities without jeopardizing the health of a species population. Enhancing the Navy's ability to further its military mission would be a beneficial impact to land use.
- The proposed action includes removal of an asphalt parking lot at Holiday Beach to restore sandy areas as nesting habitat for the snowy plover (Figure 1-1). This action would have no impact to current land use because the parking lot has been closed for 2 years with no plans for reopening the lot.
- Catapult berms in the area of Pad Alpha (Figure 1-1) would be removed to restore habitat for the snowy plover under the Programmatic Biological Opinion. According to the NBVC Point Mugu Public Works Planning Branch, no activities are planned for Pad Alpha. This project would not be an adverse impact on land use.
- Expansion and maintenance of recreational facilities at NBVC Point Mugu would benefit recreational land use for local military and civilian personnel.
- Changes in the location, outdoor opportunities, and management of the campground shown in Figure 4-6 would result in both minor beneficial and adverse impacts to recreational land use. These changes include relocation of the campground westward toward Laguna Road (Figure 4-6), upgrading an existing nearby nature trail (beneficial impact), installing interpretive signs about wildlife and geology (beneficial impact), establishing a capacity cap for the campground (beneficial impact), and assessing fees (adverse impact).
- Placement of signage that outlines fishing regulations, catch limits, and general safety information to assist the state in enforcing fishing regulations would result in a beneficial impact to recreational land use.

- Land used for hunting is shown in Figure 1-1 and described in Section 4.2.4.1. Adding stops to the hunting blinds along the runways to prevent hunters from firing toward the runways would have no impact on recreation and a beneficial impact to operation safety.
- Wildlife viewing and educational opportunities are described in Section 4.2.4.2. Construction of an interpretation center at Mugu Lagoon by the National Park Service would have a beneficial impact to recreational land use at property adjacent to NBVC Point Mugu and would expand the public's enjoyment and understanding of the installation's natural resources.

All proposed activities would support the military mission and would not require additional personnel. Proposed activities would be in accordance with NBVC Point Mugu land use plans. Landscape visual resources and building architecture of the NBVC Point Mugu study area would not change from existing conditions as a result of the proposed action. Property ownership would remain the same. The proposed action would not expose sensitive receptors to noise or contamination in air that exceeds existing conditions, so that adjacent land values would not be affected. Some impacts to land use within the study area or land values adjacent to the study area would be beneficial and some would be adverse but not significant.

5.2.2 Potential Impacts of the No Action Alternative

Implementation of the no action alternative would also result in removal of the asphalt parking area at Holiday Beach and the catapult berms at Pad Alpha. These activities would be required under the Programmatic Biological Opinion issued by USFWS. These activities would result in the same impacts as those under the proposed action. No other land use changes are planned under existing conditions.

5.3 AIR QUALITY AND NOISE

This section evaluates expected impacts to air quality from the proposed action and alternative.

This section also evaluates impacts from noise resulting from the proposed action and no action alternative. Impacts are a function of the magnitude of the noise levels that would be generated by the proposed action that would be in excess of, or less than, noise currently generated. The basis for determining an impact from noise is primarily the difference between the baseline noise environment and any changes. An appreciable increase in the existing noise levels in the study areas would be perceived as an annoyance impact.

5.3.1 Potential Impacts of the Proposed Action

The proposed action would not result in activities that would affect existing air quality, described in Section 4.3.1. All current air emissions in the affected environment would continue at existing levels. Pursuant to Section 176(c) of the Clean Air Act, as amended by the 1990 amendments; the General Conformity Rule at 40 CFR Parts 51 and 93; and the Chief of Naval Operations Draft Interim Guidance on Compliance with the Clean Air Act Conformity Rule (CNO Guidance), the Department of Navy (DON) determined that the activities as outlined in the proposed Integrated Natural Resources Management Plan (INRMP) are exempt from conformity requirements in accordance with sections 40 CFR 93.153 (c) (2) (iv), (vii), (x), (xii), and (xiii) and the corresponding sections of the CNO Guidance as described in Section 4.33. The proposed INRMP outlines many routine maintenance activities that would result in no emission increase or an increase that is clearly *de minimis*. Weed control and new construction activities, such as new interpretive trails, are also expected to be *de minimis*, however, specific analysis would be performed to verify that emissions do not exceed *de minimis* levels when specific actions are proposed. Consequently, the proposed action is exempt from the conformity determination requirements of the Environmental Protection Agency's conformity rule. A Record of Non-Applicability (RONA) has been prepared which satisfies the requirement of the CAA General Conformity Rule described under Section 4.3.3. The NBVC Point Mugu RONA is provided in Appendix C.

Implementation of the proposed INRMP would provide additional means for the NBVC Point Mugu Natural Resource Management program to notify pilots of Navy guidelines for use of airspace during landing and takeoff. Navy guidelines currently specify minimum height distances for takeoff and landing trajectories to mitigate impacts to sensitive wildlife. Pilots occasionally disregard these guidelines, which results in existing noise impacts at NBVC Point Mugu, as described in Section 4.3.3.2. Implementation of the INRMP could potentially reduce the number of low-angle takeoffs, thereby resulting in a potential decrease in noise at the ground level.

5.3.2 POTENTIAL IMPACTS FROM THE NO ACTION ALTERNATIVE

The no action alternative would be expected to result in no adverse or beneficial impacts to air quality at NBVC Point Mugu. All current air emissions in the affected environment would continue at existing levels. Under the no action alternative, noise from air operations would likely continue at the same frequency and intensity. There would be no significant reduction in noise under the no action alternative.

5.4 GEOLOGY AND SOILS

An alternative could have an impact on geology or soils if it would result in an increased geologic hazard or a change in the availability of a geologic or soils resource. These geologic and soil hazards include seismic vibration, land subsidence, and slope instability.

5.4.1 Potential Impacts of the Proposed Action

Adverse impacts to mining and to paleontologic and soil resources would not be expected as a result of the proposed action. NBVC Point Mugu overlies 40,000 feet of Pleistocene and Quaternary alluvium. No economic minerals or paleontological resources are likely to be present in the recent sedimentary strata at NBVC Point Mugu (Section 4.4). The proposed action includes no construction projects that would require mitigation measures for earthquake hazard (California Department of Conservation 2001). The proposed action includes preparation of a plan to develop land management practices to control and prevent soil erosion and to implement soil conservation measures (Table 2-1). Development and implementation of a soil conservation plan would have a beneficial impact on soil and surface water resources by reducing erosion and sediment contributions to waterways.

5.4.2 Potential Impacts of the No Action Alternative

The no action alternative does not include planned implementation of a soil conservation plan. However, the existing installation-wide storm water pollution prevention plan addresses on-base erosion control. No adverse impacts to geology and soils resources on base are predicted under the no action alternative.

5.5 WATER RESOURCES

Water is a finite but renewable resource; its quality can be degraded by dissolved contaminants and sediment loading and can be altered by physical disturbances that change the hydrology of the area. No impact would result if no measurable change would occur. A beneficial impact would result from an improvement in water quality or quantity by decreasing contaminant levels, increasing groundwater recharge, or decreasing the potential for future contamination.

5.5.1 Potential Impacts from the Proposed Action

The proposed action contains no activities that would impair water quality, quantity, or water rights, or that would increase the flood hazard at NBVC Point Mugu. Several activities proposed in the INRMP would result in beneficial impacts to water resources. Those activities are summarized in Table 2-1 and are listed below.

- The proposed action includes undertaking a tidal influx study which would evaluate the use of existing culverts that discharge storm water and control tidal influx. These culverts and their current role in the Mugu Lagoon are described in Section 4.5.2.1. The tidal influx study would also evaluate the means to decrease the risk of flood hazard to base infrastructure. The findings of this study could result in beneficial impacts by enhancing the understanding of means to manage tidal influx to improve habitat and reduce flood hazard.
- The proposed action includes participation in the Calleguas Creek Watershed Task Force. Participation would enable NBVC Point Mugu Natural Resources Management personnel to have a voice in regional ecosystem management. This activity would likely result in improved water quality in Calleguas Creek through improved quality of agricultural return flows described in Section 4.5.1.1 and reduced sedimentation (Section 4.5.2.1).
- Update the Integrated Pest Management Plan. This activity would likely result in a decrease of toxic chemicals in surface water at NBVC Point Mugu.
- Prepare a non-point source pollution prevention plan that would identify best management practices for activities at NBVC Point Mugu that accelerate erosion, thus reducing sediment load to surface water.

Groundwater would not be adversely affected by the proposed action. Near-surface groundwater at NBVC Point Mugu is from the Semi-Perched Aquifer, which yields poor-quality water that contains unpotable concentrations of total dissolved solids as described in Section

4.5.3. No activities proposed in the INRMP would be expected to impair or enhance the quantity or quality of groundwater resources.

5.5.2 Potential Impacts from the No Action Alternative

Under the no action alternative, some beneficial activities described in the proposed action may or may not occur. No plan is currently in place to ensure the development of a tidal influx study or increased participation with other watershed users. The existing Integrated Pest Management Plan would be updated and on-base nonpoint source pollution prevention would be addressed under existing programs. Implementation of the no action alternative would not result in adverse impacts to water resources.

5.6 SPECIAL AQUATIC SITES (SAS)

Impacts to SAS could occur if activities associated with the proposed action or no action alternative resulted in altered hydrologic flow, drainage of sediment or contaminants into surface waters or wetlands areas, or actual filling or destruction of a wetland.

5.6.1 Potential Impacts from the Proposed Action

Jurisdictional SAS at NBVC Point Mugu are described in Section 4.6.1 and shown on Figure 4-9. The proposed action includes no activities that would adversely affect SAS at NBVC Point Mugu. Several activities proposed in the INRMP would result in beneficial impacts to SAS. Those activities are summarized in Table 2-1 and are listed below.

- Seven wetland restoration projects described in Section 4.6.2 would result in repair or enhancement of 9 acres of jurisdictional wetlands.
- Participation in the Calleguas Creek Watershed Task Force would enable NBVC Point Mugu Natural Resources Management personnel to participate in regional ecosystem management that is likely to result in improved water quality in wetlands.
- An update the Integrated Pest Management Plan would likely result in a decrease of toxic chemicals contributed to wetlands by the use of pesticides.
- A non-point source pollution prevention plan. The plan would identify best management practices for activities at NBVC Point Mugu that accelerate erosion, thus reducing sediment load to wetlands areas.

5.6.2 Potential Impacts from the No Action Alternative

Under the no action alternative, the wetland restoration projects described under Section 4.6.2 would take place. However, a base-wide coordinated and planned effort to preserve and enhance the extensive SAS resources at NBVC Point Mugu would not occur. As a result, the no action alternative could result in adverse impacts to SAS resources.

5.7 BIOLOGICAL RESOURCES BY HABITAT TYPE

Biological resources (vegetation, wildlife and associated habitat) are evaluated in this section for significantly adverse, adverse and beneficial impacts from the proposed action and no action alternative. The significance of an impact to biological resources depends on the importance of the resource and the proportion of the resource that could be affected compared with its occurrence in the area. Loss of cover and soil characteristics for plant production, population loss of special status plant species, degradation of wetlands or riparian areas, new or enlarged infestations of noxious weeds would all be considered impacts to biological resources. Impacts to wildlife are considered significant if activities affect a biologically important resource or persist over the long-term. An increase in population in response to an enhanced habitat, or the increased viability of a species, could be considered a beneficial impact.

Twelve biological habitats have been delineated at NBVC Point Mugu. These are described in Section 4.7 and shown on Figure 4-10. Habitat type is based on dominant plant species the interrelationship between flora and fauna within each habitat community. A full species list is provided in Appendix B. The most prominent combination of habitats at NBVC Point Mugu is associated with Mugu Lagoon, a 2,500-acre estuarine coastal salt marsh that provides food, nesting, sheltering, breeding, and nursery habitat for numerous benthic invertebrate, fish, bird, and plant species. These habitat types are composed of intertidal mudflats and sandflats, intertidal salt marsh, tidal creeks, and salt pannes. Other habitats found on NBVC Point Mugu include beach and dunes, drainage ditches, transition disturbed, and developed areas.

5.7.1 Potential Impacts from the Proposed Action

The purpose of the proposed INRMP is to protect and enhance wildlife habitat and wildlife at NBVC Point Mugu. The proposed action includes no activities that would adversely affect biological resources at NBVC Point Mugu. While most of the proposed activities are designed to specifically benefit special status listed species, most of the activities also benefit general biological resources at NBVC Point Mugu. Impacts to general biological resources in terms of habitat communities described under Section 4.7 are described in this section. Impacts from the proposed action specific to special status listed species are described in section 5.8.1.

- The eradication of nonnative plants (giant reed and iceplant, for example) would benefit vegetation resources at NBVC Point Mugu by eliminating plants that compete with native plants for space and survival.
- The preparation and implementation of a Jet Assisted Take-off (JATO) Bottle Removal Plan would remove JATO bottles from wetland areas and result in a beneficial impact to wetland habitat at NBVC Point Mugu.
- Seven special aquatic site wetland restoration projects (Section 4.6.2) would improve wetland function and value and provide a beneficial impact to wetland habitat at NBVC Point Mugu.
- The proposed study of submerged aquatic habitat and essential fish habitat would identify characteristics of the submerged aquatic environment. This activity would provide planning and management baseline information to NBVC Point Mugu and benefit fish resources.
- The proposed fisheries surveys would provide planning data on populations of fish in Mugu Lagoon that would enable NBVC Point Mugu to develop effective management of the fish. This would result in a beneficial impact to fish resources.
- The preparation and implementation of a Bat Management Plan would create a systematic means for studying, monitoring, and controlling bat populations and offers a way to educate Base residents and workers on bats. This would be a beneficial impact to wildlife.
- Application for membership in the Western Hemispheric Shorebird Reserve Network (WHSRN). Because the Mugu Lagoon is a critical stopover for migratory birds and provides habitat for thousands of shorebirds, NBVC Point Mugu is a good candidate for membership. Designation as a WHSRN member could provide an avenue for international recognition and funding. Increased funding would be a beneficial impact to bird resources.
- The preparation and implementation of a Soil Conservation Plan/Erosion Control Plan would help to preserve natural resources by conducting surveys and implementing soil

conservation measures. This would likely result in a beneficial impact to aquatic habitat sites through decreased sediment load to surface water.

- The proposed tidal influx study of the hydrology of the Mugu Lagoon and potential affect of increased tidal influx would provide NBVC Point Mugu with the information necessary to understand flux in the Mugu Lagoon physical characteristics such as salinity and water temperature. This would benefit lagoon habitat areas by providing NBVC Point Mugu with natural resource planning information.
- Participation in the Calleguas Creek Watershed and Ormond Beach Task Force would provide NBVC with a better understanding of the effects of activities upstream and adjacent to the ecosystem of Mugu Lagoon and a voice in basin-wide decisions that could affect the quality of surface water discharging to the lagoon. This would be a beneficial impact to the aquatic habitat areas at NBVC Point Mugu by increasing the likelihood of improved water quality.
- The proposed study of the submarine canyon would provide NBVC Point Mugu with information regarding the timing and nature of erosion in the submarine canyon and ultimate breakthrough of the beach barrier. Because migration of the canyon could cause direct intrusion of the Pacific Ocean into the Mugu Lagoon, an understanding of the processes at work and potential mitigation measures would benefit habitat resources at NBVC Point Mugu.
- Completion of a second generation Geographic Information System (GIS) Habitat Type Classification Map would provide natural resource planners at Mugu Lagoon with updated habitat information at a scale that provides more detail. This would benefit habitat resources at NBVC Point Mugu by assisting in planning efforts.
- Updating and implementing the Integrated Pest Management Plan would benefit vegetation and wildlife resources by reducing the amount of toxic pesticides introduced to habitat areas.
- Updating the Storm Water Pollution Prevention Plan to include identification of non-point source pollution at NBVC Point Mugu would benefit aquatic habitat resources by reducing sediment and chemical loading in surface water.
- Update the Bird Air Strike Hazard (BASH) Plan and integrate the Plan with the INRMP. Developing procedures to reduce the number of bird air strikes would be a beneficial impact to bird resources.
- Establishing an experimental Ventura Marsh Milk Vetch population would increase the population of, and benefit non-ESA vegetation resources at NBVC Point Mugu.
- The installation of spike strips on all plastic or metal signage, and equipment within and outside the primary surface area of the airfield on buildings, power poles, fences, and vertical gates would prevent birds from perching on elevated equipment. This decrease in perching locations for migrating and foraging birds would benefit bird resources by reducing the BASH hazard.

- The installation of bird-deterrence devices near airfields would also benefit bird resources by reducing the BASH hazard. Proposed devices include: whirlybirds on all tall structures and stainless wire on approach light pier, Bird Barrier™ products (StealthNet, Bird-Flite, Bird-Coil, Bird-Shock, Birdwire, or Daddi Long Legs) on all tall structures, including buildings, poles, fencing, as needed.
- Conducting a Hazard Risk Assessment to study bird hazards and the relationship between bird habits and aircraft operations would reduce the BASH hazard and beneficially impact bird resources.
- Implementation of BIRD RAD to collect data on the presence of birds in airspace and migratory patterns of diurnal and nocturnal birds would increase the ability of air operations to detect and avoid BASH incidents and beneficially impact bird resources.
- Modification of the grounds maintenance contract to include mowing to maintain infields and approach zones at 7 inches to 14 inches on a monthly basis, cutting and scraping shrubs within a 150-foot buffer zone, altering flight times to include down time 30 minutes before and after sunset, and reducing the presence of tree perches would reduce the BASH hazard resulting in a beneficial impact to bird resources.
- Proposed use of satellite telemetry for waterfowl movement would increase the understanding of the migration habits of waterfowl, thereby allowing the Navy to adjust air operations to reduce BASH incidents. This would result in a beneficial impact to bird resources.
- The creation of a natural resources orientation program for new personnel at NBVC Point Mugu would foster greater appreciation of natural resources among personnel and reduce demands on natural resources staff to provide information about Base resources. This would benefit biological resources at NBVC Point Mugu by decreasing risk of inappropriate human encounters with vegetation and wildlife and increasing the time the natural resources staff have to further habitat protection and enhancement.
- Relocating the campground near the beach area and lagoon farther west and establishing a capacity cap for campsites would benefit biological resources by providing more protection to natural resources at NBVC Point Mugu.

5.7.2 Potential Impacts from the No Action Alternative

Under the no action alternative, management of biological resources could be limited to short-term responses to individual federal and state requirements for resource management at NBVC Point Mugu. Because long-term management plans (longer than 1 year) for biological resources would not be outlined in an INRMP, they might not occur or may not be integrated with all tenant missions at NBVC Point Mugu or with all stakeholder agencies. As a result, several of the projects described in the proposed action may not occur at all, may occur to a lesser extent than is planned under the INRMP, or may occur later than is scheduled under the INRMP.

Because the no action alternative envisions adherence with all local, state, and federal natural resources management requirements, no significant impacts to biological resources are anticipated from the no action alternative. The following activities would take place under the no action alternative. The impacts from these activities are described in Section 5.7.1.

- The eradication of nonnative plant species
- The preparation and implementation of a Jet Assisted Take-off (JATO) Bottle Removal Plan would remove JATO bottles from wetland areas
- Seven special aquatic site wetland restoration projects (Section 4.6.2)

Because the no action alternative includes adherence to all requisite local, state and federal natural resource requirements, many activities described in the proposed action are likely to take place. The activities listed below would enable NBVC Point Mugu to comply with the natural resource requirements listed for each activity in Table 2-1. However these activities are not required specifically by the referenced laws and regulations. They may or may not occur, or may be conducted at a slower pace or to a lesser extent than under the proposed INRMP.

- A submerged aquatic habitat and essential fish habitat study
- Fisheries surveys
- Preparation and implementation of a Bat Management Plan
- Membership in the Western Hemispheric Shorebird Reserve
- Preparation and implementation of a Soil Conservation Plan/Erosion Control Plan
- A tidal influx study of the hydrology of the Mugu Lagoon
- Participation in the Calleguas Creek Watershed and Ormond Beach Task Force
- A study of the submarine canyon
- Completion of a second generation Geographic Information System (GIS) Habitat Type Classification Map
- Updating and implementing the Integrated Pest Management
- Updating the Storm Water Pollution Prevention Plan to include identification of non-point source pollution
- Update the Bird Air Strike Hazard (BASH) Plan
- Establishing an experimental Ventura Marsh Milk Vetch population
- The installation of bird-deterrence devices near airfields
- Conducting a Hazard Risk Assessment to study bird hazards
- Implementation of BIRD RAD

- Modification of the grounds maintenance contract to include mowing to maintain infields and approach zones at 7 inches to 14 inches
- Use of satellite telemetry for waterfowl movement
- The creation of a natural resources orientation program for new personnel at NBVC Point Mugu
- Relocating the campground near the beach area and lagoon farther west and establishing a capacity cap for camp sites

5.8 SPECIAL STATUS LISTED SPECIES

Seven federal and state listed species occur at NBVC Point Mugu (Keeney and Ball 1998). They include three federal and state endangered birds, the California least tern, the light-footed clapper rail, and the brown pelican; one federal threatened and state sensitive species, the western snowy plover; two state endangered birds, the Belding's savannah sparrow and the peregrine falcon; and one federal and state endangered plant species, the salt marsh bird's-beak. In addition, a fifth federal and state endangered bird, the least Bell's vireo, has recently been detected at one location on base. These species and their status at NBVC Point Mugu are described in Section 4.8 and summarized in Table 4-5.

Special status plants and animals are evaluated in this section for significantly adverse, adverse and beneficial impacts. A special status listed species would be considered affected by an activity if the viability of protected animal species were jeopardized with little likelihood that they could be re-established after the action is completed. A lesser impact could result if the disturbed population could be reestablished to its original state and condition, or if the population were sufficiently large or resilient to respond to the action without a measurable change. The significance of an impact depends on the importance of the resource and the proportion of the resource that could be affected compared with its occurrence in the vicinity. An increase in population in response to an enhanced habitat or the increased viability of a species could be considered a beneficial impact.

5.8.1 Potential Impacts from the Proposed Action

The purpose of the proposed INRMP is to protect and enhance wildlife habitat and wildlife at NBVC Point Mugu with a special emphasis on special status listed species. The proposed action includes no activities that would adversely affect special status listed species at NBVC

Point Mugu. Impacts to general biological resources in terms of habitat communities described under Section 4.7 are described in this section. All impacts to biological resources from the proposed action described in Section 5.7.1 also apply to special status listed species. Impacts from the proposed action specific to special status listed species are described in this section.

- The proposed annual population monitoring of special status listed species would be designed to monitor the demographic population status of listed species at NBVC Point Mugu and to ensure compliance with the Endangered Species Act (ESA) and the Programmatic Biological Opinion. This would benefit special status listed species by tracking problem and successful areas for improved management and increased population viability.
- The installation of signs and fencing to restrict access to areas occupied by listed species would restrict access to areas occupied by listed species and fitted appropriately to discourage perching by predatory birds. These activities would benefit special status listed species by reducing harmful human and predatory bird encounters.
- Implementation of a Light-footed clapper rail captive breeding and enhancement program would provide a beneficial impact to bird resources through the recovery of the clapper rail (juvenile and egg translocation).
- The removal of the Holiday Beach asphalt parking lot for the western revetment seawall repair project would restore sandy areas and benefit special status bird resources by creating additional nesting habitat for the western snowy plover.
- The proposed Pad Alpha I habitat restoration project would remove all catapult berms in the area and restore the habitat to sandy beach providing a beneficial impact for the western snowy plover.
- The proposed Pad Alpha II habitat restoration project would beneficially impact western snowy plover and light-footed clapper rail by restoring habitat. Under Pad Alpha II, all structures would be removed and the area restored to sandy beach and spiny rush habitat.
- Implementation of a predator management plan to help implement conservative and selective control of nonnative and native predators that pose a threat to threatened and endangered species. This would beneficially impact special status listed species by reducing risk of loss to predators.
- Restoration and enhancement of the South J light-footed clapper rail by removal of asphalt road and earthen berms at South J and restoration of spiny rush habitat for the clapper rail. This would benefit special status bird resources.
- Removal or relocation of utilities underground within endangered species habitat would protect and benefit species from flying into utility lines and would also guard species on the ground from predation by preventing the use of above ground lines and poles as perches.

- Restoration of Eastern arm snowy plover by cleaning up the debris and replenishing sand would benefit special status bird species by increasing prime nesting habitat for the western snowy plover.
- Proposed coyote studies to investigate the ecological role of coyotes at NBVC Point Mugu and evaluate the potential ecological effects of a coyote control as a part of the predator management program under the Programmatic Biological Opinion. This would benefit listed species by reducing the risk of loss to predators.

5.8.2 Potential Impacts from the No Action Alternative

Under the no action alternative, management of special status listed species would be in compliance with the BO, and for the most part, similar to that under the proposed action. Some management activities such as those proposed in the INRMP, however, could be limited to short-term responses to individual federal and state requirements for resource management at NBVC Point Mugu. Because long-term management plans (longer than 1 year) for special status listed species would not be outlined in an INRMP, they might not occur or may not be integrated with all tenant missions at NBVC Point Mugu or with all stakeholder agencies. As a result, several of the projects described in the proposed action may not occur at all, may occur to a lesser extent than is planned under the INRMP, or may occur later than is scheduled under the INRMP. Because the no action alternative envisions adherence with all local, state, and federal natural resources management requirements, no significant impacts to special status listed species are anticipated from the no action alternative. The following activities would take place under the no action alternative, impacts from these activities are described in Section 5.8.1. Impacts described in Section 5.7.2 also apply to special status listed species.

- Annual population monitoring of special status listed species
- Installation of signs and fencing to restrict access to areas occupied by listed species
- Implementation of a Light-footed clapper rail captive breeding and enhancement program
- Removal of the Holiday Beach asphalt parking lot.
- Pad Alpha I habitat restoration project
- Pad Alpha II habitat restoration project
- Implementation of a predator management plan

- Removal of asphalt road and earthen berms at South J
- The eradication of nonnative plant species
- The preparation and implementation of a Jet Assisted Take-off (JATO) Bottle Removal Plan would remove JATO bottles from wetland areas
- Seven special aquatic site wetland restoration projects (Section 4.6.2)
- Removal or relocation of utilities underground within endangered species habitat.

Because the no action alternative includes adherence to all requisite local, state and federal natural resource requirements, many activities described in the proposed action are likely to take place. The activities listed below would enable NBVC Point Mugu to comply with the natural resource requirements listed for each activity in Table 2-1. However these activities are not required specifically by the referenced laws and regulations. They may or may not occur, or may be conducted at a slower pace or to a lesser extent than under the proposed INRMP.

- Restoration of Eastern arm snowy plover habitat
- Coyote studies

5.9 CULTURAL RESOURCES

Cultural resources are limited, nonrenewable resources that may easily be diminished in value by physical disturbances. Impact analysis on cultural resources includes the effects on eligibility for the National Register of Historic Places, future research potential, or suitability for religious or traditional uses. A cultural resource could be affected if an action resulted in the physical alteration, destruction, or loss of a resource listed or eligible for listing on the National Register of Historic Places. An adverse impact would not be significant if only a small part of the resource were affected or if the value of the resource was not high. The impact of the action could be beneficial if it protected or reconstructed the resource.

The affected environment contains one cultural resource deemed eligible for the National Register of Historic Places (see Section 4.10). The site has been partially recovered and removed by excavation. A portion of the site is believed to be under asphalt.

5.9.1 Potential Impacts of the Proposed Action

One activity in the proposed INRMP involves removing an asphalt parking lot. This lot would be removed in a location that is more than 3 miles west of any cultural resource site described in Section 4.10 (Figure 2-1) so would therefore not impact a cultural resource site. The proposed action would have no adverse impacts on cultural resources at NBVC Point Mugu.

5.9.2 Potential Impacts of the No Action Alternative

The no action alternative would result in the same impacts described under Section 5.9.1. Because no excavation or construction is planned under the no action alternative, it would result in no adverse impacts to cultural resources.

5.10 PROTECTION OF CHILDREN

Under Executive Order 13045 of April 21, 1997 (Protection of Children From Environmental Health Risks and Safety Risks), a federal agency, to the extent permitted by law and appropriate, and consistent with the agency's mission (a) shall make it a high priority to identify and assess environmental health risks and safety risks that may disproportionately affect children; and (b) shall ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks required to evaluate the environmental health and safety risk to children from a proposed action. The proposed action and no action alternatives are evaluated for the following potential impacts to children: increased exposure to physical injury, diminished protection from standard safety features, and activities that could influence children's behavior to make them more susceptible to accidents.

5.10.1 Potential Impacts of the Proposed Action

Unescorted children are not allowed at NBVC Point Mugu at any time. This policy was in place before the proposed action was considered and would not change under the proposed action. The proposed action does not include any activities that would increase the number of children on base or that would harm children. As a result, no adverse impacts to children are anticipated as a result of the proposed action.

5.10.2 Potential Impacts of the No Action Alternative

Implementation of the no action alternative would be expected to have the same impacts as those described in Section 5.10.1.

5.11 ENVIRONMENTAL JUSTICE

Pursuant to Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations, the proposed action and no action alternative must be evaluated to assess whether they could result in any disproportionately high and adverse human health or environmental effects on minority and low-income populations.

5.11.1 Potential Impacts of the Proposed Action

The proposed action would not affect any non-military communities, including minority or low-income groups. There would be no burdens on any community resources, nor would any adverse health conditions be created by the proposed action. As a result, there are no adverse impacts on minority or low-income populations.

The proposed action would take place in an ROI that includes an average household income that is slightly higher than the national average (Section 4.11). The closest city to NBVC Point Mugu is Oxnard, where the average cost for a single-family home is \$200,000, slightly lower than the average for a house in Ventura County. Implementation of the proposed action would not adversely affect the housing market or provide beneficial or adverse affects to low-income and minority populations. The proposed action would not present a disproportionate impact to human health or the environment for minorities or low-income populations in Ventura County or California. In addition, no additional burdens would be imposed on local minority or low-income services as a result of the proposed action.

5.11.2 Potential Impacts of the No Action Alternative

The no action alternative would create no significant impact on environmental justice in Ventura County.

5.12 HAZARDOUS AND TOXIC MATERIALS/WASTES

Impacts analysis includes the increased potential for workers or the public to be exposed to hazardous materials or wastes above health criteria levels. A beneficial impact would occur if hazardous material or quantities of waste are reduced or eliminated.

5.12.1 Potential Impacts of the Proposed Action

NBVC Point Mugu currently has an effective pollution prevention strategy that includes waste minimization through reuse and recycling; hazard reduction through replacement of hazardous materials such as chlorinated solvents with citrus-based solvents; and education programs in best management practices for the storage, use, and disposal of all hazardous and toxic materials and wastes. No hazardous materials would be managed under the proposed action.

5.12.2 Potential Impacts of the No Action Alternative

No adverse or beneficial impacts would result from the no action alternative.

5.13 CUMULATIVE IMPACTS

The previous sections describe the potential impacts that could occur at NBVC Point Mugu as a result of the proposed INRMP. NEPA also requires that EAs evaluate whether the proposed action could result in cumulative environmental impacts. Cumulative impacts were identified by comparing the potential impacts of the proposed action and other past, current, or proposed actions in the area to establish whether, in the aggregate, they could result in environmental impacts.

This section describes unavoidable and cumulative impacts as a result of the proposed action or no action alternative. The results of this analysis indicate that no cumulatively significant impacts are projected to occur.

5.13.1 Location

No cumulatively significant impact to land use would occur as a result of the proposed action or the no action alternative.

5.13.2 Land Use

Changes in land use proposed in the INRMP or the no action alternative do not conflict with, or have a potential cumulatively adverse impact on, projects proposed by the Public Works Planning Branch at NBVC Point Mugu (listed in Section 4.2.4). No cumulatively significant impact to land use would occur as a result of the proposed action or the no action alternative.

5.13.3 Air Quality and Noise

Because no adverse impacts to air quality are expected to occur as a result of the alternatives, no cumulatively significant impact would occur from the proposed action or the no action alternative and other activities planned at NBVC Point Mugu. Noise may be reduced under the proposed action, resulting in a beneficial impact. No cumulatively significant impact would occur as a result of the proposed action or the no action alternative and other activities planned at NBVC Point Mugu.

5.13.4 Geologic and Soil Resources

Minerals and paleontological resources with economic value are not found under NBVC Point Mugu. The study area is considered a hazard zone for liquefaction in the event of an earthquake; however, the proposed action and no action alternatives would not mitigate or exacerbate the geologic hazard. Soil may be improved through implementation of erosion mitigation measures proposed in the INRMP. No cumulatively significant impact would occur to geology or soils as a result of the proposed action or the no action alternative and other planned activities at NBVC Point Mugu.

5.13.5 Water Resources

The proposed action includes no activities that would impair water quality, quantity, or water rights, or increase the flood hazard at NBVC Point Mugu. Several activities proposed in the INRMP would result in beneficial impacts to water resources. No unavoidable or significant cumulative impacts are predicted for the proposed action or no action alternative.

5.13.6 Biological Resources: Wetlands, Vegetation, Wildlife, and Listed Species

All activities proposed in the INRMP are designed to have a net beneficial impact to biological resources at NBVC Point Mugu. No unavoidable or significant cumulative impacts would occur under the proposed action or no action alternative.

5.13.7 Cultural Resources

The proposed action would have no adverse impacts on cultural resources at NBVC Point Mugu. No unavoidable or significant cumulative impacts would occur under the proposed action or no action alternative.

5.13.8 Socioeconomic Resources

No unavoidable impacts are expected to occur. No cumulatively significant socioeconomic impacts are likely. The contribution of NBVC Point Mugu to the local economy based on activities proposed in this EA would not be significant. No unavoidable or significant cumulative impacts would occur under the proposed action or no action alternative.

5.13.9 Hazardous and Toxic Wastes and Materials

Implementing the proposed action would not change the type or amount of activities that occur in the affected environment. No cumulatively significant adverse impacts to environmental programs are projected to occur under the proposed action or no action alternative.

5.14 IRREVERSIBLE AND/OR IRRETRIEVABLE COMMITMENTS OF RESOURCES

An irreversible and irretrievable commitment of resources would be a permanent loss of resources or where resources would be indefinitely foregone (that is, resources would remain but would be inaccessible or could not be used). Implementation of the INRMP would not result in an irreversible and irretrievable commitment of any natural or cultural resources.

5.15 RELATIONSHIP BETWEEN SHORT-TERM AND LONG-TERM ENVIRONMENTAL LOSSES AND GAINS

The purpose of the proposed INRMP is to protect and enhance wildlife habitat and wildlife at NBVC Point Mugu. The proposed action contains no activities that would result in any short-term or long-term environmental losses.

5.16 COMPATIBILITY OF THE ALTERNATIVES WITH OBJECTIVES OF FEDERAL, STATE AND LOCAL LAND USE PLANS, POLICIES, AND CONTROLS

The proposed action would be compatible with existing federal, state, and local land use plans, policies, and controls (listed in Section 3.1.1.1) and with the Navy mission and those of the NBVC Point Mugu tenants (Section 3.1.1.2). The action would also be consistent with current and planned activities in the affected environment.

The no action alternative could be incompatible with the 1997 SAIA and associated *Guidelines for Providing Integrated Natural Resources Management Plans for Navy Installations*. The no action alternative would implement requirements in the Biological Opinion and would continue natural resource management in compliance with all local, state, and federal requirements. This management strategy does not comply with the SAIA and does not set forth procedures to integrate natural resource management planning with other agencies or with other Navy departments at NBVC Point Mugu. In addition, the existing approach provides only general and regulation-specific guidelines for natural resource management, while the proposed action would implement well-developed programs and other actions designed to protect and promote the health of natural resources and NBVC Point Mugu.

SECTION 6.0: CONCLUSION

In accordance with the CEQ regulations that implement the National Environmental Policy Act of 1969, as amended, and Navy Regulation OPNAVINST 5090.1B (Environmental and Natural Resources Program Manual), an evaluation of the identified and cumulative effects has been prepared for the actions described in the EA. The EA concludes that the action will have no significant impact to the quality of the human or natural environment. Therefore, an Environmental Impact Statement is not warranted.

6.1 COMPARISON OF ALTERNATIVES

This EA provides an evaluation of the proposed action and a no action alternative in Chapter 5. All impacts for the proposed action and the no action are the same for the following resource areas: land use, air quality, noise, geology, cultural resources, socioeconomics, environmental justice, and hazardous waste and toxic materials management. The following resource areas would experience beneficial impacts under the proposed action that are less likely to occur under the no action alternative: location, soils, water, special aquatic sites, biological resources and special status listed species. Beneficial impacts that are included in the proposed action and are not specified under the no action alternative (but are not precluded by the no action alternative) are described below under each resource area category.

Location: the implementation of a study of submarine canyon migration under the proposed action is unlikely to take place in the no action alternative. This study would provide the Navy with information regarding the canyon migration and its potential affect on the Mugu Lagoon inlet. Changes in the configuration of the submarine canyon could have an affect on the shape of NBVC Point Mugu and its military operations. Understanding the processes affecting canyon migration may aid the Navy in the development of mitigation options for addressing any change.

Soils: the implementation of a Soil Conservation Plan/Erosion Control Plan under the proposed action would outline soil management practices including soil surveys, erosion control procedures and soil conservation measures.

Water and Special Aquatic Sites: the proposed INRMP includes the following water-quality protection activities that are not planned under the no action alternative: a Soil Conservation

Plan/Erosion Control Plan, tidal influx study, participation in the Calleguas Creek Watershed and Ormond Beach Task Force, and include a non-point source pollution studies in the SWPPP.

Biological Resources and Special status listed species: the proposed INRMP includes the following activities designed to protect and enhance natural resources at NBVC Point Mugu. These activities are not specifically required under the no action alternative although the no action alternative does not preclude implementation of any of these activities.

- A submerged aquatic habitat and essential fish habitat study
- Fisheries surveys
- Preparation and implementation of a Bat Management Plan
- Membership in the Western Hemispheric Shorebird Reserve
- Preparation and implementation of a Soil Conservation Plan/Erosion Control Plan
- A tidal influx study of the hydrology of the Mugu Lagoon
- Participation in the Calleguas Creek Watershed and Ormond Beach Task Force
- A study of the submarine canyon
- Completion of a second generation Geographic Information System (GIS) Habitat Type Classification Map
- Updating and implementing the Integrated Pest Management
- Updating the Storm Water Pollution Prevention Plan to include identification of non-point source pollution
- Update the Bird Air Strike Hazard (BASH) Plan
- Establishing an experimental Ventura Marsh Milk Vetch population
- The installation of bird-deterrence devices near airfields
- Conducting a Hazard Risk Assessment to study bird hazards
- Implementation of BIRD RAD
- Modification of the grounds maintenance contract to include mowing to maintain infields and approach zones at 7 inches to 14 inches
- Use of satellite telemetry for waterfowl movement
- The creation of a natural resources orientation program for new personnel at NBVC Point Mugu
- Relocating the campground near the beach area and lagoon farther west and establishing a capacity cap for camp sites

- Restoration of Eastern arm for snowy plover habitat
- Coyote studies

The no action alternative would likely benefit biological resources through implementation of the Biological Opinion. However, the no action alternative lacks long-term planning and integration of natural resources management with all stakeholder concerns. The no action alternative would likely result in a level of natural resource planning, project implementation, and research that is lower than is described under the proposed action.

6.2 MITIGATION MEASURES

The 1978 CEQ regulations for implementing NEPA recognize the following five means of mitigating an environmental impact:

- Avoidance (No Action)
- Limitation of Action (Minimization)
- Restoration of Environment (Remediation)
- Preservation and Maintenance Operation (Reduction)
- Replacement (Compensation)

Proposed measures to mitigate adverse impacts that were identified as part of this EA are noted below, as applicable.

Compatibility of the Alternatives with Objectives of Federal, State, and Local Land Use Plans, Policies and Controls

The no action alternative could result in an unavoidable and significant adverse impact to the efforts of NBVC Point Mugu to comply with federal natural resource management laws. This impact would be mitigated by implementation of the proposed action.

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SECTION 9.0: ACRONYMS AND GLOSSARY

AGL	Above Ground Level
AICUZ	Air Installation Compatible Use Zone
AIMD	Aircraft Intermediate Maintenance Department
APZ	Accident potential zones
AQI	Air Quality Index
BASH	Bird Aircraft Strike Hazard
BO	Biological Opinion
BOS	Base Operating Support
C4ISR	Command, control, communication, computer, intelligence, surveillance and reconnaissance
CDFG	California Department of Fish and Game
CDWR	California Department of Water Resources
CE	California State Endangered
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
cfs	Cubic feet per second
cm	Centimeter
CNEL	Community Noise Equivalent Level
CNO	Chief of Naval Operations
CNRSW	Commander Navy Region Southwest
COMAEWINGPAC	Commander Airborne Early Warning Wing U.S. Pacific Fleet
CS	California State Sensitive
CWA	Clean Water Act
dB	Decibels
DDT	Dichlorodiphenyltrichloroethane
DoD	U.S. Department of Defense
DODD	Department of Defense Directive
DODINST	Department of Defense Instruction
E	Einsteins
EA	Environmental Assessment
E-2C	Airborne Early Warning Wing
EFH	Essential Fish Habitat
EO	Executive Order
EOD	Explosive Ordnance Division
EPR	Environmental Program Requirements
ESA	Endangered Species Act
ESH	Environmentally Sensitive Habitat
FCLP	Field Carrier Landing Practice
FE	Federal Endangered; endangered of becoming extinct
FMP MOCC EPAC	Fleet Maritime Patrol, Mobile Operations Control Center East Pacific
FT	Federal Threatened; threatened with becoming endangered

GIS	Geographic Information System
HAPC	Habitat Areas of Particular Concern
HARP	Historic Archaeological Resources Protection Plan
HRA	Hazard Risk Assessment
INRMP	Integrated Natural Resources Management Plan
IRP	Installation Restoration Program
JATO	Jet Assisted Take Off
$\mu\text{g}/\text{m}^3$	Micrograms per cubic meters
m^2	Meters squared
mgd	Million gallons per day
mg/L	Milligrams per liter
MBTA	Migratory Bird Treaty Act
MEA	Management Emphasis Area
MMPA	Marine Mammal Protection Act
MWR	Morale, Welfare, and Recreation Office
NAS	Naval Air Station
NAVAIRES	Naval Air Reserve
NAVFAC	Naval Facilities
NAVFACINST	Naval Facilities Instruction
NAVSOC	Naval Satellite Operations Center
NAWCWD	Naval Air Warfare Center, Weapons Division
NBVC	Naval Base Ventura County
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRM	Natural Resources Management
NWTS	Naval Weapons Test Squadron
ODD	Oxnard Drainage Ditch
PACFLT	Pacific Air Command Fleet
PCB	Polychlorinated biphenyls
PIF	Partners in Flight
PM_{10}	Particulate matter larger than 10 microns
PMTC	Pacific Missile Test Center
ppm	Parts per million
ppt	Parts per trillion
RCRA	Resource Conservation and Recovery Act
RDT&E	Research, Development, Test and Evaluation
RWQCB	Regional Water Quality Control Board
ROI	Region of influence ROI
RONA	Record of Nonapplicability

SAIA	Sikes Act Improvement Act
SARA	Superfund Amendments and Reauthorization Act
SAS	Special aquatic sites
SMMNRA	Santa Monica Mountain National Recreation Area
SOUTHWESTNAVFACENGCOM	Southwestern Division, Naval Facilities Engineering Command
TDS	Total dissolved solids
T & E	Test and evaluation
UCLA	University of California, Los Angeles
USACE	U.S. Army Corps of Engineers
USC	U.S. Code
USFWS	U.S. Fish and Wildlife Service
UWCD	United Water Conservation District
VCAPCD	Ventura County Air Pollution Control District
WHSRN	Western Hemispheric Shorebird Reserve Network

Glossary of Terms

Abiotic. Dealing with nonliving matter.

Access. The opportunity to approach, enter, and make use of public lands.

Alluvium. A deposit of sand, silt, mud, or other detritus left by flowing water in river beds, flood plains, lakes, and the like.

Anthropogenic. Made by humans.

Aquifer. A water-bearing layer of permeable rock, sand, or gravel. An underground bed or layer of earth, gravel, or porous stone that yields water.

Archaeological. The systematic recovery and study of material evidence, such as graves, buildings, tools, and pottery, remaining from past human life and culture.

Base Comprehensive Plan. An urban planning document that includes a basic natural resource description and summary of the Natural Resource Management Plan.

Bathymetry. The science of measuring and charting the depths of seas, lakes, and other bodies of water.

Benthic. Of or having to do with the bottom of oceans or seas.

Biological. Dealing with living matter.

Biological Diversity. The variety of life and its processes, including the variety in genes, species, ecosystems, and the ecological processes connecting everything in ecosystems.

Biomass. The total weight of all living organisms, or some designated group of living organisms, in a given area. Also, the amount of living matter in a given unit of the environment.

Botanical Areas. Sites with individual specimens (for example, a state or national champion tree) or communities (for example, spruce-fir forests on southern mountain tops) of plants that are important because of their form, color, occurrence, location, life history, arrangement, rarity, cultivation, or other features.

Brackish. Having a somewhat salty taste, especially from containing a mixture of seawater and fresh water.

Carnivore. An organism that feeds on animal tissue.

Carrying Capacity. In ecology, the largest number of organisms of a particular species that can be maintained indefinitely in a given part of the environment.

Competition. In ecology, use of the same resource by two or more species, when the resource is present in insufficient supply for the combined needs of the species.

Comprehensive Plan. The combination of the General Plan, Component Plans, Elements, and Maps that document a wide range of information necessary for decision making. It encompasses those specific resource documents and processes determined to be essential for planning and managing an installation's physical assets in support of the mission. The comprehensive plan is the all-encompassing description of the products, whereas comprehensive planning is the action associated with the process, and implementation.

Comprehensive Planning. The ongoing, iterative, participatory process addressing the full range of issues that affect or are affected by an installation's development. Through this process, goals and objectives are defined, issues are identified and information is gathered,

alternative solutions are developed and a sound decision-making process is employed to select a preferred alternative for implementation.

Consumer. An organism that eats the tissue of some other organism.

Cooperative Agreement. A written agreement between an Air Force installation and one or more outside agencies (federal, state, or local) that coordinates planning strategies. It is a vehicle for obtaining assistance in developing natural resources programs.

Critical Habitat. Any air, land, or water area (excluding existing synthetic structures or settlements that are not necessary to the survival and recovery of a listed species) and constituents thereof that the U.S. Fish and Wildlife Service has designated as essential to the survival and recovery of an endangered or threatened species or a distinct segment of its population.

Decomposers. The breakdown of matter by bacteria. It changes the chemical makeup and physical appearance of materials.

Detritus. Dead or decomposed organic matter.

Developed Recreation. Recreation that requires facilities that in turn result in concentrated use of an area. Examples include campgrounds and picnic area.

Dispersed Recreation. Recreation that requires few, if any, improvements and may occur over a wide area. This type of recreation involves activities related to roads, trails, undeveloped waterways, and beaches. The activities do not necessarily take place on, or adjacent to a road, trail, or waterway, only in conjunction with it. Activities are often day-use oriented and include hunting, fishing, boating, and hiking.

Disturbance. A short-term event that disrupts populations, communities, or ecosystems by changing the environment.

Diurnal. Occurring every day; daily.

Ecological Association. Areas on NBVC Point Mugu divided into ecological units based on similarities in soils, hydrology, plants, animals, etc.

Ecological Process. The actions or events that link organisms and their environment; such as predation, mutualism, successional development, nutrient cycling, carbon sequestration, primary productivity, fire cycles, hydrologic patterns, and decay.

Ecological Reserve Areas. A physical or biological unit that maintains current natural conditions insofar as is possible. These conditions are ordinarily achieved by allowing natural, physical, and biological processes to prevail without human intervention. However, under unusual circumstances, deliberate manipulation may be used to maintain the unique feature the ecological reserve area was established to protect.

Ecology. The science of the interrelationships between organisms and their environments.

Ecosystem. A complex, interactive community of organisms and its environment functioning as an ecological unit in nature.

Ecosystem Management. The careful and skillful use of ecological, scientific, social, and managerial principles in managing ecosystems to restore and sustain the integrity of an ecosystem (composition, structure, and function) and produce ecologically acceptable levels of sustainable multiple uses.

Element. Refers to a source of information on a functional area related to planning but required by a separate Air Force program. Examples include *Housing Community Plans*, *Land*

Management Plans, and *Outdoor Recreation Plans*. Elements can be in the form of maps, plans or studies, and, in combination with other information, are used in making planning and development decisions. Information contained in the elements contribute to the development of *Component Plans* and the *General Plan*.

Elevation. The height of land (in feet or meters) above sea level.

Emigration. The movement of animals away from a specific area (opposite of immigration).

Endangered Species. Any species of animal or plant that is in danger of extinction throughout all or a significant portion of its range. Plant or animal species identified by the Secretary of the Interior as endangered in accordance with the Endangered Species Act of 1973.

Endangered and Threatened Species Habitat. Existing habitat for listed, proposed, or category 1 candidate species on the national or state lists.

Epifaunal. Organisms that live on the surface of sediments, plants, or objects on the sea floor.

Erosion. The process of diminishing the land by degrees by running water, wind, ice, or other geological agents.

Estuary. A semi-enclosed coastal body of water that has a free connection with the open sea; it is thus strongly affected by tidal action, and seawater is mixed (and usually measurably diluted) with fresh water from land drainage. The part of the wide lower course of a river where its current is met by the tides.

Exotic Species. Any plant or animal that is not native to a region, state, or country.

Fault. A fracture line along which movements have occurred, causing the geologic units on either side to be mismatched.

Fauna. The grouping of animals representative of a particular region or period.

Fisheries. The industry or occupation devoted to catching, processing, or selling fish, shellfish, or other aquatic animals.

Floodplain/Floodplains. The area of land adjoining a body of water that has been or may be covered by floodwater. Lowland or flat areas adjoining inland and coastal waters, including flood-prone areas on offshore islands, that have a 1-percent or greater chance of flooding in any given year.

Flora. The plant life characteristics of a geographical area.

Food Chain. A portion of a food web, most commonly a simple sequence of prey species and the predators that consume them. Also, the interconnected feeding relationships of various species that transfer energy from an initial source through a series of organisms.

Food Web. The complete set of food links between species in a community; a diagram showing which ones are the eaters and which ones are consumed.

Forage. The act of looking or searching for food or provisions.

Forbs. A grouping or category of herbaceous plants, which are not included in the grass, shrub, or tree groupings or categories; generally smaller flowering plants.

Game. Any species of fish or wildlife for which state or federal laws and regulations prescribe seasons and bag or creel limits.

General Plan. The document that provides the installation commander and other decision makers a consolidated picture of an installation's capability to support the mission with its

physical assets and delivery systems. It is a general assessment of the installation structure to gauge development potential.

Genetic Variability. A range of phenotypes for a character. Genetic variability arises initially by mutation and is maintained by sexual reproduction. Such variation is the raw material for natural selection to act on, ensuring that the best-adapted variants.

Geographic Information System (GIS). A computer-based technology characterized by specific hardware and software that permits the simultaneous storage, management, and analysis of data, along with its geographic location. A spatial database management system.

Geological Areas. Sites with outstanding geological formations or historical features of the earth's development. Examples would be volcanic areas, areas of exposed rock (such as faults, cliffs, crevices, caverns), and outstanding natural features such as major watersheds.

Goal. The general target or result to be achieved by the integrated natural resources management effort. See Objectives.

Guidelines. Requirements which preclude or impose limitations on resource management, generally for environmental protection and safety.

Habitat. The sum total of biotic and abiotic conditions that make up a specific environment where an organism or biological community normally lives or occurs.

Halophytic. Plants that are growing or adapted to grow in salty soil or in saline conditions.

Hazardous Waste. A substance, such as nuclear waste or an industrial byproduct, that is potentially damaging to the environment and harmful to the health and well being of human beings and other living organisms.

Historic Areas. Sites that commemorate lives or occurrences in American or Navy history. Sites may commemorate a specific historic event, a period in history, or be unique or illustrative. Examples are historic buildings, districts, structures, or sites and primitive farms, including the identification, evaluation, recordation, documentation, curation, acquisition, protection, management, rehabilitation, restoration, stabilization, maintenance, and reconstruction of districts, sites, buildings, structures, and objects significant in American history, and architecture.

Hydric. Relating to, characterized by, or requiring considerable moisture.

Hydrophyte. A plant adapted to grow in water.

Immigration. The movement of organisms into a specific area. Compare emigration.

Infaunal. Organisms that live in the substrate or soft sea bottom.

Indicator Species. A species selected because its population changes indicate effects of management actions on the plant and animal community or the health of an ecosystem. A species whose condition can be used to assess the impacts of management actions on a particular area.

In Situ. Typically refers to remediation measures that take place on site without removal of contaminated material. The material is treated in place.

Installation. Military base or camp, including all lands, buildings, and runways.

Integrated Natural Resources Management. A process for selecting strategies to manage all natural resources so all aspects of management are studied and considered.

Integrated Pest Management. A process for selecting strategies to regulate forest pests in which all aspects of a pest-host system are studied and weighed. A basic principle in the choice of strategy is that it be ecologically compatible or acceptable.

Interdisciplinary Team. A group of individuals with different training assembled to solve a problem or carry out a task. The team is assembled recognizing that no one scientific discipline is sufficiently broad enough to adequately solve the problem. Through interaction, participants bring different points of view and a broader range of expertise to resolve the problem.

Introduced Species. A species brought into an area by people; one that is not a native. To bring in and establish in a new place or environment.

Inversion. An atmospheric condition in which the air temperature rises with increasing altitude, holding surface air down and preventing dispersion of pollutants.

Invertebrates. Animals without a backbone.

Issue. A point, matter, or section of public discussion or interest to be addressed or decided.

Landscape. An area composed of interacting and inter-connecting patterns of habitats (ecosystems) that are repeated because of the geology, landforms, soils, climate, biota, and human influences throughout the area. Landscape function is based on disturbance, successional development of landscape structure, and flows of energy and nutrients through the structure of the landscape. A landscape is composed of watersheds and smaller ecosystems.

Leachate. A product or solution formed by leaching, especially a solution containing that contains contaminants picked up as they leach through soil.

Life History. The stages an individual goes through during its life.

Livestock. Domestic animals kept or raised for food, by-products, work, transportation, or recreation.

Management Emphasis Area (MEA). An area selected for management of an emphasized natural resource, and common management objectives.

Map. A graphic representation, usually on a plane surface, and at an established scale, of natural or artificial features on the earth surface of the installation, surrounding area and region. The features are positioned relative to a coordinate reference system. Maps in most cases will be computer generated. Maps support the General Plan, Component Plans, and Elements.

Mitigate. To lessen or minimize the severity of an action.

Multiple-Use. The management of renewable surface resources so they are used in the combination that best meets the needs of the public.

Multiple-Use and Sustained Yield Management. The care and use of natural resources to best serve the present and future needs of the United States and its people without impairing the productivity of the land and water.

Mutualism. The type of symbiosis in which both species profit from the association.

Natural Resource Areas. Managed areas suitable for demonstration, education, and research. Sites should demonstrate the compatibility of different resource uses and sustained yield production.

Neotropical. Of, or belonging to, the region that includes most of the Caribbean, tropical North America, and all of South America.

Non-Point (pollution) Sources. Diffused and intermittent sources influenced by factors such as land use, climate, hydrology, topography, native vegetation, and geology.

Non-point-source Pollution. Caused by residuals carried into streams, lakes, and estuaries by surface water as well as to groundwater zones by infiltration and percolation. These pollutants do not result from a direct release from a pipe or channel.

Objectives. Specific intermediate targets; the accomplishment of which enables the program to approach achievement of the goals. See Goals.

Obligate. Able to exist under or restricted to only one set of environmental conditions, as a parasite that can survive only by living in close association with its host.

Organic. Having properties associated with living organisms.

Outdoor Recreation. Recreation that relates directly to and occurs in natural, outdoor environments.

Outdoor Recreation Resources. Land and water areas and associated natural resources that provide, or have the potential to provide, opportunities for outdoor recreation for present and future generations.

Out-of-kind. Mitigating for loss of habitat using habitat in a different classification level.

Perennial. Lasting or active through the year or through many years.

Perennial Plant. A species of plant that lives longer than 2 years.

Pinnipeds. Belonging to a suborder (or, in some classifications, an order) of carnivorous mammals. The pinnipeds are a group of aquatic mammals that includes seals, sea lions, and walruses.

Physiognomy. The interpretation of outward appearance

Pleistocene. Of, belonging to, or designating the geologic time, rock series, and sedimentary deposits of the earlier of the two epochs of the Quaternary Period, characterized by the alternate appearance and recession of northern glaciation and the appearance of the progenitors of human beings.

Pliocene. Of, belonging to, or designating the geologic time, rock series, and sedimentary deposits of the last of the five epochs of the Tertiary Period, characterized by the appearance of distinctly modern animals.

Population. All the organisms that constitute a specific group or that occur in a specified habitat.

Precocial. Born with down or feathers and with the eyes open, thus requiring little parental care after hatching.

Predation. Capturing prey as a means of maintaining life.

Range Operations Control Center (ROCC). Office responsible for coordinating missions and issuing clearance into closed areas on NBVC Point Mugu.

Research Natural Areas. Sites that serve scientific research and are protected from influence, which could alter or disrupt the characteristic phenomena for which the area was established. Their main purposes are to provide baseline areas against which effects of human activities can be measured, sites for study of natural processes in undisturbed ecosystems, and gene pool preserves of organisms, especially rare and endangered species.

Rhizomatous. A horizontal, usually underground stem that often sends out roots and shoots from its nodes. Also called rootstalk, rootstock.

Riparian Area. The area that includes a stream channel, lake, or estuary bed, the water itself, and the plants that grow in the water and on the land next to the water.

River Basin. The land area drained by a river and its tributaries.

Rookery. A breeding site for animals. A rookery can include perches and nests or other habitat suitable for breeding.

Roost. A perch on which birds rest or sleep.

Rotation. The planned number of years between the formation or the generation of a crop or stand of trees and its final cutting at a specified stage of maturity.

Runoff. Water from rain, snowmelt, or irrigation that flows over the ground surface and returns to streams.

Scenic Areas. Individual areas of outstanding natural beauty or scenic splendor that require special management to preserve their qualities.

Sedimentation. The act or process of depositing sediment.

Sensitive Species. Plant or animal species that are susceptible or vulnerable to activity or habitat alterations. Species that appear in the *Federal Register* as proposed for classification and are under consideration for official listing as endangered or threatened species. Also, those species that are on an official state list, or that are recognized by the Natural Resource Manager as needing special consideration to assure viable populations.

Seral Stage. One of a series of ecological communities that succeeds one another in the biotic development of an area.

Species Diversity. A weighted representation of the species of organisms living in a region; large and common species are given greater weight than are small and rare ones.

Species Richness. The number of species of organisms living in a region.

Stand. A group of trees that occupies a specific area, sufficiently uniform in composition, age arrangement, and condition as to be distinguishable from trees in adjoining areas.

State Historic Preservation Officer (SHPO). The official, appointed or designated pursuant to Section 101(b)(1) of the National Historic Preservation Act of 1966, as amended, to administer the State Historic Preservation Program.

Stewardship. Moral obligation for the careful and responsible management of the land and resources held in trust. This obligation includes the restoration and maintenance of ecosystem integrity while allowing for ecologically acceptable levels of sustainable multiple uses.

Stream. A general term for a body of flowing water. In hydrology, the term is generally applied to the water flowing in a natural channel as distinct from a canal. More generally, as in the term stream gauging, it is applied to the water flowing in any natural or artificial channel.

Sustainability. The ability to maintain a desired condition or flow of benefits over time.

Surface Water. Water that remains on the top of land, such as lakes, rivers, streams, and seas.

Swale. An elongated depression in the land. A low tract of land, especially when moist or marshy.

Sympatric. Occupying the same or overlapping geographic areas without interbreeding.

Telemetry. The science and technology of automatic measurement and transmission of data by wire, radio, or other means from remote sources, as from space vehicles, to receiving stations for recording and analysis.

Temporal. Pertaining to, concerned with, or limited by time.

Tenant Organization. A military organization assigned to an installation without host responsibilities.

Threatened Species. Any species that is likely to become endangered in the future throughout all or a significant portion of its range and that has been designated in the *Federal Register* by the Secretary of the Interior as a threatened species.

Topography. The physical features of a surface area, including relative elevations and the position of natural and artificial features. Graphic representation of the surface features of a place or region on a map, indicating their relative positions and elevations.

Tributaries. A stream that flows into a larger stream or other body of water.

Trophic Levels. The different levels through which energy flows from producers to consumers.

Understory. Herbs and shrubs that grow beneath a forest canopy.

Vegetative. Designating the division of nature that includes the vegetative kingdom; as, the vegetative as contrasted with the animal world; floral.

Vertebrate. A member of the subphylum Vertebrate, a primary division of the phylum Chordata that includes the fishes, amphibians, reptiles, birds, and mammals, all of which are characterized by a segmented spinal column and a distinct, well-differentiated head.

Wading Birds. A specific group of neotropical birds that feed in and around shallow, open water and nest in emergent trees and shrubs.

Wastewater. Water that has been used, as for washing, flushing, or in a manufacturing process, and so contains waste products; sewage.

Waterfowl. A water bird, especially a swimming bird.

Watershed. A drainage area separated from other drainage areas by a dividing ridge. The region draining into a river, river system, or other body of water.

Wetlands. Areas inundated by surface water or groundwater with a frequency sufficient, under normal circumstances, to support a prevalence of vegetative or aquatic life requiring saturated or seasonally saturated soil conditions for growth and reproduction. Wetlands generally include bogs, sloughs, river overflows, mud flats, seeps and springs.

Wild Areas. Sites that possess outstanding opportunities for solitude and primitive recreation. The minimum acreage for a wild area is 1,000 acres. Wild areas provide recreational opportunities such as hiking, camping, picnicking, photography, and swimming. The development of roads, other use facilities, and hunting is prohibited in these areas.

Wildland Urban Interface. Areas where urban development, rural subdivisions, or individual structures, adjoin natural or wildland areas.

Zoological Areas. Sites with animals (including invertebrates) that are significant because of their visibility, rarity, uniqueness, ecologically significant impact on land character, or other features. Examples are prairie dog towns, beaver ponds, raptor or other large bird nesting sites, or prairie chicken booming grounds.

APPENDIX A
INRMP IMPLEMENTATION PLAN

Chapter 9 Plan Implementation

This chapter presents procedures for implementing the INRMP including summaries of the proposed projects, economic analyses of projects, procedures for planning budgets, method of prioritizing projects, coordination of staff, and the importance of partnering with other groups. This chapter also provides an initial schedule including a table that summarizes the proposed projects by project category and priority for NBVC Point Mugu.

9.1 IMPLEMENTATION PROJECTS

Because of the small landmass that supports the natural resources and the associated sensitivity of the highly productive estuarine ecosystem (both being created in part as surrounding areas are developed), the Mugu Lagoon is an “island refugia.” Management of NBVC Point Mugu therefore requires extra effort to protect both the natural resources and the military mission. The existence of special status listed species on the base has triggered additional conservation measures by the Navy. The single-species management efforts have in turn resulted in protection of multiple habitats at NBVC Point Mugu and an adaptive management approach which helps protect and manage the ecosystem as a whole.

Many projects have been proposed as management guidelines in this INRMP to assist NBVC Point Mugu in integrating the military and natural resource missions while being good stewards of the natural resources. These projects are divided into categories; however, many overlap as a result of the overarching principles of adaptive ecosystem management that has been implemented at NBVC Point Mugu.

The projects recommended to achieve the management goals and objectives of the INRMP will each be accomplished to the maximum extent possible in light of the limitations of the budget cycle, amount and availability of funding, and manpower. Some of the projects may require contract support, whereas others can be accomplished using in-house staff and expertise. The Environmental Division, Natural Resources Office has assigned priorities based on the ability of each project to maximize achievement of multiple objectives and will design the projects to meet each relevant objective or group of objectives.

The projects should be designed to meet both the general management goals and objectives presented in Chapter 4, as well as the project-specific MEA goals and objectives discussed in

Chapters 6. Guidelines for general management activities are provided in Chapter 5, and guidelines for MEA activities are provided in Chapter 6. These guidelines seek to direct the Natural Resource Manager in selecting the best method or area to accomplish objectives of the plan and also provide constraints for certain management activities or areas. The natural resources constraints map (Figure 5-1), in combination with NBVC Point Mugu base land use planning maps, should serve as a thorough foundation for identifying where specific activities or projects may be applied. When projects are in the planning stage, the Natural Resource Manager and the Public Works Division Planning Branch will integrate the natural resources constraints and land use maps to evaluate the potential effects of the proposed project on natural resources and land use planning.

9.2 IMPLEMENTATION PROCEDURES

Implementation of projects and activities proposed in this INRMP depends upon the budget cycle, Navy funding priority (CNRSW/PACFLT/CNO), and the priority of the project, staffing, and supporting partnerships. Special requirements that may depend on contract services will also require preparation of a request for proposal.

9.2.1 Economic Analysis of Projects

Proposed projects will be designed and managed to be cost effective. Economic analysis will be conducted along with an evaluation of the effectiveness and efficiency of a project. Various cost-saving alternatives, or combinations of alternatives, will be evaluated as part of the planning process.

Any requirement to obligate funds for projects proposed in this INRMP will be subject to the availability of appropriations by Congress, and none of the proposed projects will be interpreted to require obligation or payment of funds in violation of any applicable federal law, including the Anti-Deficiency Act, 31 USC §1341, et seq.

9.2.2 Budget Planning

Since development and implementation of an INRMP is a requirement of the SAIA, requests for funding should be submitted to the major claimant during the Program Objective Memorandum/Program Review Baseline Assessment Memorandum (POM/PR BAM) process. The Chief of Naval Operations, CNO (N45), is the assessment sponsor at the Naval Operations

level. Navy guidance for developing INRMPs states that environmental compliance funding is the correct source for INRMP funds. SOUTHWESTDIV NAVFACENGCOM can assist in formulating requests and finding contract mechanisms that might be needed for projects.

Implementation of projects depends on the budget cycle and funding priorities. The Navy requires that Environmental Program Requirements (EPR) be prepared every year; however, the funds are directed to projects that have been approved for the EPR budget cycle. Therefore, the Natural Resource Manager should request project funding 3 years in advance. This schedule requires the Natural Resource Manager to forecast the status of listed species, restoration projects, and other wetland and fish and wildlife issues and to select the projects that should be funded to properly manage the natural resources. Because of the timing of this process, funding has already been projected for the next 5-year period covered by this INRMP.

9.2.3 Priority Ranking

Submissions during the budget cycle (EPRs) will include projects that achieve the full scope of the INRMP. Natural resource projects listed as reasonable and prudent compensatory measures for threatened and endangered species (required under the Programmatic Biological Opinion) and USACE wetland mitigation projects will receive the highest priority. These projects are top priority because they support compliance with federal and state laws. The following considerations should also be observed when ranking projects:

- Surveys and research on Type 1 areas on the natural resources constraints map (Figure 5-1) will be funded before other areas, followed by lower-priority constraint areas (Type 2 through Type 5). See Section 5.1.3 for a discussion of constraints.
- Projects that accomplish multiple objectives in areas where MEAs overlap will receive priority.

Projects that require funding to be implemented have been assigned to one of five categories based on Chief of Naval Operations (CNO) Funding Guidelines provided in the Program Objective Memorandum (POM) Fiscal Year 2004 Naval Environmental Requirements Guidebook: Level 1 Projects (Legal Requirement), Level 2 Projects (Navy Policy), Level 3 Projects (Pending Legislation), Level 4 Projects (Future Requirements), and Level 5 Projects (Leadership Initiatives).

- Level 1 (Legal Requirement) - Requirements derived from existing laws, regulations and EOs that apply to Navy activities, installations, ships, aircraft, and operations. These

Office of Management and Budget/EPA Class 0, I, or II projects or ongoing efforts include responding to applicable Federal, state and local requirements (such as the Resource Conservation and Recovery Act, CWA, Clean Air Act, Safe Drinking Water Amendments, NEPA, the Toxic Substances Control Act; and EOs such as 12088 (federal agency compliance), 12843 (conversion or replacement for equipment that contains ozone-depleting substances), 12856 (pollution prevention and the Emergency Planning and Community Right-to-Know Act) and 13101 (recycling). Level 1 includes overseas host nation laws and Final Governing Standards (FGS). Level 1 also includes costs of ongoing compliance, such as: manpower, training, travel and program management (OMB/EPA Class 0).

- Level 2 (Navy Policy) - Requirements are those derived from DoD or Navy policy. These projects/proposed efforts are not mandated by law or other federal, state, or local regulations or orders, but reflect implementation of Navy and DoD policy decisions and initiatives (such as elimination of PCBs).
- Level 3 (Pending Regulation) - Requirements derived from pending federal, state, or local regulations under development (where publication is scheduled) using, if available, model state regulation and permit standards.
- Level 4 (Future Requirements) - Requirements derived from future potential federal, state, or local legislation. These requirements are speculative.
- Level 5 (Leadership Initiatives) - Requirements based on local proactive Navy initiatives not mandated by law, regulation, EO, or policy.

Projects are funded according to these Navy assessment levels that are based on compliance and policy requirements and their importance for protection and enhancement of natural resources, as summarized above (taken from CNO Funding Guidelines). Projects will be funded in order of level.

9.2.4 Staffing

In addition to budgeting and setting priorities for projects, staff must also be coordinated. Staff coordination includes both planning teams for initiating projects and staffing teams to manage and run projects. Some of the projects described in this plan will depend on coordination with the Public Works Department and other installation personnel. Most projects, however, may require contractor services either because of a need for expertise or for personnel. These projects will require preparation of a request for proposal to acquire services, which should be considered to ensure appropriate funding can be obtained. Staffing needs should also be evaluated to determine whether budget proposals should include hiring additional in-house staff to support multiple or ongoing projects.

9.2.5 Implementation Partnerships

Implementation of this INRMP will depend in part on maintaining existing and building new successful partnerships with other agencies, universities, environmental organizations, and community groups. Currently, groups that participate in projects related to integrated natural resources management at NBVC Point Mugu include UCLA, California State University at Long Beach, Humboldt State University, University of Arizona, and California State University at Channel Islands. NPS, USFWS, and CDFG also play important roles. Other groups that have important ties to NBVC Point Mugu natural resources include the California Native Plant Society, the Calleguas Creek Task Force, the Ormond Beach Task Force, and species-specific national groups such as the Least Tern Working Group, the Snowy Plover Working Group, the Light-footed Clapper Rail Working Group, the Pacific Seabird Group, WHSRN, and Partners in Flight. Roles and responsibilities of these interested parties are identified in Section 1.3.

Cooperative agreements and participation in task forces are both important ways to provide a framework for obtaining assistance from these groups for natural resources management. In addition, techniques such as public forums, newspapers, prepared talks, special events, and conservation education centers should be used to inform the public of the values of natural resources conservation and ways they can help to support the program on the base.

9.3 IMPLEMENTATION SCHEDULE

This section provides a summary of natural resources management projects proposed in the INRMP, as well as compliance measures proposed in the Programmatic Biological Opinion for Threatened and Endangered Species. Projects are summarized in a tabular format (Table 9-1) and include a description of the activity, a brief summary of the purpose for each action, the priority for implementation based on funding (discussed in Section 9.2.3), and the proposed fiscal year for implementation. The projects are divided into management categories, including General, Threatened and Endangered Species, Wetlands, Fish and Wildlife, Soil and Water, and Outdoor Recreation. Projects in each category are organized according to priority from highest to lowest.

If at any time proposed projects are determined to have potential significant impacts on the military mission or on natural resources, they will undergo further environmental review before they are implemented.

Table 9-1 Implementation Summary for INRMP Projects

Action ¹	Purpose	Priority	Requirement	Fiscal Year Goal
<i>Threatened and Endangered Species Projects</i>				
Annual population monitoring of special status listed species	This project is a protective and compensatory measure established to monitor the demographic population status of listed species at NBVC Point Mugu and to ensure compliance with the Endangered Species Act (ESA) and the Programmatic Biological Opinion.	Level 1	Endangered Species Act Fish and Wildlife Conservation Act Migratory Bird Treaty Act OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73	Ongoing
Installation of signs and fencing to restrict access to areas occupied by listed species	This project is a compensatory measure under the Programmatic Biological Opinion. Signs and fencing shall be installed to restrict access to areas occupied by listed species and fitted appropriately to discourage perching by predatory birds.	Level 1	Endangered Species Act Fish and Wildlife Conservation Act Migratory Bird Treaty Act OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73	2001 (ongoing)
Light-footed Clapper Rail Captive Breeding and Enhancement Program	This is a compensatory measure under the Programmatic Biological Opinion. The captive breeding program is important for the recovery of the clapper rail (juvenile and egg translocation).	Level 1	Endangered Species Act Fish and Wildlife Conservation Act Migratory Bird Treaty Act OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73	2002 (ongoing)

Table 9-1 Implementation Summary for INRMP Projects (continued)

Action ¹	Purpose	Priority	Requirement	Fiscal Year Goal
<i>Threatened and Endangered Species Projects (continued)</i>				
Nonnative plant eradication	Nonnative plants (giant reed and iceplant, for example) compete with native plants for space and survival. U.S. Fish and Wildlife Service (USFWS) Programmatic Biological Opinion has required removal and control of all nonnative plants at Mugu Lagoon.	Level 1	Executive Order (EO) 13112 Federal Noxious Weed Act National Invasive Species Act OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73	2003
Holiday Beach asphalt parking lot removal	This activity is a part of the project description for the biological opinion for the western revetment seawall repair project (USFWS 2001c). This project would entail removal of the asphalt parking lot at Holiday Beach and restoration of sandy areas to create additional nesting habitat for the western snowy plover.	Level 1	Endangered Species Act Fish and Wildlife Conservation Act Migratory Bird Treaty Act OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73	2001 (ongoing)
Pad Alpha habitat restoration (1)	This is a compensatory measure under the Programmatic Biological Opinion. This project would remove all catapult berms in the area and restore the habitat to sandy beach for the western snowy plover.	Level 1	Endangered Species Act Fish and Wildlife Conservation Act Migratory Bird Treaty Act OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73	2003

Table 9-1 Implementation Summary for INRMP Projects (continued)

Action ¹	Purpose	Priority	Requirement	Fiscal Year Goal
<i>Threatened and Endangered Species Projects (continued)</i>				
Pad Alpha habitat restoration (2)	This project would restore native habitat for western snowy plover and light-footed clapper rail. Natural resources staff is working with the Planning Branch to remove all structures and restore the area to sandy beach and spiny rush for western snowy plover and light-footed clapper rail.	Level 1	Endangered Species Act Fish and Wildlife Conservation Act Migratory Bird Treaty Act OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73	2005
Implement predator management plan	Predator management is a compensatory measure under the Programmatic Biological Opinion. Creation and annual updating of a predator management plan will help implement conservative and selective control of nonnative and native predators that pose a threat to threatened and endangered species.	Level 1	Fish and Wildlife Conservation Act Migratory Bird Treaty Act OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73	Ongoing
South J light-footed clapper rail habitat restoration and enhancement	This is a compensatory measure under the Programmatic Biological Opinion. The action involves removal of asphalt road and earthen berms at South J and restoration of spiny rush habitat for the clapper rail.	Level 1	Endangered Species Act Fish and Wildlife Conservation Act Migratory Bird Treaty Act OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73	2003

Table 9-1 Implementation Summary for INRMP Projects (continued)

Action ¹	Purpose	Priority	Requirement	Fiscal Year Goal
<i>Threatened and Endangered Species Projects (continued)</i>				
Remove or relocate utilities underground within endangered species habitat	This is a compensatory measure under the Programmatic Biological Opinion. This action would protect species from flying into utility lines and would also guard species on the ground from predation by preventing the use of above ground lines and poles as perches.	Level 1	Endangered Species Act Fish and Wildlife Conservation Act Migratory Bird Treaty Act OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73	2004
Establish salt marsh bird's-beak populations in central basin and on the eastern arm of Mugu Lagoon	Historical populations of the salt marsh bird's-beak extended into the central basin of the Mugu Lagoon. The USFWS hopes to establish new populations in the central basin and on the eastern arm to enhance the survival of the species and rate of progress toward delisting.	Level 1	Endangered Species Act Fish and Wildlife Conservation Act OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73	2004
Prepare and implement a Jet Assisted Take-off (JATO) Bottle Removal Plan	This is a compensatory measure under the Programmatic Biological Opinion. This action involves removal of JATO bottles from wetland areas and requires a plan to establish the proper procedures (timing, methods) to protect listed species in the areas.	Level 1	Endangered Species Act Fish and Wildlife Conservation Act OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73	2001 (ongoing)

Table 9-1 Implementation Summary for INRMP Projects (continued)

Action ¹	Purpose	Priority	Requirement	Fiscal Year Goal
<i>Threatened and Endangered Species Projects (continued)</i>				
Eastern arm snowy plover habitat restoration	The habitat on the eastern arm has deteriorated as a result of the increase in growth and debris from giant reed and the decreased deposition of sediment. Cleaning up the debris and replenishing sand will restore prime nesting habitat for the western snowy plover.	Level 2	Fish and Wildlife Conservation Act Migratory Bird Treaty Act OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73	2004
<i>Wetland Restoration Projects</i>				
Oxidation Pond Restoration Site (Proposed Mitigation Bank)	This sludge remediation project will continue to be monitored. Study plots are functioning well and decisions about restoration of the tidal creek will be made when the study is complete.	Level 1	Clean Water Act River and Harbor Act USACE Regulatory Guidance (RGL) Letter 94-01 RGL 01-1 EO 11990 EO 11988	2001 (ongoing)
LAG4 (Proposed Mitigation Bank)	This project, at the site formerly known as known as Installation Restoration Program (IRP) Site 4, will continue to be monitored as a nest island. Vegetation control should be implemented to maintain the function of the site as nesting habitat for terns and skimmers. In addition, wetland restoration must remain in perpetuity (USACE 2001).	Level 1	Clean Water Act River and Harbor Act RGL Letter 94-01 RGL 01-1 EO 11990 EO 11988	2001 (ongoing)
South J wetland restoration site monitoring	The project will continue to be monitored for function and value. This area is a completed wetland restoration site. Wetland restoration must remain in perpetuity (USACE 2001).	Level 1	Clean Water Act River and Harbor Act RGL Letter 94-01 RGL 01-1 EO 11990 EO 11988	2001 (ongoing)

Table 9-1 Implementation Summary for INRMP Projects (continued)

Action ¹	Purpose	Priority	Requirement	Fiscal Year Goal
<i>Wetland Restoration Projects (continued)</i>				
L1 wetland restoration site monitoring	The project will continue to be monitored for function and value. Wetland restoration is completed. Wetland restoration must remain in perpetuity as determined by USACE permit conditions (USACE 2001).	Level 1	Clean Water Act River and Harbor Act USACE Regulatory Guidance (RGL) Letter 94-01 RGL 01-1 EO 11990 EO 11988	2001 (ongoing)
L2 wetland restoration site monitoring	Restoration of L2 will be completed and the project will be monitored for function and value. Wetland restoration must remain in perpetuity as determined by USACE permit conditions (USACE 2001).	Level 1	Clean Water Act River and Harbor Act USACE Regulatory Guidance (RGL) Letter 94-01 RGL 01-1 EO 11990 EO 11988	2002 (ongoing)
31st Naval Construction Regiment (NCR) Small Arms Range wetland restoration site monitoring	The project will continue to be monitored for function and value. Wetland restoration is completed. Wetland restoration must remain in perpetuity as determined by USACE permit conditions (USACE 2001).	Level 1	Clean Water Act River and Harbor Act USACE Regulatory Guidance (RGL) Letter 94-01 RGL 01-1 EO 11990 EO 11988	2001 (ongoing)
Las Posas Restoration Site (Proposed Mitigation Bank)	Los Posas Road Wetland Restoration Mitigation Bank project is a planned restoration of tidal wetlands at the former lagoon landfill, known as IRP Site 1.	Level 2	Clean Water Act River and Harbor Act USACE Regulatory Guidance (RGL) Letter 94-01 RGL 01-1 EO 11990 EO 11988	2005

Table 9-1 Implementation Summary for INRMP Projects (continued)

Action ¹	Purpose	Priority	Requirement	Fiscal Year Goal
<i>Fish and Wildlife Management Projects</i>				
Conduct coyote studies	This activity would investigate the ecological role of coyotes at NBVC Point Mugu and would evaluate the potential ecological effects of a coyote control as a part of the predator management program under the Programmatic Biological Opinion.	Level 1	Endangered Species Act Fish and Wildlife Conservation Act OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73	2002
Study the submerged aquatic habitat	NBVC Point Mugu lacks adequate data on essential fish habitat. Studies need to be conducted to identify characteristics of the submerged aquatic environment. Specific investigations should focus on the status and potential restoration of eelgrass beds.	Level 1	Magnuson-Stevens Fishery Management and Conservation Act Fish and Wildlife Conservation Act OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73	2004
Conduct fisheries surveys	NBVC Point Mugu lacks adequate data on populations of fish in Mugu Lagoon. Studies are needed to eliminate the data gap and enable efficient and effective management of the fish.	Level 1	Magnuson-Stevens Fishery Management and Conservation Act Fish and Wildlife Conservation Act OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73	2004

Table 9-1 Implementation Summary for INRMP Projects (continued)

Action ¹	Purpose	Priority	Requirement	Fiscal Year Goal
<i>Fish and Wildlife Management Projects (continued)</i>				
Prepare and implement a Bat Management Plan	There is limited information on bats and surveys are needed to properly manage them. A management plan will create a systematic means for studying, monitoring, and controlling bat populations and offers a way to educate Base residents and workers on bats.	Level 2	Fish and Wildlife Conservation Act Fish and Wildlife Coordination Act OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73	2002
Apply for Western Hemispheric Shorebird Reserve Network (WHSRN) Membership	The Mugu Lagoon is a critical stopover for migratory birds and provides habitat for thousands of shorebirds. Designation as a WHSRN member could provide an avenue for international recognition and funding. WHSRN is part of DoD/Partners in Flight (PIF).	Level 5	Migratory Bird Treaty Act Fish and Wildlife Conservation Act	2002
<i>Soil and Water Management Projects</i>				
Prepare and implement a Soil Conservation Plan/Erosion Control Plan	Navy policy (OPNAVINST 6250.4B) requires land management to control and prevent soil erosion and to preserve natural resources by conducting surveys and implementing soil conservation measures. Creation of a plan will aid in compliance with this requirement.	Level 2	Clean Water Act OPNAVINST 6250.4B	2004
Conduct a tidal influx study	Research is needed to study the hydrology of the Mugu Lagoon and the potential affect of increased tidal influx, particularly on habitat for salt marsh bird's-beak and clapper rails. Evaluations should be based on various flow conditions including removing or cleaning some or all culverts, and should include systematic measurements of physical characteristics such as salinity and water temperature.	Level 5	Coastal Zone Management Act California Coast Act Coastal Barrier Resources Act Clean Water Act	2005

Table 9-1 Implementation Summary for INRMP Projects (continued)

Action ¹	Purpose	Priority	Requirement	Fiscal Year Goal
<i>Soil and Water Management Projects (continued)</i>				
Calleguas Creek Watershed and Ormond Beach Task Force Participation	Participation in the task forces is important for understanding the effects of activities upstream and adjacent to the ecosystem of Mugu Lagoon. Participation also provides an avenue for regional ecosystem management.	Level 5	Clean Water Act EO 11990 EO 11988	2001 (ongoing)
Study of Submarine Canyon	Erosion in the submarine canyon and ultimately breakthrough of the beach barrier would cause direct intrusion of the Pacific Ocean into the Mugu Lagoon. Breakthrough threatens the current conditions of the lagoon and its ecosystem as well as Base operations. Because of the effects of erosion and breakthrough on the dynamics of the Mugu Lagoon and on military operations, studies are needed to examine movement of the canyon.	Level 5	Coastal Zone Management Act California Coast Act Coastal Barrier Resources Act Clean Water Act	2005
<i>General Projects</i>				
Complete the second generation Geographic Information System (GIS) Habitat Type Classification Map	The habitat types on the existing GIS map should be updated and a new map generated at 1:3600 photo scale.	Level 1	Endangered Species Act Fish and Wildlife Conservation Act Migratory Bird Treaty Act Clean Water Act OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73 EO 11990 EO 11988	2003

Table 9-1 Implementation Summary for INRMP Projects (continued)

Action ¹	Purpose	Priority	Requirement	Fiscal Year Goal
<i>General Projects (continued)</i>				
Update and implement the Integrated Pest Management Plan	Pest management can damage natural resources if not carried out properly. The plan would identify expected pests, biological and natural alternatives to chemical controls, and the least toxic pesticides for use around habitat for sensitive species. The plan also would establish timing, conditions, and procedures for pesticide application.	Level 1	Endangered Species Act Federal Insecticide, Fungicide, and Rodenticide Act Federal Noxious Weed Act OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73 EO 13112	2002
Update the Storm Water Pollution Prevention Plan (SWPPP) to include a non-point source pollution studies	This activity would identify management actions for best management practices for specific water resources. The task will be done in cooperation with the water resources manager.	Level 1	Clean Water Act Sikes Act Improvement Act	With SWPPP Update
Establish an experimental Ventura Marsh Milk Vetch population	Recommended action in the Biological Opinion. This action is intended to establish an experimental population not subject to ESA. The project would be managed by USFWS and the California Department of Fish and Game (CDFG).	Level 5	Fish and Wildlife Conservation Act Endangered Species Act	2003
<i>Bird Aircraft Strike Hazard (BASH) Projects</i>				
Update the Bird Air Strike Hazard (BASH) Plan	This activity would assist in managing the BASH issues on the Base and would complete the integration of the BASH Plan with the INRMP.	Level 2	Sikes Act Improvement Act OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73	2003

Table 9-1 Implementation Summary for INRMP Projects (continued)

Action ¹	Purpose	Priority	Requirement	Fiscal Year Goal
<i>Bird Aircraft Strike Hazard (BASH) Projects (continued)</i>				
Install spike strips on all plastic or metal signage, non-electronic equipment, and electronic equipment within as well as outside the primary surface area of the airfield on buildings, power poles, fences, and vertical gates, as needed	This activity prevents birds from perching on elevated equipment and reduces the BASH threat by decreasing perching locations for migrating and foraging birds.	Level 2	OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73	2002
Install whirlybirds on all tall structures and stainless wire on approach light pier	This activity prevents birds from perching on elevated equipment and reduces the BASH threat by decreasing perching locations for migrating and foraging birds.	Level 2	OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73	2002
Install Bird Barrier™ products (StealthNet, Bird-Flite, Bird-Coil, Bird-Shock, Birdwire, or Daddi Long Legs) on all tall structures, including buildings, poles, fencing, as needed	These devices are non-lethal methods for deterring birds from landing on structures. These devices reduce the BASH threat by decreasing perching locations for migrating and foraging birds.	Level 2	OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73	2002
Conduct a Hazard Risk Assessment	This assessment is a study of bird hazards and the relationship between bird habits and aircraft operations. The risk assessment methods should include researching all variables that define the hazard, including natural resources (birds, habitat) and aircraft operations.	Level 2	OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73	2002
Implement BIRD RAD	Data on the presence of birds in airspace and migratory patterns of diurnal and nocturnal birds increases the ability of air operations to detect and avoid BASH incidents.	Level 2	OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73	2002
Modify grounds maintenance contract to include mowing to maintain infields and approach zones at 7 inches to 14 inches on a monthly basis	Birds are less likely to feed or nest in grass that has been mowed between 7 and 14 inches, thereby reducing the BASH hazard without negative impacts to natural resources.	Level 2	OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73	2002

Table 9-1 Implementation Summary for INRMP Projects (continued)

Action ¹	Purpose	Priority	Requirement	Fiscal Year Goal
<i>Bird Aircraft Strike Hazard (BASH) Projects (continued)</i>				
Cut and scrape shrubs within a 150-foot buffer zone per P-80 manual	This activity could reduce bird habitat adjacent to the runway. The work should include proper erosion control if necessary.	Level 2	OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73	2002
Pave remainder of shoulder along Runway 3	Paving will prevent killdeer from nesting next to the runway, potentially reducing BASH, without harming natural resources.	Level 2	OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73	2003
Alter flight times to include down time 30 minutes before and after sunset	Altering flight hours will reduce BASH by minimizing the hazards from birds as they move to roosting sites, particularly larger birds during sundown (such as the great egrets). (Note that sunset changes throughout the year.)	Level 2	OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73	2002
Tree reduction (elimination or continual severe pruning of trees)	Reduction in the number of trees around the base (not including riparian stands) could reduce the perching and roosting grounds for larger birds, especially raptors, vultures, and egrets. Curtailing the addition of tall trees to new developments would also reduce the availability of predator perches.	Level 2	OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73	2002
Dry farming at the clear zone to approach at Runway 21 or alternatively paving with concrete	This action provides an alternative to grass to prevent nesting and foraging of birds, particularly larger birds, in grass areas.	Level 2	OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73	2005
Satellite telemetry for waterfowl movement	This activity increases the understanding of the migration habits of waterfowl, thereby allowing the Navy to adjust air operations to reduce BASH incidents.	Level 2	OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73	2005

Table 9-1 Implementation Summary for INRMP Projects (continued)

Action ¹	Purpose	Priority	Requirement	Fiscal Year Goal
<i>Outdoor Recreation Projects</i>				
<i>General</i>				
Complete negotiations for replacement of the tripartite agreement among the Department of the Navy, the National Park Service, and the State of California by approval of the INRMP	This action would provide the Navy with professional and technical information necessary to coordinate actions that involve outdoor recreation.	Level 2	Sikes Act Improvement Act Fish and Wildlife Conservation Act NAVFACINST MO-100.4 OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73	2002
Create a natural resources orientation program for new personnel at NBVC Point Mugu	This action would foster greater appreciation of natural resources among personnel and reduce demands on natural resources staff to provide information about Base resources.	Level 5	Sikes Act Improvement Act Fish and Wildlife Conservation Act NAVFACINST MO-100.4 OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73	2004
Increase coordination between SOUTHWESTDIV NAVFACENGCOM, NBVC Point Mugu Natural Resources staff, and Morale, Welfare, and Recreation (MWR) staff to expand and maintain recreational opportunities	This action is intended to expand leisure opportunities for staff.	Level 5	Sikes Act Improvement Act NAVFACINST MO-100.4 OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73	Ongoing

Table 9-1 Implementation Summary for INRMP Projects (continued)

Action ¹	Purpose	Priority	Requirement	Fiscal Year Goal
<i>Concentrated Outdoor Recreation Activities and Areas -NBVC Point Mugu</i>				
Relocate the campground near the beach area and lagoon farther west, upgrade existing nature trail, install interpretive signs focusing on wildlife and geology, establish a capacity cap and fees for camp sites	This action would protect sensitive species, increase recreation enjoyment, and increase understanding by visitors and personnel of the natural resources at this site.	Level 5	Sikes Act Improvement Act Fish and Wildlife Conservation Act NAVFACINST MO-100.4 OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73 Public Law 97-258	2002
Construct signs outlining fishing regulations, catch limits, general safety information	This action would assist in enforcing state fishing regulations.	Level 5	Sikes Act Improvement Act Fish and Wildlife Conservation Act NAVFACINST MO-100.4 OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73 10 USC 2671	2004

Table 9-1 Implementation Summary for INRMP Projects (continued)

Action ¹	Purpose	Priority	Requirement	Fiscal Year Goal
<i>Dispersed Outdoor Recreation Areas and Activities -NBVC Point Mugu</i>				
Add stops to the hunting blinds along the runways to prevent hunters from firing towards the runways	This action would reduce safety hazards from firing toward the runway.	Level 2	Sikes Act Improvement Act NAVFACINST MO-100.4 OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73 10 USC 2671	2003
Evaluate an increase of the hunting fees to be equivalent to CDFG public hunting rates and USFWS refuge fees of \$15/day	This action would provide funding to administer the hunting program and manage natural resources that are affected by the activity.	Level 2	Anti Deficiency Act Sikes Act Improvement Act NAVFACINST MO-100.4 OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73 Public Law 97-258	2005
<i>Special Interest Outdoor Recreation Areas and Activities - NBVC Point Mugu</i>				
Construct a Mugu Lagoon Visitor Education Center about wildlife and geology at the auto pullout on State Highway 1. Facilities would be expanded to include a staffed interpretive center and boardwalk	This action would be undertaken through cooperative efforts with National Park Service, Santa Monica Mountains National Recreation Area, CalTrans, and local agencies to expand the public's enjoyment and understanding of the Base's natural resources.	Level 2	16 USC 460 Sikes Act Improvement Act Fish and Wildlife Conservation Act NAVFACINST MO-100.4 OPNAVINST 5090.1B DODINST 4700.4 DODINST 4715.3 NAVFAC P-73	2004

¹ Proposed projects that are determined to have potential significant impacts on the military mission or on natural resources will undergo further environmental review before they are implemented.

APPENDIX B
SPECIES LIST

Species List

The following species list summarizes common and scientific names of plant, bird, mammal, amphibian, reptile, and invertebrate species mentioned in the text of this plan. For more comprehensive lists of plants and birds found at NBVC Point Mugu, refer to the Annotated Flora and Bird Census lists provided in Appendix E.

All citations referencing amphibian and reptile species were taken from the Annotated checklist of the amphibians and reptiles of California, second revised edition (Jennings, 1987).

All citations referencing avian species were taken from the most recent Supplement to the American Ornithologists' Union (A.O.U.) Check-list of North American Birds (American Ornithologists' Union, 1996). However, if scientific and common names, specifically subspecies designations, were not consistent with those designated by the U.S. Fish and Wildlife Service in Federal Register publications regarding endangered and threatened species the citations were taken from the appropriate Federal Register. For species not listed in the Federal Register subspecies designation comes from the most recent peer-reviewed scientific literature.

Citations referencing the common names of mammals were taken from Common Names of Mammals of the World. (Wilson, D.E., and Cole, R. 1993). However, if common names are not consistent with those designated by the U.S. Fish and Wildlife Service in Federal Register publications regarding endangered and threatened species the citations are to come from the appropriate Federal Register.

Citations referencing the scientific names of the mammals were taken from Mammals Species of the World: a Taxonomic and Geographic Reference, Second Edition (Wilson, D.E and Reeder, DM 2000). However, if scientific names, specifically subspecies designations, were not consistent with those designated by the U.S. Fish and Wildlife Service in Federal Register publications regarding endangered and threatened species the citations were taken from the appropriate Federal Register. For species not listed in the Federal Register subspecies designation comes from the most recent peer-reviewed scientific literature.

All citations referencing vegetation or plant species were taken from The Jepson Manual: Higher Plants of California (Hickman, 1993).

Species Common Name	Species Scientific Name
Plants	
alkali heath	<i>Frankenia salina</i>
alkali weed	<i>Cressa truxillensis</i>
arrow-grass	<i>Triglochin concinna</i>
Australian salt bush	<i>Atriplex semibaccata</i>
beach bursage	<i>Amdrosia chamissonis</i>
beach evening primrose or sun cup	<i>Camissonia cheiranthifolia</i>
beach morning glory	<i>Calystegia soldanella</i>
broad-leaved cattail	<i>Typha latifolia</i>
bulrush	<i>Scirpus californicus</i>
California cord grass	<i>Spartina foliosa</i>
California sagebrush	<i>Artemisia californica</i>
California wild rose	<i>Rosa californica</i>

Species Common Name	Species Scientific Name
Plants (continued)	
coastal live oak	<i>Quercus agrifolia</i>
ditchgrass	<i>Ruppia maritima</i>
eelgrass	<i>Zostera marina</i>
European beachgrass	<i>Ammophila arenaria</i>
German ivy	<i>Senecio mikanioides</i>
giant reed	<i>Arundo donax</i>
glasswort	<i>Salicornia subterminalis</i>
goldenbush	<i>Isocoma menziesii</i>
iceplant	<i>Mesembryanthemum crystallinum</i>
iceplant	<i>Mesembryanthemum nodiflorum</i>
jaumea	<i>Jaumea carnosa</i>
laurel sumac	<i>Rhus laurina</i>
lemonadeberry	<i>R. integrifolia</i>
mule fat	<i>Baccharis salicifolia</i>
mustard	<i>Brassica nigra</i>
myoporum	<i>Myoporum</i> spp.
narrow-leaved cattail	<i>Typha angustifolia</i>
pickleweed (1)	<i>Salicornia bigelovii</i>
pickleweed (2)	<i>Salicornia virginica</i>
salt bush	<i>Atriplex watsonii</i>
salt marsh bird's-beak	<i>Cordylanthus maritimus maritimus</i>
saltgrass	<i>Distichlis spicata</i>
saltwort	<i>Batis maritima</i>
sand verbena	<i>Abronia maritima</i>
sea lettuce	<i>Ulva</i> spp.
sea rocket	<i>Cakile maritima</i>
estuary sea-blite	<i>Suaeda esteroa</i>
shoregrass	<i>Monanthochloe littoralis</i>
southern cattail	<i>Typha domingensis</i>
spearscale	<i>Atriplex triangularis</i>
spiny rush	<i>Juncus acutus</i> ssp. <i>leopoldii</i>
tamarisk	<i>Tamarix parviflora</i>
western marsh rosemary	<i>Limonium californicum</i>
willow	<i>Salix</i> spp.
yerba mansa	<i>Anemopsis californica</i>
Mammals	
black-tailed jackrabbit	<i>Lepus californicus</i>
Brazilian free-tailed bat	<i>Tadarida brasiliensis</i>
brush mouse	<i>Peromyscus boylii</i>
cactus mouse	<i>Peromyscus eremicus</i>
California ground squirrel	<i>Spermophilus beechyi</i>
California sea lion	<i>Zalophus californianus</i>
California vole	<i>Microtus californicus</i>
coyote	<i>Canis latrans</i>
deer mouse	<i>Peromyscus maniculatus</i>
desert cottontail	<i>Sylvilagus audubonii</i>

Species Common Name	Species Scientific Name
Mammals (continued)	
dusky-footed woodrat	<i>Neotoma fuscipes</i>
house mouse	<i>Mus musculus</i>
house rat	<i>Rattus rattus</i>
kangaroo rat	<i>Dipodomys species</i>
long-tailed weasel	<i>Mustela frenata</i>
northern raccoon	<i>Procyon lotor</i>
opossum	<i>Didelphis virginianus</i>
Pacific harbor seal	<i>Phoca vitulina richardsi</i>
red fox	<i>Vulpes vulpes</i>
striped skunk	<i>Mephitis mephitis</i>
western harvest mouse	<i>Reithrodontomys megalotis</i>
Birds	
American avocets	<i>Recurvirostra americana</i>
Belding's savannah sparrow	<i>Passerculus sandwichensis beldingi</i>
black skimmer	<i>Rynchops niger</i>
black-crowned night heron	<i>Nycticorax nycticorax</i>
black-necked stilt	<i>Himantopus mexicanus</i>
brown-headed cowbird	<i>Malothrus ater</i>
California brown pelican	<i>Pelicanus occidentalis</i>
California least tern	<i>Sterna antillarum browni</i>
great blue heron	<i>Ardea herodias</i>
great egret	<i>Ardea alba</i>
greater yellowlegs	<i>Tringa melanoleuca</i>
horned lark	<i>Eremophila alpestris</i>
house finch	<i>Carpodacus mexicanus</i>
killdeer	<i>Charadrius vociferus</i>
least Bell's vireo	<i>Vireo bellii pusillus</i>
light-footed clapper rail	<i>Rallus longirostris levipes</i>
little blue heron	<i>Egretta caerulea</i>
loggerhead shrike	<i>Lanius ludovicianus</i>
long-billed curlew	<i>Numenius americanus</i>
marbled godwit	<i>Limosa fedoa</i>
mourning dove	<i>Zinada macroura</i>
northern harrier	<i>Circus cyaneus</i>
peregrine falcon	<i>Falco peregrinus anatum</i>
raven	<i>Corvus corax</i>
reddish egret	<i>Egretta rufescens</i>
red-tailed hawk	<i>Buteo jamaicensis</i>
red-winged blackbird	<i>Agelaius phoeniceus</i>
short-eared owl	<i>Asio flammeus</i>
snowy egret	<i>Egretta thula</i>
song sparrow	<i>Melospiza melodia</i>
turkey vulture	<i>Cathartes aura</i>
tricolored heron	<i>Egretta Tricolor</i>
western meadowlark	<i>Sturnella neglecta</i>
western snowy plover	<i>Charadrius alexandrinus nivosus</i>
white-tailed kite	<i>Elanus leucurus</i>
willet	<i>Catoptrophorus semipalmatus</i>

Species Common Name	Species Scientific Name
Amphibians & Reptiles	
California kingsnake	<i>Lampropeltis getulus californiae</i>
Pacific diamond-back rattlesnake	<i>Crotalus atrox</i>
San Diego gopher snake	<i>Pituophis melanoleucus annectens</i>
side-blotched lizard	<i>Uta stansburiana</i>
Fish	
arrow goby	<i>Clevelandia ios</i>
arroyo chub	<i>Gila orcutti</i>
barred sand bass	<i>Paralabrax nebulifer</i>
barred surfperch	<i>Amphistichus argenteus</i>
bay blenny	<i>Hypsoblennius gentiles</i>
bay pipefish	<i>Syngnathus leptorhynchus</i>
black surfperch	<i>Embiotoca jacksoni</i>
brown rockfish	<i>Sebastes auriculatus</i>
California halibut	<i>Paralichthys californicus</i>
California killfish	<i>Fundulus parvipinnis</i>
California tonguefish	<i>Symphurus atricauda</i>
common carp	<i>Cyprinus carpio</i>
curly dock	<i>Rumex crispus</i>
deepbody anchovy	<i>Anchoa compressa</i>
diamond turbot	<i>Hypsopsetta guttulata</i>
giant kelpfish	<i>Heterostichus rostratus</i>
grey smoothhound shark	<i>Mustelus californicus</i>
kelp bass	<i>Paralabrax clathratus</i>
kelp rockfish	<i>Sebastes atrovirens</i>
kelpfish	<i>Gibbonsia</i> spp.
leopard shark	<i>Triakis semifasciata</i>
longjaw mudsucker	<i>Gillichthys mirabilis</i>
opaleye	<i>Girella nigricans</i>
Pacific herring	<i>Clupea harengus</i>
Pacific staghorn sculpin	<i>Leptocottus armatus</i>
round stingray	<i>Urolophus halleri</i>
shiner surfperch	<i>Cymatogaster aggregata</i>
shovelnose guitarfish	<i>Rhinobatos productus</i>
speckled sanddab	<i>Citharichthys stigmaeus</i>
specklefin midshipman	<i>Porichthys myriaster</i>
spotted turbot	<i>Pleuronichthys ritteri</i>
starry flounder	<i>Platichthys stellatus</i>
striped mullet	<i>Mugil cephalus</i>
threadfin shad	<i>Dorosoma petenense</i>
topsmelt	<i>Atherinops affinis</i>
western mosquitofish	<i>Gambusia affinis</i>
Invertebrates	
California horn snail	<i>Cerithidea californica</i>
crabs (1)	<i>Pachygrapsus</i>
crabs (2)	<i>Hemigrapsus</i>
dinoflagellates	<i>Gymnodinium</i> spp.
false mya	<i>Cryptomya californica</i>
fiddler crab	<i>Uca pugnax</i>
filamentous blue-green algae	<i>cyanophytes</i>

Species Common Name	Species Scientific Name
Invertebrates (continued)	
Gabb's tiger beetle	<i>C. gabbi</i>
ghost shrimp	<i>Callinassa californiensis</i>
globose dune beetle	<i>Coelus globose</i>
jackknife clam	<i>Tagelus californicus</i>
lined shore crab	<i>Pachygrapsus crassipes</i>
littleneck clam	<i>Protothaca staminea</i>
mudflat tiger beetle	<i>Cincindela trifasciata sigmoidea</i>
purple-hinged clam	<i>Sanguinolaria nuttalli</i>
rove beetle	<i>Staphylinidae, Genus Bledius</i>
salt marsh gastropod	<i>Cerithidea</i> spp.
sand dollar	<i>Dendroaster excentricus</i>
snail (1)	<i>Assiminea</i>
snail (2)	<i>Melampus</i>
tiger beetle	<i>Cincidela</i>
water boatmen	<i>Trichocorixia</i> spp.
yellow shore crabs	<i>Hemigrapsus oregonensis</i>

APPENDIX C

RECORD OF NONAPPLICABILITY (RONA)

Record of Non-Applicability

Department of Defense

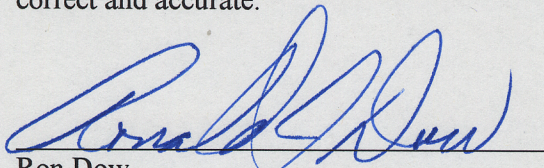
Department of the Navy

Record of Non-Applicability

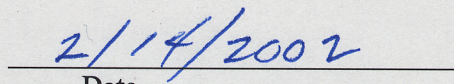
Naval Base Ventura County, Point Mugu, California
Integrated Natural Resources Management Plan

Pursuant to Section 176 (c) of the Clean Air Act, as amended by the 1990 amendments; the General Conformity Rule at 40 CFR Parts 51 and 93; and the Chief of Naval Operations Draft Interim Guidance on Compliance with the Clean Air Act Conformity Rule (CNO Guidance), the Department of Navy (DON) determined that the activities as outlined in the Integrated Natural Resources Management Plan (INRMP) are exempt from conformity requirements in accordance with sections 40 CFR 93.153 (c) (2) (iv), (vii), (x), (xii), and (xiii) and the corresponding sections of the CNO Guidance. The INRMP outlines many routine maintenance activities that would result in no emission increase or an increase that is clearly *de minimis*. Weed control and new construction activities, such as new interpretive trails, are also expected to be *de minimis*, however, specific analysis would be performed to verify that emissions do not exceed *de minimis* levels when specific actions are proposed. Consequently, the proposed action is exempt from the conformity determination requirements of the Environmental Protection Agency's conformity rule.

To the best of my knowledge, the information contained in this Record of Non-Applicability is correct and accurate.



Ron Dow
Director, Environmental Division
By Direction of the Commanding Officer



Date

