Integrated Natural Resources Management Plan

for

Naval Base Ventura County,
San Nicolas Island, California

December 2010

Integrated Natural Resources Management Plan

Naval Base Ventura County,
San Nicolas Island, California

December 2010

Contract No: N62473-06-D-2402/0011

Prepared for:

Naval Base Ventura County
San Nicolas Island
Environmental Division
Point of Contact: Martin Ruane, Ecologist, martin.ruane@navy.mil

Under Contract with:

NAVFAC
Naval Facilities Engineering Command

Naval Facilities Engineering Command, Southwest
Coastal Integrated Products Team
2739 McKean St. Bldg. 291
San Diego, CA 92101
Contract No: N62473-06-D-2402/0011

Points of Contact: Michelle Cox, Natural Resource Specialist michelle.c.cox@navy.mil

Prepared by:

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INCORPORATED

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INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN
Naval Base Ventura County
Naval Outlying Landing Field, San Nicolas Island, California

APPROVAL

This Integrated Natural Resources Management Plan (INRMP) was prepared and reviewed in coordination with the Department of the Navy and California Department of Fish and Game South Coast Region in accordance with the 2006 Memorandum of Understanding for a Cooperative Integrated Natural Resource Management Program on Military Installations. The U.S. Department of the Interior, Fish and Wildlife Service concurs that the INRMP will provide a framework to manage natural resources on Naval Base Ventura County Naval Outlying Landing Field San Nicolas Island.

For Plan Period: 2010 - 2030

Concurring Agency - U.S. Fish and Wildlife Service

Diane k Noda

Diane Noda
Field Supervisor
U.S. Fish and Wildlife Service
Ventura, California

3/10/2011
Date

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For Plan Period: 2010 - 2030

Concurring Agency - U.S. National Marine Fisheries Service

Rodney R McInnis

Rod Mc Innis
Regional Administrator
Southwest Regional Office
National Marine Fisheries Service
Long Beach, California

1-31-11

Date

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For Plan Period: 2010 - 2030

Approving Official - U.S. Navy Naval Facilities Engineering Command

Edith A. Jacobsen
Natural and Cultural Resources Lead
Southwest Division
Naval Facilities Engineering Command
San Diego, California

2 FEB 2011
Date

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For Plan Period: 2010 - 2030

Approving Official - U.S. Navy Naval Base Ventura County

James J. McHugh
Captain, U.S. Navy
Commanding Officer
Naval Base Ventura County
Ventura, California

12/16/10
Date

State of California -The Natural Resources Agency
DEPARTMENT OF FISH AND GAME
1416 9th Street, 12th Floor
Sacramento, CA 95814
http://www.dfg.ca.gov

EDMUND G. BROWN, Jr, Governor
JOHN McCAMMAN, Director

May 23, 2011

J. J. McHugh
Captain, U.S. Navy
Commanding Officer
Department of the Navy
Naval Base Ventura County
311 Main Road, Suite 1
Point Mugu, CA 93042-5033

Re: Integrated Natural Resources Management Plan for Naval Base Ventura County, Naval Outlying Landing Field San Nicolas Island, California

Dear Captain McHugh:

You requested the Department of Fish and Game (Department) to review the updated Integrated Natural Resources Management Plan for San Nicolas Island (INRMP). You also asked the Department to concur in writing that "this INRMP will provide a framework to manage natural resources on Naval Base Ventura County Naval Outlying Landing Field San Nicolas Island."

The Department agrees with the above statement, and also commends Naval Base Ventura County (Naval Base) for working closely with the Department and other stakeholders to develop the INRMP, as the federal Sikes Act requires. At the same time, while the INRMP addresses most of the Department's concerns regarding the conservation, protection, and management of fish and wildlife resources on San Nicolas Island, in the Department's opinion, it still does not go far enough to prevent island foxes from being injured or killed in leghold traps used on the island to control feral cats. The Department is particularly interested in protecting island foxes because they are a threatened species under the California Endangered Species Act.

The Department supports the Naval Base's efforts to control feral cats in order to protect the island's bird populations, but as we proposed previously, the Naval Base should use box traps or other types of non-body gripping traps that would not injure or kill island foxes. The Department appreciates the Naval Base's decision to substitute steel-jawed leghold traps for padded-jaw leghold traps, but the use of such traps could still injure or kill island foxes and other non-target species.

The Department also recommended that if the Naval Base were to continue to use leghold traps to control feral cats, it should at least inspect its traps more frequently to better protect island foxes. Unfortunately, the Naval Base did not accept our recommendation.

While the Department is disappointed with the Naval Base's decision to continue using leghold traps and not increase its inspection efforts for the present time, it presumes the Naval Base's offer to consider the Department's trapping protocols in the future is sincere. Such protocols would include more frequent trap inspections and timely reporting (i.e., within 48 hours) to the Department's South Coast Region office of any island fox injuries or deaths. The Department also looks forward to further discussion on this topic during the Annual Coordination meetings with the Naval Base, as described in the INRMP. Please contact Ed Pert, Regional Manager, South Coast Region, at (858) 467-4210 or epert@dfg.ca.gov to schedule the meetings.

In closing, notwithstanding the Department's specific concerns regarding the island fox, we appreciate the Navy's efforts to work with us and other stakeholders to conserve, protect, and manage fish and wildlife resources on San Nicolas Island, as well as other Navy facilities in California. The Department looks forward to continuing our partnership.

Sincerely,

John McCamman
Director

cc: Martin Ruane
Environmental Division, PRV 42
Naval Base Ventura County
311 Main Road, Suite 1
Point Mugu, CA 93042-5033

Edmund Pert
Regional Manager
South Coast Region
4949 Viewridge Avenue
San Diego, CA 92123

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For Plan Period: 2010 - 2030

ANNUAL NAVAL BASE VENTURA COUNTY

REVIEW AND APPROVAL

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For Plan Period: 2010 - 2030

ANNUAL NAVAL FACILITIES ENGINEERING COMMAND

REVIEW AND APPROVAL

Plan Period	Date of Annual Installation and Review	Name and Title of Reviewer(s)
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For Plan Period: 2010 - 2030

ANNUAL U.S FISH AND WILDLIFE SERVICE

REVIEW AND APPROVAL

Plan Period	Date of Annual Installation and Review	Name and Title of Reviewer(s)
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For Plan Period: 2010 - 2030

ANNUAL NATIONAL MARINE FISHERIES SERVICE

REVIEW AND APPROVAL

Plan Period	Date of Annual Installation and Review	Name and Title of Reviewer(s)
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For Plan Period: 2010 - 2030

ANNUAL CALIFORNIA DEPARTMENT FISH AND GAME

REVIEW AND APPROVAL

Plan Period	Date of Annual Installation and Review	Name and Title of Reviewer(s)
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Executive Summary

This Integrated Natural Resources Management Plan (INRMP) is to provide Naval Base Ventura County (NBVC) San Nicolas Island (SNI) with a basis and criteria for sound use and management of natural resources that is integrated with its U.S. Navy mission. The Sikes Act Improvement Act (SAIA) of 1997 committed the U.S. Department of Defense to prepare and implement INRMPs for its installations. This INRMP will be used to manage all of SNI lands, and adjacent waters of the nearshore environment including all marine waters surrounding the island within the 300-foot (91 meter [m]) isobath or 1.0 nautical mile (nm) (1.9 kilometers [km]) distance from shore, whichever is greater.

The most isolated of the eight major Channel Islands, SNI is located in the Southern California Bight, a recessed curve in the southwestern California coastline from Point Conception in Santa Barbara County to just south of the Mexican border. San Nicolas Island lies 68 miles (109 km) south-southwest of Ventura, California, and about 62 miles (98 km) southwest of Point Mugu, California.

San Nicolas Island is separated by deep ocean channels from the other Channel Islands in the chain. The island is oriented west-northwest to east-southeast, is oval shaped, and is about nine miles (14 km) long and 3.6 miles (5.8 km) wide. San Nicolas Island presents a low, table-like profile with topography dominated by a broad terrace or mesa with no distinctive peaks. The Navy owns the island to the mean high water mark, an area that encompasses approximately 14,258 acres (5,772 hectares) and the highest elevation on SNI is 908 feet (277 m) at Jackson Peak. In general, the island exhibits sparse vegetation and subsequent erosion. This poor vegetation cover is mostly attributable to past sheep ranching, the island's arid climate, and high winds.

In 1933, SNI was transferred to the U.S. Navy by an Executive Order of President Hoover. In November 1942, the U.S. Army was given temporary jurisdiction over the island and intended to base an air observation squadron, however, the U.S. Army never stationed such a squadron there. San Nicolas Island was returned to the U.S. Navy following the end of World War II and in 1947, the island came under the control of the Naval Air Station (NAS) at Point Mugu as part of the Naval Air Missile Test Center. The Naval facilities at SNI support the mission of the Naval Air Warfare Center Weapons Division (NAWCWD) Point Mugu Sea Range (PMSR), which controls 36,000 square miles (93,240 square km) of Special Use Airspace over the Pacific Ocean. The PMSR parallels the California coastline for about 200 miles (322 km) and extends seaward for more than 180 nm (333 km).

San Nicolas Island's primary mission is to support the Research Development Assessment Testing and Evaluation of air weapons and associated aircraft systems in strike, anti-surface, and anti-air warfare aircraft within the NAWCWD PMSR. In support of this mission, SNI serves two primary functions (1) as a launch platform for short and medium missile testing, and (2) as an observation facility for missile testing.

Consistent with the INRMP management goals, the 2010 INRMP Revision proposes the following conservation and stewardship measures:

- Sustainability principles for the management of natural resources and the built environment;

- Development, implementation, and updates for resource management plans;
- Continue existing studies and surveys and the development of new studies and surveys in the terrestrial and marine environment;
- Establishment of a central clearinghouse for data, reports, and publications pertaining to the NBVC's Environmental Management System (EMS) that addresses natural resources;
- Encourage participation in regional, interagency premierships; and
- Improve SNI community and environmental outreach.

Projects and activities for SNI that are intended to support these conservation and stewardship measures are categorized according to the following broad management categories: ecosystem approach, the physical and chemical environment, habitats and communities, fish and wildlife management, special status species, invasive species, prevention and control of wildlife damage, data integration-access-reporting, sustainability of the military mission in the natural environment, construction and facility maintenance, communication towers and wind farms, beneficial partnerships and collaborative resource planning, public access and outreach, consistency with other plans, National Environmental Policy Act (NEPA) compliance, remediation of contaminated sediments, oil spill or hazardous substance prevention and cleanup, cumulative effects, natural resource consultation requirements, landscaping and grounds maintenance, outdoor recreation, and environmental education.

Ecosystem Approach

- Apply sustainability principles to the management of habitats, species, and ecological functions on SNI by identifying resource specific best practices similar to Sustainable Sites Initiatives approaches.

The Physical and Chemical Environment

- Revise and implement the storm water pollution prevention plan and water quality protection efforts throughout the SNI watershed.
- Develop and implement an erosion control plan.
- Develop and implement a wildland fire management plan.

Habitats and Communities

- Inventory plant species diversity, abundance, and density to develop priorities for monitoring that establishes ranking system, sensitive species habitat, and creates criteria for restoration work while defining the extent, nature, and value of vegetation resources.
- Develop and implement a dune drift management plan to determine effective alternatives to manage dune drift impact to roads, operations, and natural resources.
- Maintain a current inventory of wetlands to support planning and management efforts to achieve no net loss of wetlands.
- Collect baseline information and establish monitoring protocols for sandy beach communities to support management to maintain habitat integrity.
- Continue rocky intertidal surveys and encourage additional monitoring at SNI consistent with monitoring performed at the other Channel Islands and throughout California, to establish regional trends and understand site specific change.
- Design and implement unvegetated and vegetated soft bottom monitoring protocols at SNI to determine resource status and extent of submerged aquatic vegetation (eelgrass).
- Support establishment of kelp forest ecosystem monitoring locations around SNI while encouraging state and federal agencies and academic researchers to investigate important community related questions involving recruitment, disturbance, and species diversity that help to assess regional trends.
- Develop management strategies through partnerships with the Bureau of Land Management to support the management of the Begg Rock State Marine Reserve and the offshore rocks near SNI and Begg Rock that are designated as part of the California Coastal National Monument.

Fish and Wildlife Management

- Collect baseline information on the invertebrate community of SNI, with particular emphasis on endemics and pollinators.
- Conduct regular monitoring of reptiles and amphibians in addition to island night lizard (*Xantusia riversiana*) monitoring and develop accurate geographic information system (GIS) data layers for known populations and conserve habitat associations to avoid sensitive areas and minimize potential impacts.
- Migratory and resident bird inventory and restoration management activities to conserve bird population and develop and maintain information on status and trend of population and habitats.
- Monitor resident seabird populations and breeding colonies to track the sustainability of populations and their habitat.
- Support small mammal monitoring programs at SNI to adapt management strategies based on current population status.
- Develop and implement a marine resource stewardship plan that focuses on marine invertebrates.
- Develop a fish monitoring program and management plan to conserve fish population abundance and habitat diversity.
- Monitor island wide pinniped breeding and haul out sites and periodic evaluation of current adaptive management practices.

Special Status Species

- Ensure that land use plans and activities in or near threatened or endangered species habitats are accomplished in accordance with the Endangered Species Act (ESA) in accordance with current Biological Opinions (BOs) and with ESA Section 7 Consultation Handbook.
- Per U.S. Fish and Wildlife Service (USFWS) BO 1-8-01-F-14 provide the USFWS an annual report containing the number of island night lizards and Western snowy plover killed or injured by Navy activities, and a summary of Navy activities and their effects on listed species in accordance with the Reporting Requirements.
- Support recovery plan efforts to establish stable island night lizard populations and eventual delisting by conducting site specific surveys prior to disturbance activities, implementing avoidance and minimization measures, and conducting studies to investigate the effectiveness of island night lizard management strategies with respect to impacts from southern alligator lizard (*Elgaria multicarinata*) and the relocation of island night lizards.
- Support recovery plan efforts to establish stable western snowy plover (*Charadrius alexandrinus nivosus*) populations and eventual delisting by closing nesting areas to recreational activity during the March 1 - September 15 breeding season and by removing unnecessary structures in nesting areas.
- Support recovery plan efforts to establish stable western snowy plover populations and eventual delisting by monitoring the effects of Navy activities on snowy plovers through conducting island-wide snowy plover censuses twice annually, once during the breeding season and once during the winter season, and through monitoring snowy plover nests during missile or target launches, general operations, and other activities that may disturb nesting behaviors.
- Support recovery plan efforts to establish stable black abalone (*Haliotis cracherodii*) populations through continuing to conduct presence and absence surveys and through developing and implementing annual abalone monitoring protocols.
- Continue to support appropriate closures at SNI and continue to review all military activities to ensure that they are in compliance with ESA and to avoid or minimize impacts to black abalone.
- Support recovery plan efforts to establish stable white abalone (*Haliotis sorenseni*) populations by facilitating efforts to identify white abalone habitat and determine densities of individuals around SNI.

- Support ongoing and new research on distribution and ecology of the Guadalupe fur seal (*Arctocephalus townsendi*). Encourage academic institutions to collect resource data. Record all sightings of Guadalupe fur seals and develop a database to track numbers of individuals, time of year, and location.
- Provide for the recovery, enhancement, and protection of species warranting Navy stewardship, as a proactive strategy to prevent federal listings and continue to resolve baseline biological data gaps.
- Collect data on the habitat and reproductive requirements for sensitive endemic plants species for conservation and management efforts.
- Collect baseline information on the special status native invertebrate species of SNI.
- Provide for the recovery, enhancement, and protection of Xantus's murrelets (*Synthliboramphus hypoleucus*) and ashy storm-petrels (*Oceanodroma homochroa*), as a proactive strategy to prevent federal listings and continue to resolve baseline biological data gaps.
- Maintain a viable population of the San Nicolas Island fox (*Urocyon littoralis dickeyi*) by reducing negative, human-caused impacts and remaining an active participant with other agencies regarding island fox issues.
- Determine the status of San Nicolas Island deer mouse (*Peromyscus maniculatus exterus*) populations and conserve and protect deer mouse habitat.
- Support ongoing and new research on distribution and ecology of the southern sea otter (*Enhydra lutris nereis*) at SNI. Encourage academic institutions to facilitate resource data collection and record all sightings of southern sea otters at SNI and develop a database to track numbers of individuals, time of year, and location.

Invasive Species

- Update and implement the invasive non-native plant species management and eradication program to insure use of existing Best Management Practices to reduce the introduction of invasive species, establish early detection and rapid response protocol, map and prioritize most problematic terrestrial invasive non-native species populations, and maintain consistency with long-term protection of native plant communities.
- Develop and implement a biosecurity plan to ensure invasive terrestrial fauna and flora are not brought to SNI by providing prevention, early detection, rapid response, and education guidelines.
- Assess and monitor the progress and success of the removal of feral cats to support the shorebird enhancement project.
- Develop and implement a plan to prevent the introduction of invasive non-native marine and coastal species into SNI waters which includes a standardized monitoring system focused on early detection for high priority aquatic invasive species, rapid response protocol, and promotes control and management when an invasive is detected. Promote cooperative interagency efforts to collect and analyze comprehensive monitoring data.

Prevention and Control of Wildlife Damage

- Survey and monitor avian species utilizing airfield and document bird strikes and carcasses adjacent to airfield.
- Develop and implement a Bird/Wildlife Aircraft Strike Hazard Plan and conduct a Wildlife Hazard Assessment for SNI.
- Minimize the introduction of pest species to SNI. Develop a rodent control/removal plan and implement if introduced species are detected. Determine presence or absence of non-native rodents.

Data Integration, Access, and Reporting

- Set up a central clearinghouse for data, reports, and publications pertaining to the NBVC's EMS that addresses natural resources and that is accessible to staff.

Sustainability of the Military Mission in the Natural Environment

- Control and reduce greenhouse gas emissions by improving governance, implementing the SNI Net Zero Energy Installation Plan, providing energy conservation education, and addressing impacts in NEPA documents.
- Promote training in sustainable design criteria for Navy staff and apply sustainability principles to the management of natural resources and the built environment by using metrics (indicators) of sustainability and by adopting Leadership in Energy and Environmental Design, Low Impact Development, and Sustainable Sites Initiative approaches while continuing to use Regional Shore Infrastructure Planning, master planning, site approval, and NEPA processes.

Construction and Facility Maintenance

- Develop and implement an island road long-term maintenance plan that updates and improves road maintenance best management practices, applies the principles of "Integrated Vegetation Management," and adopts mowing instructions to meet multiple objectives for roadside maintenance to alleviate harmful environmental impacts and enhance possible benefits.

Communication Towers and Wind Farms

- Ensure siting criteria are addressed through the Project Review Board and ensure that any proposed towers will comply with USFWS guidelines for reducing fatal bird strikes to the greatest extent practicable.

Beneficial Partnerships and Collaborative Resource Planning

- Participate in conservation, ecosystem, invasive species, and feral animal control planning in collaboration with other government agencies.
- Seek out and encourage partners to support independent scientific research and to develop cooperative research agreements focused on examining marine recruitment processes of important indicator species or species of concern.
- Remain an active participant with other agencies regarding San Nicolas Island fox and San Nicolas Island deer mouse issues.
- Support the integration of SNI into the Invasive Species Task Force on Santa Cruz Island and other Channel Islands as opportunities arise.
- Promote cooperative interagency efforts to collect and analyze comprehensive aquatic invasive species monitoring data, including shared funding and staff.
- Consult with USFWS and the California Department of Fish and Game at least annually to fulfill SAIA provisions and related inter-agency cooperative agreements.
- Consider the use of Cooperative Agreements to get work done, especially research. A long-term advisory relationship and cooperative research relationship could continue with local universities.

Public Access and Outreach

- Establish and implement clear, coherent policies regarding public access to SNI including the near shore environment. Take active measures to discourage trespass and minimize the impacts of unauthorized access.
- Identify natural resource themes for public outreach.
- Participate in Earth Day and annual science festivals that occur in adjacent communities on the mainland.

Consistency with Other Plans

- Ensure consistency with Coastal Zone Plans.
- Continue to participate in the Project Review Board and the Site Approval and Project Review process and coordinate with the Cultural Resources program.

NEPA Compliance

- Continue to use NEPA planning processes and documentation to guide specific projects and document choices and enforce mitigation measures proposed in those NEPA documents.

Remediation of Contaminated Sediments

- Collect and distribute data on sediment contamination to minimize risks to recreational and commercial water contact users, recreational and commercial fisheries, and to wildlife species.

Oil Spill or Hazardous Substance Prevention and Cleanup

- Integrate INRMP protection priorities into the Emergency Response Action Plan and the Integrated Contingency Plan for Oil and Hazardous Substance Spill Prevention and Response.

Cumulative Effects

- Support research to improve the adequacy of cumulative effects analysis, standardize the format in documents, and develop and implement compensation for cumulative effects.

Natural Resource Consultation Requirements

- Implement and apply the INRMP as an initial screen for review of projects proposed on the installation from both Navy and outside interests to improve the success of mitigation and enhancement projects based on regulatory, functional, and ecosystem criteria.
- Enforce Seasonal Avoidance Measures and Standard Mitigation Measures.

Landscaping and Grounds Maintenance

- Develop, implement and revise as needed a landscaping and grounds maintenance plan and instruction that outlines an appropriate landscaping and grounds maintenance program to deal with pest problems.

Outdoor Recreation

- Develop, implement, and update as needed an outdoor recreation plan that identifies and evaluates suitable outdoor recreation opportunities for installation personnel in undeveloped areas and that continues to limit public access and outdoor recreation that are not consistent with the military mission at SNI.

Environmental Education

- Improve SNI community and environmental outreach through facilitating development of environmental education curriculum for researchers, personnel, and contractors. This will be accomplished by developing and distributing educational material, expanding education partnerships, by securing long-term funding to continue environmental education programs (e.g. brochures and videos), and evaluate the effectiveness of existing environmental education programs.

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1.0 Introduction

1.1 Purpose and Scope

In general, the purpose of an Integrated Natural Resources Management Plan (INRMP) is to help installation commanders manage natural resources more effectively so as to ensure that installation land and waters remain available and in good condition to support the military mission. Designed to facilitate both stewardship and compliance with natural resource laws in the context of military mission requirements, this INRMP integrates natural resource components of existing San Nicolas Island (SNI) plans, environmental documents, and the requirements of all applicable U.S. Department of Defense (USDOD), U.S. Department of the Navy (USDON), and installation regulations and guidelines.

The purpose of this INRMP is to provide a viable and implementable framework for the management of natural resources at Naval Base Ventura County (NBVC), California, SNI. Required by the Sikes Act Improvement Act (SAIA) of 1997 (as amended) for USDOD, an INRMP is the primary means by which natural resources compliance and stewardship priorities are set, and funding requirements are determined. A commitment to implement priority projects, as funding permits, comes with the signatures in the front of this INRMP.

The SAIA stipulates that this INRMP provide for:

- Conservation and rehabilitation of natural resources;
- Sustainable, multipurpose use of resources;
- Public access that is necessary and appropriate for the use described above, subject to safety and military security requirements;
- Specific natural resource goals and objectives, and time frames for acting on them;
- Fish and wildlife management, land management, and forest management;
- Fish and wildlife habitat enhancement or modifications;
- Wetlands protection, enhancement, and restoration where necessary for support of fish, wildlife, or plants;
- Integration of and consistency among various activities conducted under the INRMP;
- Sustainable use by the public of natural resources to the extent that use is not inconsistent with needs of the fish and wildlife resources;
- Enforcement of natural resource laws and regulations;
- No net loss in the capability of the military installation lands to support the military mission of the installation; and
- Such other activities as the Secretary of the Navy (SECNAV) determines appropriate.

By direction of the Office of the Undersecretary of Defense (OUSD) Memorandum of 08 August 1994, *Implementation of Ecosystem Management in the Department of Defense,* INRMPs are required to ensure that ecosystem management is the basis for all future management of USDOD lands and waters. Based on an ecosystem approach, this INRMP takes a large geographic view to ensure the overriding purpose of protecting the properties and functions of natural ecosystems (USDOD Instruction [INST] 4715.3,

Environmental Conservation Program). Terrestrial resource management of SNI is a unique scenario where the ecosystem boundary is synonymous with Navy property ownership. However, marine resource management of SNI's nearshore waters is interrelated with regional management issues for the Southern California Bight (SCB). When installation managers are confronted with the challenges and opportunities of regional ecosystem issues they are encouraged to form cooperative partnerships with resource management agencies, as appropriate, and take part in public awareness initiatives in an effort to manage ecosystems more successfully. The OUSD Memorandum provides principles and guidelines for implementing ecosystem management on USDOD lands. This includes participation in regional ecosystem initiatives.

Integrated Natural Resources Management Plans, as formalized under SAIA, are developed jointly by the U.S. Navy, fish and wildlife agencies such as the California Department of Fish and Game (CDFG), U.S. Fish and Wildlife Service (USFWS), National Oceanic and Atmospheric Administration (NOAA), National Marine Fisheries Service (NMFS), and other resource agencies as appropriate. Mutual agreement from these agencies is sought for the fish and wildlife component of natural resources management identified in the INRMP, and an annual review with the agencies discussing Navy-wide natural resources is mandatory.

This Revision was undertaken primarily due to the need to update the resource goals and objectives of NBVC SNI identified in the previous INRMP (USDON 2005). Some legal requirements have changed, such as guidelines for complying with the Magnuson-Stevenson Fisheries Conservation and Management Act and associated habitat conservation provisions for Essential Fish Habitat (EFH). Other regulatory changes, which were not addressed in the previous INRMP, are the Final Rule listing the black abalone *(Haliotis cracherodii)* as Endangered under the Endangered Species Act (ESA) (74 Federal Register [FR] 1937) and the Final Rule removing the brown pelican (*Pelecanus occidentalis*) from the Federal List of Endangered and Threatened Wildlife (74 FR 59443). Further changes have occurred in the way water quality matters are managed in nearshore waters of SNI, and in USDOD guidance on INRMP content.

The U.S. Navy and SNI will implement recommendations in this INRMP within the framework of regulatory compliance, national U.S. Navy mission obligations, anti-terrorism and force protection limitations, and funding constraints. All actions contemplated in this INRMP are subject to the availability of funds properly authorized and appropriated under federal law. Nothing in this INRMP is intended to be nor must be construed to be a violation of the Anti-Deficiency Act (31 U.S. Code [USC] 1341 *et seq.*).

1.2 Authority

The Sikes Act directs the USDOD to take the appropriate management actions necessary to protect and enhance the land and water resources on all installations under its control. USDOD Directive (DIR) 4700.4, *Natural Resources Management Program* and USDODDIR 4715.3, *Environmental Conservation Program,* have been implemented to establish fundamental land management policies and procedures for all military lands to preserve the military mission, but at the same time protect the natural resources. Naval Facilities Engineering Command (NAVFAC) MO-100.1 (Maintenance Operating Manual, *Natural Resources Land Management*) provides basic technical guidance for land management practices of all USDOD land and water resources. Also under NAVFAC is the Natural Resources Management Procedure Manual (NAVFAC P-73) which also instructs on how to develop an INRMP and on its content. Naval Operations Instruction (OPNAVINST) 5090.1C, *Environmental and Natural Resources Program Manual, October 2007 Chapter 24 Natural Resources Program,* further establishes program responsibilities and standards for complying with resource protection laws, regulations and Executive Orders (EOs) to conserve and manage natural resources on Navy installations in the U.S. and its territories and possessions. Finally, the U.S Navy Chief of Naval Operations (CNO) INRMP Guidance for Navy Installations, *How to Prepare, Implement, and Revise INRMPs, April 2006* supplies guidelines on the process and procedure for developing an INRMP.

Federal and state legal requirements that are the primary drivers for natural resources management are listed in Appendix B (USC, Public Laws [PL], EOs, and Code of Federal Regulations [CFR]).

Organization of this INRMP is consistent with the 2006 USDOD Template for INRMPs (USDOD 2006). Since Navy guidance (both CNO Guidance of April 2006, and OPNAVINST 5090.1C) is more comprehensive than that identified in the USDOD Template, the outline has been re-worked so that additional material is added in the document to ensure compliance with all guidelines (USDON 2006b, 2007a; USDOD 2006).

1.3 Location and Planning Footprint

The most isolated of the eight major Channel Islands, SNI is located in the SCB, a recessed curve in the southwestern California coastline from Point Conception in Santa Barbara County to just south of the Mexican border. San Nicolas Island lies 68 miles (109 kilometers [km]) south-southwest of Ventura, California, and about 62 miles (98 km) southwest of Point Mugu, California. It is in the southern Channel Island subgroup of four islands (San Clemente, Santa Barbara, Santa Catalina, and San Nicolas).

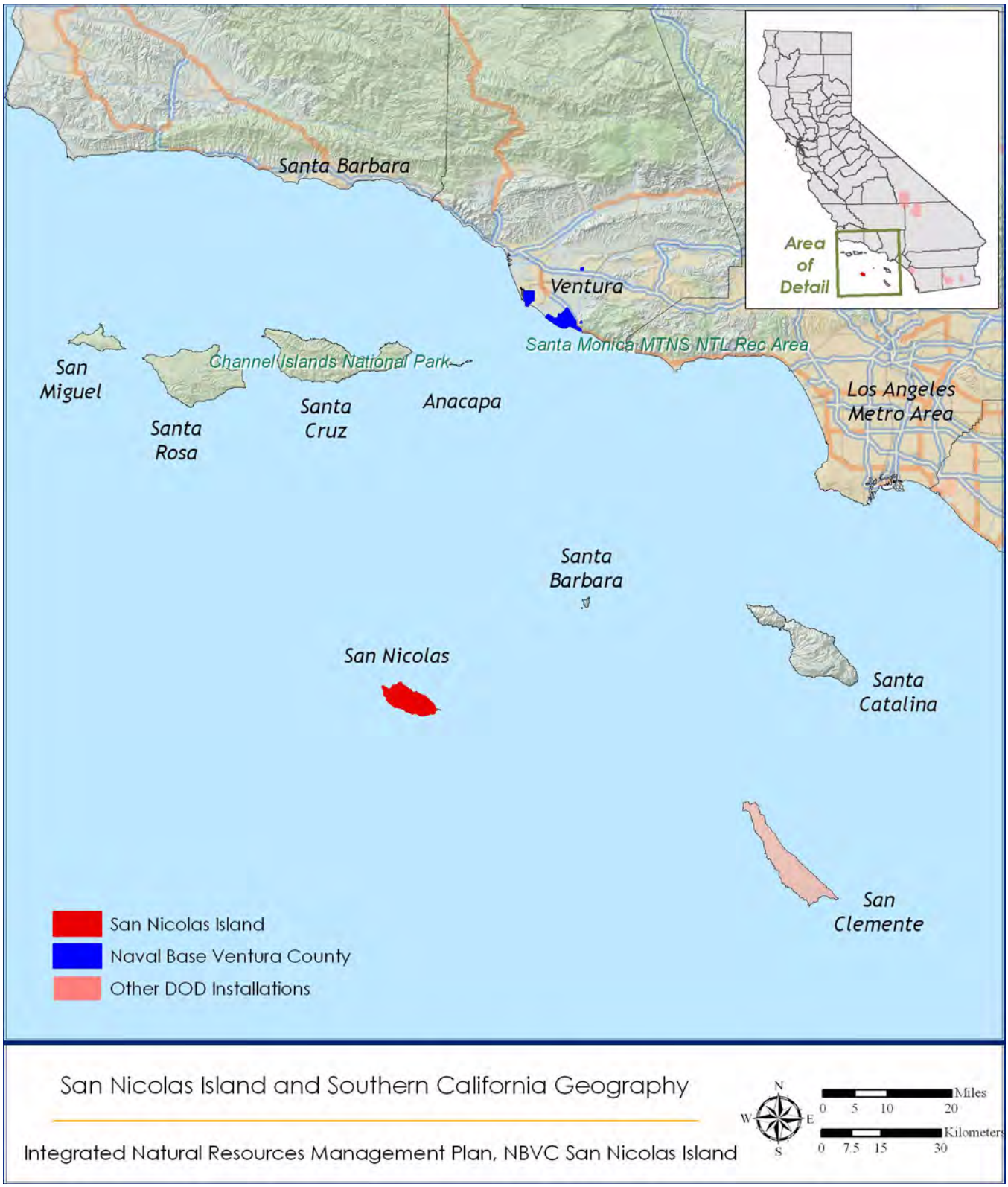
San Nicolas Island is separated by deep ocean channels from the other Channel Islands in the chain. The island is oriented west-northwest to east-southeast, is oval-shaped, and is about nine miles (14 km) long and 3.6 miles (5.8 km) wide (Map 1-1). San Nicolas Island presents a low, table-like profile with topography dominated by a broad terrace or mesa with no distinctive peaks. The Navy owns the island to the mean high water mark (MHW), an area that encompasses approximately 14,258 acres (5,772 hectares [ha]) and the highest elevation on SNI is 908 feet (277 meters [m]) at Jackson Peak. In general, the island exhibits sparse vegetation and subsequent erosion. This poor vegetation cover is mostly attributable to past sheep ranching, the island's arid climate, and high winds.

This INRMP will be used to manage all of SNI lands, and adjacent waters of the nearshore environment with which the Navy interfaces. The previous (2005) INRMP did not specifically address intertidal or the nearshore environment beyond MHW. This INRMP will address the expanded footprint, including all waters surrounding the island within the 300-foot (91-m) isobath or 1.0 nautical mile (nm) distance from shore, whichever is greater (see Map 1-1).

Marine species considered in this INRMP include those closely associated with SNI and regularly occurring within the expanded footprint. This includes seasonally occurring marine mammals that haul out or breed on SNI as well as the permanent southern sea otter population. Oceanic species, such as large cetaceans or highly migratory fishes, which may occasionally occur within the expanded footprint, though on a transient or infrequent basis, are not included. Offshore and oceanic species are addressed on an as-needed basis in species specific consultations and permit processes for Navy activities offshore SNI.

1.4 Real Estate Summary

In 1933, the island was transferred to the U.S. Navy by an EO of President Hoover. In November 1942, the U.S. Army was given temporary jurisdiction over the island and intended to base an air observation squadron, however, the U.S. Army never stationed such a squadron there (S. Schwartz, *personal communication* [*pers. comm.*], 2010). San Nicolas Island was returned to the U.S. Navy following the end of World War II and in 1947, the island came under the control of the Naval Air Station (NAS) at Point Mugu as part of the Naval Air Missile Test Center (De Violini 1974).



Map 1-1. Regional location of Naval Base Ventura County and San Nicolas Island.

The Naval facilities at SNI support the mission of the Naval Air Warfare Center Weapons Division (NAWCWD) Point Mugu Sea Range (PMSR), which controls 36,000 square miles (mi^2) (93,240 square kilometers [km^2]) of Special Use Airspace over the Pacific Ocean. The PMSR parallels the California coastline for about 200 miles (322 km) and extends seaward for more than 180 nm (333 km).

1.5 Achieving Success and No Net Loss to the Military Mission

Operations at SNI occur in the Sea Range and support Research Development Assessment Test and Evaluation (RDAT&E) for air warfare systems. There are five general categories of tests to evaluate sea, land, and air weapons systems conducted on the Sea Range: (1) air-to-air tests; (2) air-to-surface tests; (3) surface-to-air tests; (4) surface-to-surface tests; and (5) subsurface-to-surface tests. The Sea Range also supports four categories of training: (1) fleet exercise training; (2) littoral warfare training; (3) small-scale amphibious warfare training; and (4) aircraft training operations. These RDAT&E and training activities occur in waters surrounding SNI and instrumentation on the island is used to record and evaluate RDAT&E operations.

- **For more information on the military use of land and water at SNI refer to *Section 2: Military Use and Natural Resources Management.***

The military mission, derived from Title 10 of the USC, requires the Navy to "maintain, train and equip combat-ready naval forces capable of winning wars, deterring aggression and maintaining freedom of the seas." In keeping with the principal use of military installations to ensure the preparedness of the U.S. Armed Forces, SAIA mandates that the INRMP shall provide for no net loss of the capability of the installation's lands to support the military mission.

There are several important points regarding the military mission and natural resources at SNI:

- Navy use of land is not particularly intensive, since in general the island is used as a staging area for RDAT&E operations.
- Existing test sites are routinely re-used, which takes advantage of existing infrastructure and avoids additional resource conflicts and costs associated with establishing new areas.
- Large areas remain undisturbed for the specific purpose of natural resource protection, safety and security buffer zones.
- Most high value resource areas are in locations not intensively used for ground-related military activities.
- The island is still recovering from resource damage that occurred when livestock grazing was intense.

1.5.1 Mission Sustainability and the INRMP "No Net Loss" Requirement

The common principal between national security and public land stewardship is the concept of sustainability. Sustainability is a relative condition of the ecosystem and the military mission that can be measured; however, measures of sustainability are scale-dependent. The most widely used definition of sustainability and sustainable development was developed by the World Commission on Environment and Development (also known as the Brundtland Commission [1987]): "[Sustainable resource management is]...the capacity to meet the needs of the present without compromising the ability of future generations to meet their own needs." Given the strategic significance of SNI and the Navy's investment in its ranges, the sustainability and "no net loss" of the resources that support it are considered further in *Section 5: Sustainability and Compatible Use at San Nicolas Island.*

Sustainability may be considered as having at least several measurable components in the context of this INRMP – military use facilitation, soil and water resource protection, ecological integrity, cultural resource protection, and range safety for current and future use. For the purpose of this INRMP, an impact to mission accomplishment has occurred when any of the above are constrained or when one of the following conditions occurs:

- Quality of military training is impacted by natural resource restrictions.
- Training qualification objectives to deploy are not accomplished without significant delay or conflict.
- Environmental issues hamper scheduled operations.
- Conflict resolution impacts training intensity or tempo and the target resource condition is impacted.
- Soil and water resources are impaired such that compliance has become a problem and the irretrievable damage has occurred. Protection of soil and water resources will protect the capacity of the ecosystem to recover from disturbance, and sustain its natural carrying capacity to support plants and animals and provide a realistic training environment. Soil surface stabilization is needed to minimize erosion, and maximize opportunities for soils to self-stabilize after disturbance. Water supply, natural hydrologic processes, and water quality are essential to most ecological functions including recoverability from disturbance. Managing for sustainability means preventing damage that will eliminate an area from use for the foreseeable future, or for which restoration or mitigation is excessively costly. The threshold beyond which an area loses its capability to sustain its original training load is loosely termed the carrying capacity.
- Ecological integrity is irretrievably harmed. Compliance under the SAIA for mission sustainability ("no net loss") is also defined in this Plan to include the ecological integrity of training lands, since this integrity will carry these lands into the long-term future with all the elements that allow self-recovery to remain intact. Keeping all the pieces (habitats and species) that allow the ecosystem to function at various scales and at the highest level possible, given the mandate for land and water use, is the third component to protecting sustainability.
- Cultural resources compliance is impaired. Long-term strategies include cultural resources surveys of areas that are not targeted for immediate use. Some of these areas may be opened to training in the future. Under Section 110 of the National Historic Preservation Act (NHPA), federal land managers are directed to inventory cultural resources on lands under their control even when no activity or undertaking is planned. This inventory is usually accomplished through sample surveys designed to characterize the resource base and make projections. Such investigations aid in long-term planning and contribute to the archaeological context that is developed to evaluate resources.
- Range Safety for Current and Future Use. Ability to keep the range clean of hazardous material and unexploded ordnance aids in assuring the safety of the range not just for current training purposes but also potentially for an alternate future use.

San Nicolas Island is situated in a remote offshore location with no public or private in holdings or fee use areas, which allows for unencumbered land uses to sustainably accomplish its military mission while conserving environmental resources.

The strategic importance of SNI and NAWCWD PMSR is characterized by its ability to provide a safe, highly instrumented volume of air and sea space in which to conduct controlled tests and operational training while maintaining environmental resources. The PMSR is used by U.S. and allied military services to test and evaluate weapon systems associated with air warfare, missiles and missile subsystems, aircraft weapons integration, and airborne electronic warfare systems. A unique combination of attributes make it a strategically important range complex for the Navy by providing realistic training opportunities to maintain operational readiness and to test and evaluate processes critical to the successful assessment, safe operation, and improvement of the capabilities of current and future weapon systems. Because of its strategic geographic location and proximity to other military installations, SNI can be used to mimic shipboard launches of missiles and targets. Island facilities support all aspects of range operations, such as missile and target launches.

Under the SAIA, SNI must ensure mission sustainability and see that there is no net loss to the military mission due to implementation of this INRMP. To do this, the link between land use and the mission of supporting testing, training, research and development operations at NAWCWD PMSR must be maintained by identifying and partitioning the requirement of resource protection and the military missions of the landowner and its tenant users.

1.5.2 Facilities

The existing facilities throughout the installation range in age from 1942 to recent construction (Naval Facilities Engineering Command Southwest [NAVFAC SW] 2010a). San Nicolas Island has a 10,000-foot (3,048-m) concrete and asphalt runway located on the mesa in the eastern portion of the island. A control tower, hangers, ground control approach capabilities, and a fire station are adjacent to the airfield. See *Section 2.1.3: Facilities* for SNI's range instrumentation facilities, airfield operations facilities, and waterfront operations facilities.

■ **Refer to *Section 2.1.3: Facilities* for more information on facilities on SNI.**

There are 85 buildings and 71 structures on SNI with facilities to transport, house, and support personnel and related materials. Infrastructure includes water wells, a desalination plant, water distribution and sewage systems, and a power plant and distribution system. The island has 47 miles (76 km) of roads, 22 miles (35 km) of which are paved. The barge landing ramp at the southeast of the island at Dayton Beach is an Open Ocean Roll-on, Roll-off Barge Landing Ramp (NAVFACSW 2010a). The ramp is important for the operations and support of the Island because most items transported to the Island are too heavy for air transport and are therefore shipped via barge. Map 1-2 shows existing facilities on SNI.

■ **See *Section 2.1.4: Transportation and Utilities* for more information concerning transportation, the electrical distribution system, water distribution system, storm drainage system, sanitary sewer system, and communications system.**

1.5.3 Military Land Use and Categories of Operations

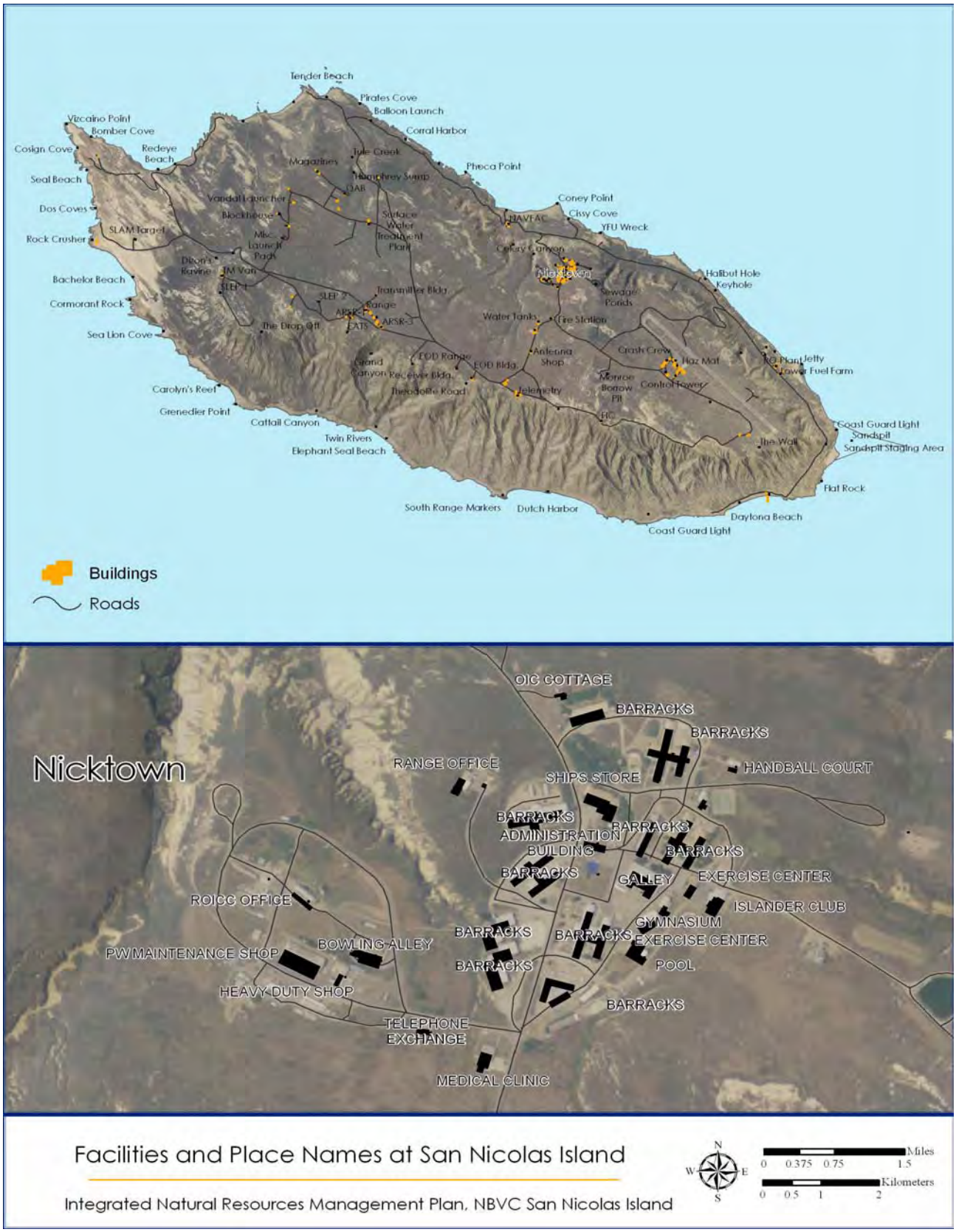
San Nicolas Island's primary mission is to support the RDAT&E of Air Weapons and associated aircraft systems into strike, anti-surface, and anti-air warfare aircraft within the NAWCWD PMSR (NAVFACSW 2010a). In support of this mission, SNI serves two primary functions: as a launch platform for short and medium missile testing, and as an observation facility for missile testing (NOLF SNI 2003).

Most of SNI is used as a range instrumentation site to support Sea Range operations. Instrumentation facilities are identified in *Section 2.1.2.1: Sea Range Weapons System Tests*. There are five general categories of tests to evaluate sea, land, and air weapons systems conducted on the Sea Range: (1) air-to-air tests; (2) air-to-surface tests; (3) surface-to-air tests; (4) surface-to-surface tests; and (5) subsurface-to-surface tests (NAWCWD 2002). The Sea Range also supports four categories of training: (1) fleet exercise training; (2) littoral warfare training; (3) small-scale amphibious warfare training; and (4) aircraft training operations (NAWCWD 2002). These activities occur in waters surrounding SNI and instrumentation on the Island is used to record and evaluate operations.

All development on SNI is associated with the military use of the Sea Range, and land uses have most recently been categorized and assessed in the NBVC SNI and Fort Hunter Liggett Activity Overview Plan (NAVFACSW 2010a). According to the Activity Overview Plan land uses have been categorized by their mission criticality as Mission Critical, Mission Support, or Quality of Life. In addition to these land use categories this INRMP will also assess open space at SNI as a land use to support the natural resource conservation and stewardship program.

Mission critical lands and facilities are those which directly support the mission of the installation and tenants. Mission critical functions aboard SNI include Airfield Operations and RDAT&E Operations.

Mission support lands and facilities are those which indirectly support the mission of the installation and tenants. Mission support functions aboard SNI include Administration, Communications (non RDAT&E), Circulation, General Maintenance, Public Safety, Supply, Utilities, Vehicle Maintenance, and Weapons.



Map 1-2. San Nicolas Island facilities map.

Quality of life lands and facilities are those which support the well-being of the warfighter. Quality of life lands and facilities include Bachelor Housing, Community Support, Medical/Dental, and Recreation. The Community Support area on SNI is also informally known as "Nicktown."

Regional U.S. Navy Military Land Use

Southern California is home to the nation's largest concentration of Naval forces. One-third of the U.S. Pacific Fleet makes its homeport in San Diego. The Southern California (SOCAL) Range Complex is an adjacent ocean training range just to the south of the NAWCWD PMSR and services a unique national military training capability in the southwestern U.S., centered around the Naval Auxiliary Landing Field (NALF) San Clemente Island (SCI). Considering the large expanse of the NAWCWD PMSR, other military bases benefit from electronic monitoring capabilities and availability of controlled air and sea space including Vandenberg Air Force Base, California and U.S. Naval Construction Battalion Center, Port Hueneme, California.

■ **For more information regarding operations, facilities, transportation and utilities refer to *Section 2: Military Use and Natural Resources Management*.**

The Naval Air Systems Command

The Naval Air Systems Command (NAVAIR) is a U.S. Navy command, headquartered in Patuxent River, Maryland, with military and civilian personnel stationed at eight principal continental U.S. sites and one site overseas. The NAVAIR provides unique engineering, development, testing, evaluation, in-service support, and program management capabilities to deliver airborne weapons systems that are technologically superior and readily available. Using a full-spectrum approach, the command delivers optimal capability and reliability for the Sailor and the Marine. The NAVAIR is the principal provider for the Naval Aviation Enterprise (NAE), but contributes to every Warfare enterprise in the interest of national security.

The Naval Air Warfare Center, Weapons Division

The NAWCWD is an organization within NAVAIR, dedicated to maintaining a center of excellence in weapons development for the USDON. The NAWCWD has two locations in southern California; China Lake hosting the land test range and Point Mugu hosting the sea test range.

Naval Base Ventura County

Naval Base Ventura County is a major aviation shore command and a Naval Construction Force mobilization base providing airfield, seaport and base support services to fleet operating forces and shore activities. Naval Base Ventura County hosts NAWCWD at Point Mugu and provides the land, facilities, and other services to support the military mission throughout the PMSR. The PMSR encompasses facilities at NAS Point Mugu, Laguna Peak, SNI, and portions of the northern Channel Islands.

Several of the northern Channel Islands are either owned by the Navy or provide Navy instrumentation sites that are critical to Sea Range operations. These islands are SNI, San Miguel Island and associated Prince Island, Santa Cruz Island, and Santa Rosa Island. San Miguel, Santa Cruz, Santa Rosa, Santa Barbara, and Anacapa Islands also form the Channel Islands National Park (CINP).

San Nicolas Island, one of the Channel Islands owned by the U.S. Navy, is an integral part of the NAVAIR sea range. The NAVAIR Range Department holds responsibility for developmental and operational activity associated with SNI. Thus, NBVC is the land owner/manager of SNI (Figure 1-1). The Commanding Officer (CO), NBVC is responsible for implementing policies and instructions of USDON, in accordance with OPNAVINST 5090.1C.

The U.S. Navy also owns San Miguel Island and associated Prince Island. The National Park Service (NPS) manages San Miguel Island and Prince Island as part of the CINP under a memorandum of understanding (CINP 2010). There are no facilities on San Miguel Island except for an unmanned, remotely interrogated solar powered automatic weather station (NAWCWD 2002).

The majority of Santa Cruz Island is owned by The Nature Conservancy and NPS. However, the U.S. Navy has a 10 acre lease from The Nature Conservancy on Santa Cruz Island at a radar site that serves as an instrumentation facility for the Sea Range (NAWCWD 2002). Use and management of the bunkhouse facility and utility systems at the radar site on Santa Cruz Island are accomplished through an interagency agreement between the U.S. Navy and NPS (CINP 2010).

Santa Rosa Island is owned by NPS. There are no Navy facilities on Santa Rosa Island except for a tracking antenna (NAWCWD 2002).

1.6 Key Issues and Concerns

A "key issue" is a focus of effort for the SNI INRMP Working Group (WG) because it is important, not easily solved, and it may have more than one solution in which trade-offs need to be evaluated. The WG identified the following key issues to be addressed using the planning process and framework as described in this Section; they are listed in no particular order:

- The tone and tempo of the military use of the island changes over time, which results in a need for natural resource managers to adapt to new military uses.
- Erosion and sedimentation continue, arising from inadequately constructed or maintained roads, or from ongoing damage instigated by past overgrazing. Wind erosion is of special concern and ground disturbance should be carefully evaluated and controlled.
- There has been a massive historic change in vegetation composition and loss of overall cover, resulting in difficulty in defining desired future conditions for native habitats.
- Invasive exotic species are an ongoing threat that affects the ability of sensitive or endemic species to be self-sustaining. The habitat values for endemic species far exceed the monetary values used to control the invasive exotic species that affect them.
- Wildland fire patterns with increasing fuel loads may affect the ability of sensitive species to be self-sustaining.
- Expanding marine mammal populations require increased attention in order to minimize operational conflicts, loss of habitat for other listed or sensitive species, and maintain compliance with regulatory requirements.
- Avian species inhabit a variety of habitats and locations and their success and persistence requires additional procedures and planning in order to reduce potential conflicts that may arise from military use, airfield operations, or from renewable energy efforts such as the development of wind turbines.
- Regional planning efforts in support of the California Marine Life Protection Act (MLPA) suggest a need to integrate Marine Protected Areas (MPAs) into the management strategy of coastal resources and use.

1.7 INRMP Vision, Goals and Objectives

The Vision for this INRMP is to institutionalize a Navy conservation ethic and fully comply with regulatory requirements by maintaining the continued ability of the Navy at SNI to support mission requirements while improving the conditions for long-term certainty and permanence through applying the principles of ecosystem management, adaptive management, and cooperative management in an integrated approach.

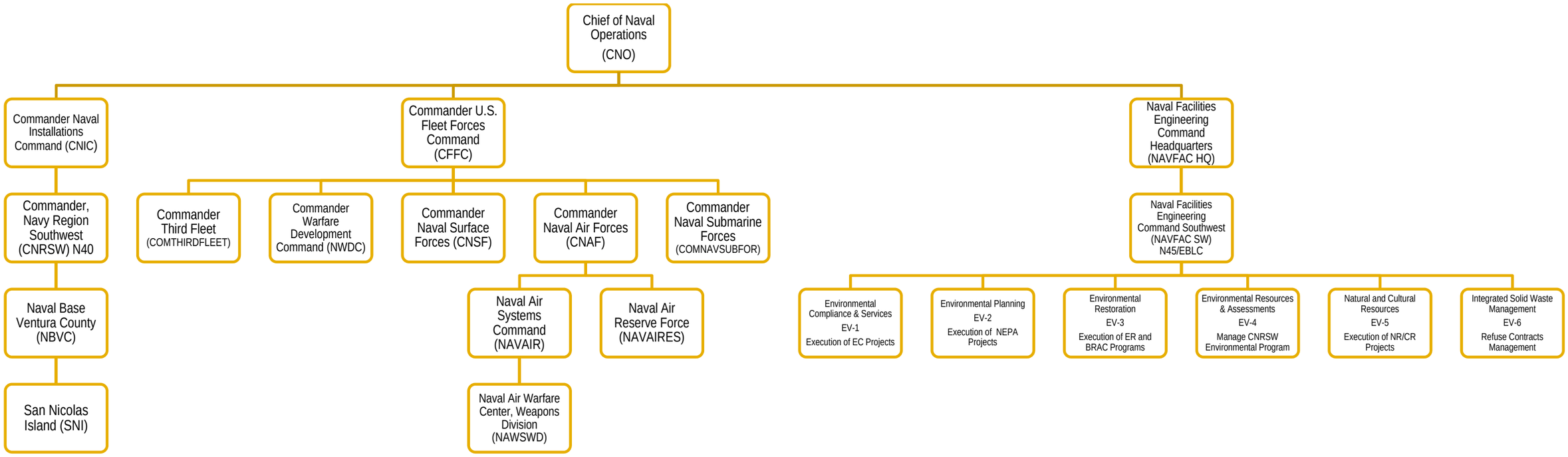


Figure 1-1. Organizational chart.

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Integrated Natural Resource Management Plans have goals that are shaped by USDOD guidelines and directives, pertinent laws and regulations, public needs, public values, ecological theory and practice, and management experience. The planning terms used in this document such as "goal," "objective," and "strategy" cover a gradient of specificity and durability, ranging from a very broad, enduring goal to specific strategies. Management strategies are developed and presented using a step-down approach, using the planning definitions in Table 1-1 (see *Section 4: Natural Resource Management Objectives and Strategies* and *Section 5: Sustainability and Compatible Use at San Nicolas Island* for examples).

Table 1-1. Planning definitions used in this Integrated Natural Resources Management Plan.

Hierarchy	Definition
Goal	Broad statement of intent, direction, and purpose. An enduring, visionary description of where you want to go, an end outcome. A goal is not necessarily completely attainable. It does, however, describe a desired outcome related to the mission, rather than an activity or a process.
Objective	Specific statement that describes a desired future end-state or successful outcome that supports an INRMP goal or Navy policy. Can be quantitative. Should be followed by a "standard," which is an observable indicator by which successful attainment of a condition stated in the objective is measured. "How do we know we are making progress or we have attained the desired end-state or successful outcome?" Should be good for at least five years.
Strategy	Explicit description of ways and means chosen to achieve objectives. "What are we going to do about it?"
Project/Task	Specific step, practice, or method to get the job done, usually organized sequentially with timelines and duty assignments. These go out of date quickly and should be updated annually.

The goals of the SNI INRMP are to:

- *Utilize adaptive management to maintain long term ecosystem health and minimize impacts to existing habitats consistent with the operational requirements of USDOD's training and testing mission.*
- *Facilitate sustainable military readiness and foreclose no options for future requirements of USDOD.*
- *Conserve the full suite of native species and restore ecological communities to self-sustaining levels.*
- *Achieve ecosystem resilience to mission impacts.*

The objectives and management strategies developed to support these goals are included in *Section 4: Natural Resource Management Objectives and Strategies* and *Section 5: Sustainability and Compatible Use at San Nicolas Island*. The objectives and management strategies addressed in Sections 4 and 5 were developed for each INRMP management topic through expert interviews conducted with installation managers. This collaborative and interactive process allowed specific concerns to be identified, current management practices to be documented, the sufficiency of those practices to address those specific concerns to be assessed, and the development of objectives and management strategies to guide future practices to reconcile those deficiencies in order to ensure that specific concerns are addressed. The purpose for including specific concerns, current management, assessment of current management, and management strategies is further discussed below.

Specific Concerns. The discussion of specific concerns identifies management concerns or issues specific to SNI. These specific concerns may describe any aspect of the status and trend of the resource that may be a concern to its health, abundance, or stability or address what controlling factors are involved. Other questions that specific concerns address include:

- Are there known threats to the health of the resource?
- Does the resource have any particular vulnerabilities (e.g. small breeding area in few locations)?

- Does the expansion of the resource create a problem for other resources or the military mission?
- Is there uncertainty about the status or trend of the resource such that environmental documentation (National Environmental Policy Act [NEPA], etc.), adaptive management, or ecosystem management is impaired (i.e. is there sufficient inventory and monitoring)?

Current Management. The discussion of current management states how the resource is managed now: Biological Opinions (BOs), Record of Decisions (RODs), permits, zoning, mitigation commitments, policies, NEPA site approval process, and inventory or survey reports. According to the USDOD Template for INRMPs (USDOD 2006), a discussion of current management should:

"include a detailed discussion, specific to the installation, of the type of management used to carry out the natural resources program. Examples include ecosystem management, adaptive management, cooperative management, and combinations of these and other management approaches."

The purpose of the current management discussion is to describe the tools and plans used for natural resource management at SNI for each specific INRMP topic.

Assessment of Current Management. The discussion of the assessment of current management at SNI relates the specific concerns to management adequacy for each INRMP topic. This discussion states the installation's findings with respect to data gaps, any military mission conflicts, ability to support avoidance and minimization of impacts, or the sustainability of natural resource uses. This discussion also considers the relationship between risks, vulnerabilities, uncertainties, costs, and benefits to develop objectives and management strategies that support adaptive management.

Management Strategy. These previous discussions lead to the identification of an objective and management strategy for each INRMP topic. For the purposes of this INRMP, an objective, describes the desired outcome in terms of the structure and function of what is being protected. The definition of an objective from Navy guidance and from the INRMP scopes of work is as follows:

> *"the contractor shall work with the installation and other stakeholders to develop objectives for resource management that translates the vision into a strategy. Objectives should be specific, measurable, achievable, and realistic in time frame and budget. They should also have a fixed end point. Objectives and strategies should be based on the principles of adaptive management, whereby management actions are treated as scientific hypotheses to be tested."*

- **For more information on the ecosystem based management approach used in this INRMP refer to *Section 1.10: Ecosystem Approach* and *Section 4.1: Ecosystem Approach*.**

Each INRMP topic in Sections 4 and 5 are addressed, at a minimum, with an objective and a management strategy. These management strategies are the basis for developing projects that are identified in *Section 6.5: INRMP Implementation Summary and Schedule*. A summary of each project developed to support each management strategy in included in Table 6-1. All management strategies developed in this INRMP support projects that pertain to each respective INRMP topic. A management project may be supported by a single management strategy or may be supported by multiple strategies that are categorized in various INRMP topics. For example, a project related to terrestrial invasive exotic species control may be supported by management strategies discussed in terrestrial vegetation communities as well as in the terrestrial invasive exotic species section. Thus, all the projects included in this INRMP will support an ecosystem based management approach if fully implemented, funded, and enforced.

1.8 Roles and Responsibilities for the INRMP

1.8.1 INRMP Working Group

A WG consisting of both internal Navy and external stakeholders was formed to develop this INRMP. They met with this mission:

The SNI INRMP WG will develop an implementable plan to maintain long-term ecosystem health and minimize adverse impacts to existing habitats consistent with the operational requirements of USDOD's training and testing mission.

The WG met regularly to assess SNI's ecological needs, develop objectives, and review the conservation strategies proposed. Based on Navy guidance the expectations of the WG are:

- Assess ecological needs.
- Develop a mission statement: A mission statement defining the philosophy, core values, mandates, and natural resources management goals on SCI will be developed by the WG. The statement will be included in the INRMP and will provide a clear concept of where the installation is going, as well as help define the INRMP objectives.
- Develop conservation priorities: The WG and other stakeholders will set conservation priorities by focusing on sensitive species, their habitats, and threats to their existence. Once these are identified, a vision of the desired future of the resources within the context of the military mission will be developed.
- Develop objectives and strategies.
- The WG and other stakeholders will use the desired visionary outcome as mentioned above to formulate objectives and a resulting strategy for resources management. The objectives will be specific, measurable, achievable, and realistic for the time frame and available budget. They should have a fixed end point. They should be based on the principles of adaptive management, whereby management actions are treated as scientific hypotheses to be tested.
- Develop a project implementation table with prioritized ranking of projects and a timeline.

Figure 1-2 show the general WG process for INRMPs.

1.8.2 Installation Stakeholders

Personnel from NAVFAC SW have natural resources programming and technical support roles in developing this INRMP. Policy leadership and liaison with non-Navy partners is provided through Commander, Navy Region Southwest (CNRSW) N40. The Commander, Naval Installations Command (CNIC) reviews the implementation strategy in *Section 6: Implementation Strategy* of this INRMP. Both NBVC natural resources staff and natural resources business line team specialists (N45) provide technical support.

NAVAIR is the primary tenant on SNI and was represented at WG meetings. Other installation interests include those identified below:

Environmental Division. The Environmental Division (ED), as delegated by command directive, is responsible for the management of natural resources on the island as part of the NBVC overall environmental program. Acting through the Natural Resources Manager, ED is responsible for preparation and implementation of this INRMP. This is the direct "vehicle" for accomplishment of many of the above responsibilities of the CO.

Public Works Department. The NBVC Facilities Planning Office, Public Works Department (PWD), is responsible for the comprehensive oversight and planning of all land use issues relating to SNI.

Office of Counsel. The Office of Counsel provides legal services to NAWCWD on a variety of environmental matters. Particularly pertinent to natural resources management in review of NEPA documentation and legal interpretations involving compliance with natural resources laws as they pertain to Range operations.

Public Affairs Office. The Public Affairs Office is involved in aspects of the environmental program at SNI. This includes being informed of the public notice process required in various NEPA analysis processes.

Figure 1-2. Integrated Natural Resources Management Plan Working Group Process.

Pacific Ranges and Facilities Department. The Pacific Ranges and Facilities Department is responsible for accomplishment of much of the military mission at SNI. As such, the Pacific Ranges and Facilities Department and land and natural resource managers at SNI must coordinate to minimize conflicts between mission requirements and stewardship/compliance aspects of natural resources management and to effectively use natural resources management to support the military mission.

Naval Facilities Engineering Command Southwest. NAVFAC SW is responsible for providing support for natural resources management at SNI when requested. NAVFAC SW is currently providing funding and contractual oversight support for the preparation of this INRMP, the Alien Plant Management Plan, plant surveys, and non-native plant eradication efforts. Contractual support is also being provided for the island fox monitoring work.

1.8.3 External Stakeholders

Integrated Natural Resources Management Plans are to be developed in cooperation with and the concurrence of NOAA, USFWS-Ecological Services as well as the state fish and wildlife agency, in this case, the CDFG. The CDFG is responsible for management of most fish and wildlife within the state. Signatures on the document reflect mutual agreement. Additional informal or formal consultations will be required for project proposals that may affect listed species. Through a Tripartite Agreement, the USFWS, NOAA, and CDFG have a statutory obligation to review and coordinate on INRMPs. Recognizing this key, three-way partnership in preparing, reviewing, and implementing INRMPs among the USDOD, U.S. Department of Interior (USDOI), USFWS, and state fish and wildlife agencies, a Tripartite Agreement was signed in January 2006. The CDFG and other state fish and wildlife agencies were represented by the International Association of Fish and Wildlife Agencies (IAFWA). The desire is for "synchronization of INRMPs with existing Fish and Wildlife Service and state natural resource management plans" and "mutually agreed-upon fish and wildlife service conservation objectives to satisfy the goals of the Sikes Act."

A Strategic Action Plan (03 February 2005) was also developed among the three partners for improving the quality and consistency of INRMPs, and ensure compliance with two amendments to USDOD responsibilities under the Migratory Bird Treaty Act (MBTA) and ESA. The MBTA as amended by the National Defense Authorization Act (NDAA; 2003 Authorization) for Fiscal Year (FY) 2003 exempted the USDOD from the MBTA for the incidental take of migratory birds as a result of otherwise authorized military readiness activities until the Secretary of Interior prescribes regulations authorizing such take. The USDOD shall give appropriate consideration to the protection of migratory birds when planning and executing military readiness activities. As indicated in the proposed rule, migratory bird conservation will be incorporated into INRMPs, where applicable, to mitigate where needed and to protect migratory birds and their habitats. The NDAA for FY 2004 changed the ESA regarding INRMPs, which were justified on the basis of the need to promote military readiness while protecting listed species. Under new Section 4(a)(3)(B)(i) of the ESA, the Secretary of the Interior or the Secretary of Commerce, as appropriate, is precluded from designating critical habitat on any areas owned, controlled, or designated for use by USDOD where an INRMP has been developed that, as determined by the Interior or Commerce Secretary, provides a benefit to the species for which critical habitat designation is proposed.

The external stakeholders participating in this INRMP include:

- USFWS–Ecological Services
- CDFG, Habitat Conservation, Marine and Terrestrial
- Bureau of Land Management (BLM) California Coastal National Monument (CCNM)
- NOAA
  - NMFS Habitat Conservation
  - Protected Resources
- NPS–CINP

1.9 Stewardship and Compliance Criteria for Implementing Projects

For the purposes of this INRMP, the terms stewardship and compliance have specific meanings as criteria for implementing project lists. Project rankings are assigned based on whether an activity is mandatory to comply with a legal requirement such as under the ESA, Clean Water Act (CWA), or MBTA. Alternatively, a project may be considered good land stewardship but is not considered an obligation for SNI to be found in compliance with environmental laws. Projects considered necessary to comply with the law are generally funded within budget constraints, whereas stewardship projects are ranked lower for funding consideration when projects are competed among multiple installations. Currently policy is, however, that they will eventually be funded.

The budget programming hierarchy for this INRMP is based on both USDOD and Navy funding level classifications. The USDOD programming and budgeting priorities for conservation programs are described first (see below). They come from USDODINST 4715.3 Environmental Conservation Program. Funds will be requested for tasks within the INRMP, with priority given to Class I, II, and III projects, in that order, based on this guidance. The USDODINST 4715.3 document defines four classes of conservation programs; compliance activities fall into the first three classes and stewardship activities fall into the fourth class. Accordingly, the projects recommended in this INRMP have been prioritized based on compliance and stewardship criteria. Four programming and budgeting priority levels are detailed, with the first three classified as “Compliance” and the fourth as “Stewardship.” Funding is routinely programmed three years in advance of project implementation.

Compliance

1. *USDOD Class 0: Recurring Natural and Cultural Resources Conservation Management Requirements.* These are activities needed to cover the recurring administrative, personnel, and other costs associated with managing USDOD’s conservation program that are necessary to meet compliance requirements (federal and state laws, regulations, EOs, and USDOD policies) or that are in direct support of the military mission. Also included are environmental management activities associated with the operation of facilities, installations, and deployed weapons systems.
2. *USDOD Class I: Current Compliance.* These projects and activities are needed because an installation is currently out of compliance (has received an enforcement action from a duly authorized federal or state agency, or local authority); has a signed compliance agreement or has received a consent order; has not met requirements based on applicable federal or state laws, regulations, standards, Presidential EOs, or USDOD policies; and/or are immediate and essential to maintain operational integrity or sustain readiness of the military mission. This also includes projects and activities needed that are not currently out of compliance (deadlines or requirements have been established by applicable laws, regulations, standards, EOs, or USDOD policies, but deadlines have not passed or requirements are not in force) but shall be if projects or activities are not implemented in the current program year.
3. *USDOD Class II: Maintenance Requirements.* These are projects and activities needed that are not currently out of compliance (deadlines or requirements have been established by applicable laws, regulations and standards, EOs, or USDOD policies, but deadlines have not passed or requirements are not in force), but shall be out of compliance if projects or activities are not implemented in time to meet an established deadline beyond the current program year.

Stewardship

4. *USDOD Class III: Enhancement Actions, Beyond Compliance.* These are projects and activities that enhance conservation resources or the integrity of the installation mission, or are needed to address overall environmental goals and objectives, but are not specifically required under regulation or EO and are not of an immediate nature.

Navy policy requires funding of all USDOD Class 0 and Class I projects. The Navy funding programming hierarchy of recurring and non-recurring projects consists of four Environmental Readiness Levels (ERLs) (USDON INRMP Guidance for Navy Installations, April 2006):

Environmental Readiness Level 4:

- Supports all actions specifically required by law, regulation or EO (USDOD Class 0, I, and II requirements) just in time.
- Supports all USDOD Class 0 requirements as they relate to a specific statute such as hazardous waste disposal, permits, fees, monitoring, sampling and analysis, reporting and record keeping.
- Supports recurring administrative, personnel and other costs associated with managing environmental programs that are necessary to meet applicable compliance requirements (USDOD Class 0).
- Supports USDOD policy requirement to comply with overseas Final Governing Standards and Overseas Environmental Baseline Guidance Document.
- Supports minimum feasible Navy executive agent responsibilities, participation in Office of Secretary of Defense (OSD) sponsored inter-department and inter-agency efforts, and OSD mandated regional coordination efforts.

Environmental Readiness Level 3:

- Supports all capabilities provided by ERL 4.
- Supports existing level of Navy executive agent responsibilities, participation in OSD sponsored inter-department and inter-agency efforts, and OSD mandated regional coordination efforts.
- Supports proactive involvement in the legislative and regulatory process to identity and mitigate requirements that will impose excessive costs or restrictions on operations and training.
- Supports proactive initiatives critical to the protection of Navy operational readiness.

Environmental Readiness Level 2:

- Supports all capabilities provided under ERL 3.
- Supports enhanced proactive initiatives critical to the protection of Navy operational readiness.
- Supports all Navy and USDOD policy requirements.
- Supports investments in pollution reduction, compliance enhancement, energy conservation and cost reduction.

Environmental Readiness Level 1:

- Supports all capabilities provided under ERL 2.
- Supports proactive actions required to ensure compliance with pending/strong anticipated laws and regulations in a timely manner and/or to prevent adverse impact to Navy mission.
- Supports investments that demonstrate Navy environmental leadership and proactive environmental stewardship.

1.10 Ecosystem Approach

The USDOD and the Navy have adopted a policy of ecosystem management for INRMPs. The USDOD (USDODINST 4715.3, Environmental Conservation Program) describes ecosystem management as, “a process that considers the environment as a complex system functioning as a whole, not a collection of parts, and recognizes that people and their social and economic needs are a part of the whole.” The USDOD goal with regard to ecosystem management is, “To ensure that military lands support

present and future training and testing requirements while preserving, improving, and enhancing ecosystem integrity. Over the long term, that approach shall maintain and improve the sustainability and biological diversity of terrestrial and aquatic (including marine) ecosystems while supporting sustainable economies, human use, and the environment required for realistic military training operations."

Department of Defense and Navy Instructions mandate an ecosystem framework and approach for the INRMP (USDODINST 4715.3 and OPNAVINST 5090.1C, Environmental and Natural Resources Program Manual, 30 October 2007). Ecosystem management in USDOD draws on a long-term vision of integrating ecological, economic and social factors. This approach shall take a long-term view of human activities, including military uses, and biological resources as part of the same environment. The goal is to preserve and enhance ecosystem integrity, and to sustain both biological diversity and continued availability of those resources for military readiness and sustainability and other human uses (as defined in OPNAVINST 5090.1C). Managing for sustainability and ecosystem management are both approaches that attempt to integrate long-term goals with short-term project lists.

The ecosystem mandate is accomplished by applying principles of sustainable use at several scales–emphases on partnerships, public outreach, long-term monitoring, and adaptive management. Consistent with Navy policy, ecosystem-based management shall include (OPNAVINST 5090.1C):

- A shift from single species to multiple species conservation.
- Formation of partnerships necessary to consider and manage ecosystems that cross boundaries.
- Use of the best available scientific information and adaptive management techniques.

An Adaptive Management approach is also a separate requirement for INRMPs under (USDODDIR 4715.DD-R 1996), when it states: "Incorporate a dynamic, continuous process for decision-making, including future changes or additions to the INRMP."

Executive Order 13423 "Strengthening Federal Environmental, Energy, and Transportation Management" (24 January 2007) required each USDOD component to adopt an Environmental Management System.

Adaptive management is partly implemented through the Navy's Environmental Management System (EMS) to integrate environmental considerations into day-to-day activities across all levels and functions of Navy enterprise. Executive Order 13423 "Strengthening Federal Environmental, Energy, and Transportation Management" (24 January 2007) required each USDOD component to adopt an EMS. An EMS is a formal management framework that provides a systematic way to review and improve operations, create awareness, and improve environmental performance. Systematic environmental management as an integral part of day-to-day decision making and long-term planning processes is an important step in supporting mission readiness and effective use of resources. The most significant resource for every organization is their senior leadership's commitment and visibility in EMS implementation and sustainability. A robust EMS is essential to sustaining compliance, reducing pollution and minimizing risk to mission. The Navy's EMS has a concerted focus on preventing pollution, consistent regulatory compliance, and reducing environmental impacts, including environmental practice for energy and transportation functions, using "plan-do-check-act" management model (OPNAVINST 5090.1C 30 October 2007). It conforms to the International Organization for Standardization (ISO) 14001:2004 EMS standard.

Adaptive management is also part of the INRMP annual review and revision process as described below and in Figure 1-3.

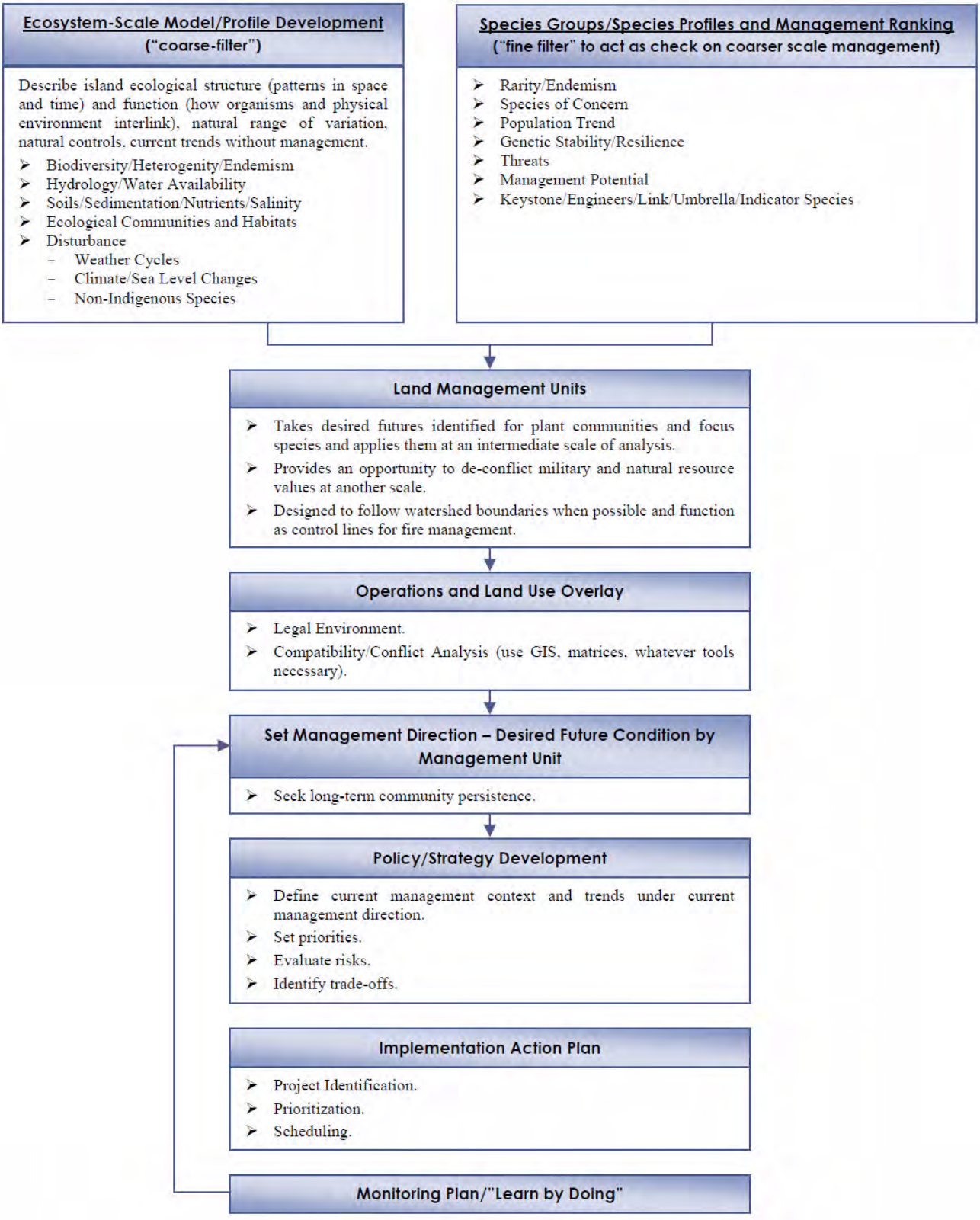


Figure 1-3. Ecosystem management-based decision process.

1.11 Revision and Annual Review

U.S. Department of Defense policy requires installations to review INRMPs annually in cooperation with the two primary parties to the INRMP (USFWS and the state fish and wildlife agency). Annual reviews facilitate "adaptive management" by providing an opportunity for the parties to review the goals and objectives of the INRMP, as well as establish a realistic schedule for undertaking proposed actions. In order to facilitate an annual review, this INRMP has been developed so that historic data is located in the text of the substantive sections of this document while appendices for special status species allow for insertion of annual monitoring data.

Section 101(b)(2) of the SAIA [16 USC 670a(b)(2)] specifically directs that INRMPs be reviewed "as to operation and effect" by the primary parties "on a regular basis, but not less often than every five years", emphasizing that the review is intended to determine whether existing INRMPs are being implemented to meet the requirements of the SAIA and contribute to the conservation and rehabilitation of natural resources on military installations. The OUSD Memorandum for Implementation of Sikes Act Improvement Amendments (17 May 2005) guidance states that joint review should be reflected in a Memorandum or letters.

Recent guidance on INRMP implementation interpreted that the five-year review would not necessarily constitute a "revision", that this would occur only if deemed necessary. The Annual Review process is broadly guided by the NAVFAC Environmental Conservation Program Directive (USDODDIR 4715.3, 03 May 1996) and by OPNAVINST 5090.1C, Environmental and Natural Resources Program Manual. The following policy memoranda clarified procedures for INRMP reviews and revisions:

- Deputy Under Secretary of Defense for Installations and the Environment (DUSD [I&E]) Memorandum,10 October 2002, which replaced a 1998 policy memorandum.
- Assistant Deputy Undersecretary of Defense (ADUSD) for Environment, Safety and Occupational Health (ESOH) Policy (01 November 2004 Memorandum).

The DUSD (I&E) Memorandum (10 October 2002) improved coordination external to USDOD (USFWS, state agencies, and the public) and internal to USDOD (military operators and trainers, cultural resources managers, pest managers). It also added new tracking procedures, called metrics, to ensure proper INRMP coordination occurred and that projects were implemented.

The Supplemental USDOD INRMP Guidance (01 November 2004 Memorandum) further defined the scope of the annual and five-year review, public comment on INRMP reviews, and ESA consultation. A formal review must be performed by "the parties" at least every five years. Informal annual reviews are mandatory to facilitate adaptive management, during which INRMP goals, objectives, and "must fund" projects are reviewed, and a realistic schedule established to undertake proposed actions. The outcome of this joint review should be documented in a memorandum or letter summarizing the rationale for the conclusions the parties have reached. This written documentation should be jointly executed or in some other way reflect the parties' mutual agreement.

According to *Public Comment on INRMP Reviews Legislative Language Section 2905 of the Sikes Act Improvement Act of 1997* [16 USC 670a note] the Secretary of each Military Department is required to provide the public an opportunity for the submission of comments on the initial INRMPs prepared pursuant to new Section 101(a)(2) of the SAIA [16 USC 670a(a)(2)]. An INRMP is a public document that requires the mutual agreement of the installation (e.g. NBVC), federal natural resource agencies (e.g USFWS and NOAA), and state fish and wildlife agencies (e.g. CDFG); therefore, it is crucial that a common understanding be reached regarding which projects contained in a draft INRMP are most likely to be funded under existing policy. The installation shall provide the public with a meaningful opportunity to review and comment upon the initial draft INRMP and initial draft INRMP revision (other than minor technical amendments). Concerning the length of public review, barring extraordinary circumstances, the public should be afforded a minimum of 30 days to review and comment (CNO Guidance April 2006).

There is no legal obligation to invite the public either to review or to comment upon the parties' mutually agreed upon decision to continue implementation of an existing INRMP without revision (DUSD [I&E] Memorandum, 10 October 2002). If the parties determine that substantial revisions to an INRMP are necessary, public comment shall be invited in conjunction with any required NEPA analysis.

1.12 Integrating Other Plans

The INRMP provides guidance and direction for natural resources management activities and provides a framework for plan implementation. It incorporates other planning documents from a variety of sources, as listed in Table 1-2.

Considering the U.S. Navy's sole ownership of SNI and its relative isolation from adjacent land masses the majority of regional use near SNI relates to the marine environment. Within the SCB, and in particular the Channel Islands area, significant regional uses include recreational activities, MPAs, ecological conservation, shipping channels, commercial fishing, and oil drilling. Jurisdiction and regulation of nearshore waters is dependent upon both the individual resources and their geographical location. The CDFG regulates commercial and recreational fishing in conjunction with the NMFS in certain instances; EFH, ground fishing (quotas), and other highly migratory fish species. Adjacent Channel Islands managed by the NPS and surrounding waters by the National Marine Sanctuaries Program or other conservation organizations focus on preserving and protecting natural and cultural resources that are unique to the region. Resource stewardship and integrated management practices currently implemented by the U.S. Navy at SNI are complementary to SCB regional marine and land use owners and regulators allowing for the development of beneficial partnerships in resource management.

The need for the INRMP to be consistent with different planning processes, such as the USFWS recovery plans, state wildlife action plan, NPS's plan, is not mandatory; but, the INRMP must state whether it is consistent with these plans. However, if the development of this INRMP is used to preclude the designation of Critical Habitat for federally threatened and endangered species from the USFWS, an explanation is required as to how SNI is participating in the recovery of the species.

Certain related or neighboring planning processes may affect this INRMP, and the WG will assess this Plan's consistency with the plans described below.

Point Mugu Sea Range Environmental Impact Statement/Overseas Environmental Impact Statement. The PMSR is composed of ocean areas, including surface and subsurface area and military airspace covering 27,278 nm^2 (93,561 km^2). The PMSR includes sophisticated range instrumentation centered on SNI, a Channel Island owned by the Navy. The PMSR also includes extended, over-ocean range areas that are utilized for specialized RDAT&E activities. These extended ocean areas cover approximately 221,000 nm^2 (758,000 km^2). The primary mission of PMSR is supporting naval RDAT&E activities. while the SOCAL Range Complex is primarily a training range. Notwithstanding, the SOCAL Range Complex supports limited numbers of RDAT&E activities, and PMSR supports training events. This Environmental Impact Statement (EIS)/ Overseas Environmental Impact Statement (OEIS) covers all Navy activities on the SOCAL Range Complex.

Southern California Range Complex Environmental Impact Statement/Overseas Environmental Impact Statement. The SOCAL Range Complex, with its ocean areas, airspace, and SCI's ranges, lies generally south of, and adjacent to, a separate and distinct PMSR. While the SOCAL Range Complex is primarily a training range it supports a limited number of RDAT&E activities. This EIS/OEIS covers all Navy activities on the SOCAL Range Complex.

Table 1-2. Various planning documents incorporated into this Integrated Natural Resources Management Plan.

Authoring Agency	Title	Date
U.S. Department of the Navy	*Naval Air Warfare Center Aircraft Division/ Weapons Division Strategic Plan*	2008
U.S. Department of the Navy	*Naval Air Warfare Center Weapons Division Point Mugu Sea Range Environmental Impact Statement/ Overseas Environmental Impact Statement*	2002
U.S. Department of the Navy	*United States Navy Pacific Fleet Southern California Range Complex Environmental Impact Statement/ Overseas Environmental Impact Statement*	2008
U.S. Department of the Navy	*Naval Base Coronado San Clemente Island Integrated Natural Resources Management Plan*	2002
U.S. Department of the Navy	*Naval Base Ventura County Integrated Cultural Resources Management Plan*	TBD
U.S. Department of the Navy	*Naval Base Ventura County Comprehensive Land Use Management Plan*	2005a
U.S. Department of the Navy	*Naval Base Ventura County Naval Outlying Landing Field San Nicolas Island Master Plan for Nicktown and Public Works Areas*	2003
U.S. Department of the Navy	*Naval Base Ventura County San Nicolas Island and Fort Hunter Liggett Activity Overview Plan*	2010a
U.S. Department of the Navy	*Naval Base Ventura County San Nicolas Island Integrated Natural Resources Management Plan*	2005b
U.S. Department of the Navy	*Naval Base Ventura County San Nicolas Island Bird/ Wildlife Aircraft Strike Hazard Plan*	TBD
U.S. Department of the Navy	*Naval Outlying Landing Field San Nicolas Island Emergency Response Action Plan*	2006a
U.S. Department of the Navy	*Naval Outlying Landing Field San Nicolas Island Oil and Hazardous Substance Integrated Contigency Plan*	2006b
U.S. Department of the Navy	*Naval Base Ventura County San Nicolas Island Storm Water Pollution Prevention Plan*	2010
National Renewable Energy Laboratory	*San Nicolas Island Renewable Community Plan Outline, Baseline Development, and Initial Renewable Assessment*	2008
U.S. Fish and Wildlife Service	*North American Waterfowl Management Plan*	2004
U.S. Fish and Wildlife Service	*North American Waterbird Management Plan*	2002
U.S. Fish and Wildlife Service	*United States Shorebird Conservation Plan*	2001
U.S. Fish and Wildlife Service	*Regional Seabird Conservation Plan Pacific Region*	2005
U.S. Fish and Wildlife Service	*Partners-in-Flight Landbird Conservation Plans*	
U.S. Fish and Wildlife Service	*California Channel Islands Species Recovery Plan*	1984
U.S. Fish and Wildlife Service	*Final Revised Recovery Plan for the Southern Sea Otter*	2003
U.S. Fish and Wildlife Service	*Recovery Plan for the Pacific Coast Population of the Western Snowy Plover*	2007
U.S. Fish and Wildlife Service	*Draft Post-Delisting Monitoring Plan for the Brown Pelican*	2009
National Park Service	*Channel Islands National Park General Management Plan*	1985
National Park Service	*Channel Islands National Park Recovery Strategy for Island Foxes on the Northern Channel Islands*	2003
National Atmospheric and Oceanic Administration	*Channel Islands National Marine Sanctuary Management Plan*	2009
Bureau of Land Management	*California Coastal National Monument Resource Management Plan*	2005
California Department of Fish and Game	*Marine Life Management Act Nearshore Fishery Management Plan*	2002
California Department of Fish and Game	*Marine Life Protection Act Master Plan for Marine Protected Areas*	2008a
California Department of Fish and Game	*California Aquatic Invasive Species Management Plan*	2008b
California Department of Fish and Game	*Abalone Recovery and Management Plan*	2005
California Department of Fish and Game and California Environmental Protection Agency	*Ocean Action Plan*	2004
California Department of Fish and Game	*Wildlife Action Plan*	2007
State Water Resources Control Board	*Marine State Water Quality Protection Areas, Areas of Special Biological Significance*	2003
Regional Water Quality Control Board	*Los Angeles Region Basin Plan*	1994
Catalina Island Management	*Catalina Island Conservancy Science Plan, Ecological Restoration Plan, and Education Plan*	

Naval Air Warfare Center Aircraft Division/Weapons Division Strategic Plan. The Strategic Plan flows from the vision, goals, and guidance of CNO and Commander, NAVAIR. The purpose of this Strategic Plan is to chart the Naval Air Warfare Center Aircraft Division / Weapons Division (NAWCAD/WD) course into the future. The plan articulates our continuing mission execution areas and enduring values. It also serves as an instrument to focus resources, make investments, and prioritize activities for efficient and responsive support to the Naval Aviation Program Executive Officers (PEOs), National Level 1 competency Leaders, and NAWCAD/WD Commanders.

San Clemente Island INRMP. An INRMP is being developed for SCI (Navy-owned) concurrently to this one.

Channel Island Recovery Plan, 1984. A Northern Channel Island Recovery Plan for plants has been developed by USFWS and a Southern Channel Island Recovery Plan for plants is in progress. The *Recovery Plan for the Endangered and Threatened Species of the California Channel Islands* 1984 covers federal listed species on San Clemente, Santa Barbara, and San Nicolas Islands.

Northern Channel Island Plant Recovery Plan, 2001. The Recovery Plan for 13 plant species in the Northern Channel Islands (completed 2001) covers endangered species: Hoffmann's rock-cress (*Arabis hoffmannii*), Santa Rosa Island manzanita (*Arctostaphylos confertiflora*), island barberry (*Berberis pinnata* ssp. *insularis*), soft-leaved paintbrush (*Castilleja mollis*), island bedstraw (*Galium buxifolium*), Hoffmann's slender-flowered gilia (*Gilia tenuiflora* ssp. *hoffmannii*), Santa Cruz Island bushmallow (*Malacothamnus fasciculatus* ssp. *nesioticus*), Santa Cruz Island malacothrix (*Malacothrix indecora*), island malacothrix (*Malacothrix squalida*), island phacelia (*Phacelia insularis* var. *insularis*), and Santa Cruz Island fringepod (*Thysanocarpus conchuliferus*). It also covers threatened species Santa Cruz Island dudleya (*Dudlyea nesiotica*) and island rush-rose (*Helianthemum greenei*).

Channel Island National Park's Resource Management Plan, 1999. A *Channel Island National Park Resource Management Plan* was implemented in1999. The plan encompasses four other islands in addition to San Miguel Island (Navy-owned), managed under a Memorandum of Understanding (MOU) with the Navy. Resources are currently engaged to update the plan (June 2009). As a part of the new management plan the NPS has implemented a wilderness study to determine if any NPS owned land within the park should be included in the National Wilderness Preservation System. The NPS owns or manages the majority of the five islands that make up CINP (Anacapa Island, Santa Cruz Island [30 percent], Santa Rosa Island, Santa Barbara Island and San Miguel Island [managed]). The USDOD owns or manages SCI, SNI, and San Miguel Island (owns but managed by NPS). The Channel Islands are geographically isolated from the mainland of California and are considered primarily as conservation areas with only Santa Catalina Island supporting an incorporated city (Avalon) and resident private land holdings.

Channel Islands National Marine Sanctuary Management Plan. The sanctuary, which surrounds the CINP to six nm from shore, has a separate five-year management planning process now in progress. Three newly proposed state MPAs near SNI (Assembly Bill 993 [Shelley] and the MLPA), will eventually be addressed in a CDFG-led Master Plan for MPAs.

National Park Service Channel Island Fox Recovery Plan. A recovery team was developed in 2004 with plans to write a recovery plan. The recovery strategy, modeled after USFWS recovery plans was completed in 2003. It lists recovery strategies and goal for the northern Channel Islands in regards to island fox populations.

Western Snowy Plover Recovery Plan, 2007. The *Western Snowy Plover Recovery Plan* was published in 2007. Recovery objectives in the recovery plan include:

- Achieving well-distributed increases in numbers and productivity of breeding adult birds; and

- Providing for long-term protection of breeding and wintering plovers and their habitat. As SNI has documented snowy plover breeding and wintering on the island, this plan is an important management document.

Brown Pelican Draft Post-Delisting Monitoring Plan, 2009. The *Draft Post-Delisting Monitoring Plan for the Brown Pelican* was published in 2009. The purpose of the Draft Plan is to track the status of the brown pelican over time and to verify that the pelican remains secure from risk of extinction after it has been removed from the protections of the Act (USFWS 2009). Post-delisting monitoring as described in the Draft Plan will fulfill the final process in the recovery of the brown pelican (USFWS 2009).

USFWS Five-Year Reviews. Several Five-Year Reviews for federal listed species have been implemented and completed. A five-year review is intended to indicate whether a change in a species listing classification is warranted. Changes in classification recommended in a five-year review could include delisting, reclassification from threatened to endangered (i.e. uplisting), reclassification from endangered to threatened (i.e. downlisting), or no change is warranted at this time. Of the federally listed species that are known to occur on SNI three species have recently gone under review. In 2005, the island night lizard was reviewed with a recommendation that no change to the classification of the distinct population segment at SNI is warranted at this time. In 2006, the western snowy plover was reviewed with no recommendations made to change its threatened status. In 2009, as a result of five-year review findings, the USFWS published a final rule in the FR to remove the brown pelican throughout its range from the list of endangered and threatened species.

BLM Resource Management Plan for California Coastal National Monument, 2005. Established in 2000 by President Clinton, the *Resource Management Plan for California Coastal National Monument* lays out a comprehensive approach to managing offshore rocks. The Plan outlines initial efforts focusing on interpretation and education.

California's Wildlife Action Plan, 2007. In 2000, the U.S. Congress enacted the State Wildlife Grants Program to support state programs that broadly benefit wildlife and habitats but particularly "species of greatest conservation need" (Bunn *et al.* 2007). As a requirement for receiving funding under this program, state wildlife agencies were to have submitted a Wildlife Action Plan (WAP; comprehensive wildlife conservation strategy) to the USFWS in 2005. The CDFG, working in partnership with the Wildlife Health Center at the University of California (UC), Davis, directed the development of the *California Wildlife: Conservation Challenges*, and concomitantly submitted the state's WAP in 2007 (Bunn *et al.* 2007).

California's Ocean Action Plan, 2004. Related to the California Ocean Protection Act, on 18 October 2004, Governor Arnold Schwarzenegger released an ocean action plan, *Protecting Our Ocean: California's Action Strategy*, with four primary goals:

- Increase the abundance and diversity of species in California's oceans, bays, estuaries and coastal wetlands;
- Make water in these bodies cleaner;
- Provide a marine and estuarine environment that Californians can productively and safely enjoy;
- Support ocean dependent economic activities.

Part of this ocean action plan is full implementation of the Marine Life Protection Act. Among other policies, the ocean action plan also addresses the relationship between California's management activities and USDOD as follows: coordinate California ocean and coastal management activities that impact military facilities/operations with USDOD, as well as requesting USDOD to coordinate their activities and operational needs with the State of California to the extent possible without compromising national security objectives (CDFG 2008).

California Marine Life Protection Act Master Plan for Marine Protected Areas, 2008. In 1999, the legislature approved and the governor signed the MLPA [Stats. 1999, Chapter 1015]. The MLPA required that CDFG develop a Master Plan to guide the adoption and implementation of a Marine Life Protection Program, which includes a statewide network of MPAs. The MLPA identifies a set of goals for the Marine Life Protection

Program including: conservation of biological diversity and the health of marine ecosystems; recovery of wildlife populations; improvements to recreational and educational opportunities consistent with biodiversity conservation; protection of representative and unique habitats for their intrinsic value; ensuring that MPAs have defined objectives, effective management and enforcement, and are designed on sound science; and ensuring MPAs are managed, to the extent possible as a network (CDFG 2008).

California Marine Life Management Act Nearshore Fishery Management Plan, 2002. Through its goals, objectives, policies, and mandates, the Marine Life Management Act (MLMA) provides a general framework for developing a management program for the nearshore finfish fishery. Management objectives and actions identified in the Nearshore Fishery Management Plan address the problems in the nearshore finfish fishery in way that promotes achieving the goals of the MLMA (CDFG 2002).

California Abalone Recovery and Management Plan, 2005. The California Abalone Recovery and Management Plan provides a cohesive framework for the recovery of depleted abalone populations in southern California. All of California's abalone species are included in this Plan: black abalone, red abalone (*Haliotis rufescens*), green abalone (*H. fulgens*), pink abalone (*H. corrugata*), white abalone (*H. sorenseni*), pinto abalone (*H. kamtchatkana* [including *H. k. assimilis*]), and flat abalone (*H. wallensis*). A recovery and management plan for these species is needed to manage abalone fisheries and prevent further population declines throughout California, and to ensure that current and future populations will be sustainable (CDFG 2005).

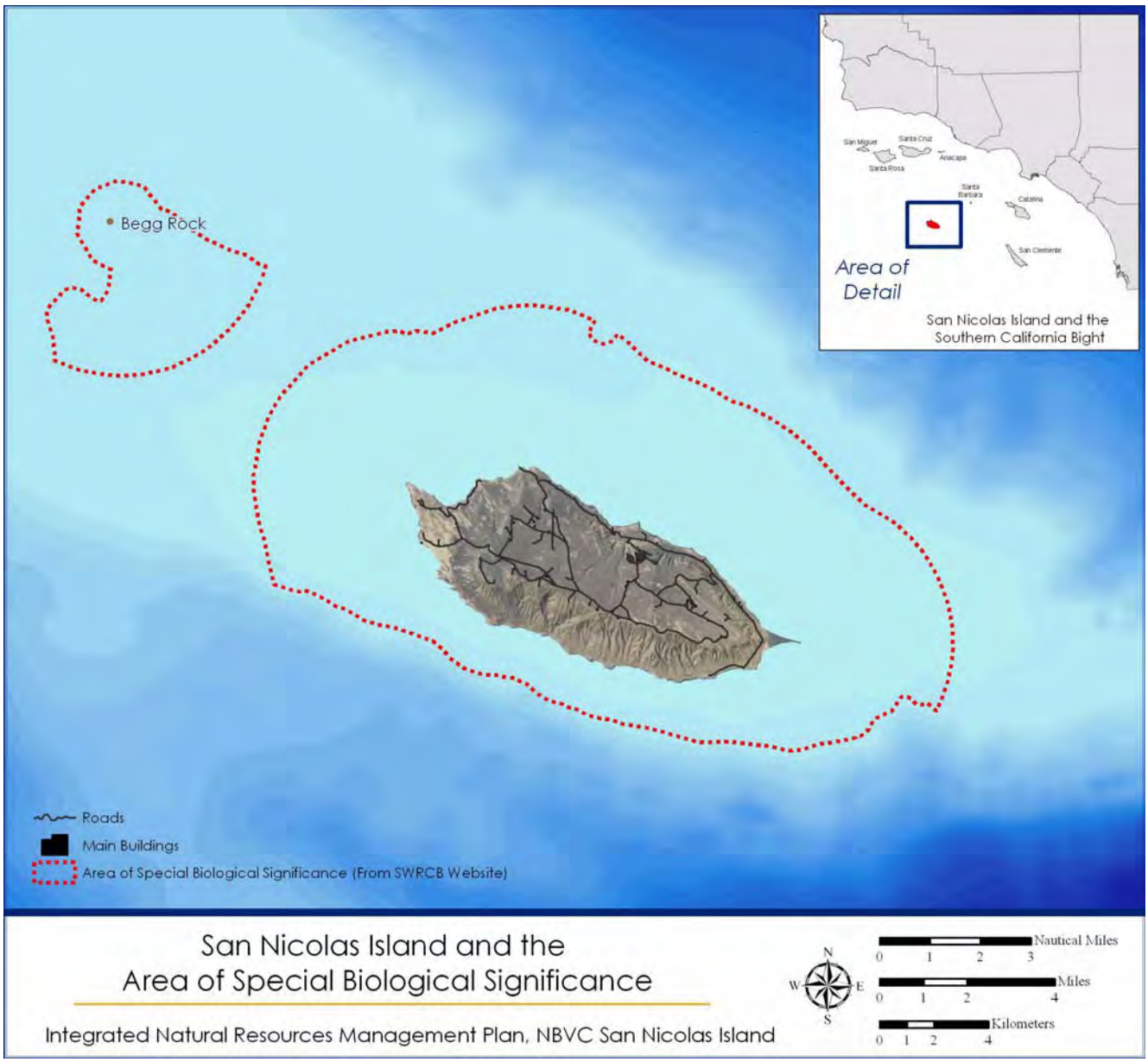
Regional Water Quality Control Board's Los Angeles Basin Plan. The Los Angeles Regional Water Quality Control Board's (RWQCB) Basin Plan is designed to preserve and enhance water quality and protect the beneficial uses of all regional waters. Specifically, the Basin Plan:

- Designates beneficial uses for surface and ground waters;
- Sets narrative and numerical objectives that must be attained or maintained to protect the designated beneficial uses and conform to the state's anti-degradation policy; and
- Describes implementation programs to protect all waters in the Region.

In addition, the Basin Plan incorporates (by reference) all applicable State and Regional Board plans and policies and other pertinent water quality policies and regulations.

Area of Special Biological Significance. Areas of Special Biological Significance (ASBS) are those areas designated by the State Water Resources Control Board (SWRCB) as requiring protection of species or biological communities to the extent that alteration of natural water quality is undesirable. The *Water Quality Control Plan for Ocean Waters of California* (California Ocean Plan) (SWRCB 2001) establish the concept of ASBS for the waters of California and require Regional Boards to recommend to the State Board areas suitable for this designation. Map 1-3 shows the boundary of the state designated ASBS surrounding SNI. Since most beneficial uses are to some degree mutually antagonistic, waste discharge requirements can at best provide relative protection for all beneficial uses. The concept of "special biological significance" recognizes that certain biological communities because of their value or fragility deserve very special protection consisting of preservation and maintenance of natural water quality conditions to the extent practicable (SWRCB 1976).

Catalina Island Management. The Catalina Island Conservancy has a science plan, ecological restoration plan, and an education plan currently in place to set the direction for managing Catalina's resources. A Trans-Catalina Trail has been opened recently, and hikers will be able to travel virtually the entire length of the Island on a dedicated 37.2 mile-long walking path. Cyclists will also be able to ride nearly the entire length of SNI.



Map 1-3. San Nicolas Island Area of Special Biological Significance boundary.

2.0 Military Use and Natural Resources Management

This Section describes both past and current use of natural resources on San Nicolas Island. Together with Section 3, which describes the natural resources themselves, a picture of the current condition of San Nicolas Island is provided. Based on an analysis of these base conditions, management strategies are developed in Section 4 and Section 5.

2.1 Historical Overview of Natural Resource Use

Over the years, human inhabitants and visitors utilized various marine and terrestrial natural resources that significantly altered the ecological conditions of SNI prior to military use. The preservation and management of existing natural resources requires an understanding of current and historical conditions, their impacts, and resulting ecological status.

Pre-Navy Land Use

Human occupation of SNI is believed to have started around 8,500 years before present (BP). The Native Americans inhabiting the island, the Nicoleño people, left over 550 archaeological sites as evidence of their occupation (USDON 2005b). The Nicoleños formed a subsistence strategy where the primary protein source was fish, with shellfish being a major secondary source, followed by marine mammals (Bleitz 1993; S. Schwartz, *pers. comm.*, 2009). Evidence of marine harvesting on SNI includes the remains of fish, marine mammals, and shellfish, as well as the tools required to harvest them.

Evidence from midden sites (discard locations for shells and bones) suggest that birds were also a food source. Marine mammals provided a rich food source when available while abundant fish and intertidal invertebrates (primarily abalone, mussels, and limpets) provided a more consistent food supply. One of several competing archaeological theories suggests that excavations of middens show that the Nicoleño people utilized the largest invertebrates first collecting the smaller individuals and species as supplies dwindled, eventually moving on to new locations or species (S. Schwartz, *pers. comm.*, 2009). Subsistence hunting and gathering by the Nicoleño people required skill and

ingenuity. Fishing by shell fish hooks and lines, and the use of nets were documented later during their occupation of the island (S. Schwartz, *pers. comm.*, 2009). The Nicoleño's intensive extractive use of marine resources did not likely affect the local ecology because the population was never high enough for their extractive practices to place any type of limit on the size of their population (S. Schwartz, *pers. comm.*, 2009).

San Nicolas Island was first discovered by Europeans in 1543 by the Spanish explorer Bartolome Ferrer, and received its present name when sighted by Spanish explorer Sebastián Vizcaino on Saint Nicolas's Day, 06 December 1602.

European use of the island began during the early 1800s when sea otter hunting became a profitable industry at the island (Schwartz 1994). Russian fur traders began using the island in the early 1800s for sea otter hunting and brought in Aleut hunters, who were very efficient at the "surround-hunting" technique. In 1811, a group of 25-30 Kodiak hunters from a Russian camp in Sitka, Alaska landed on the island to hunt otter and seal (California Mission Resource Center [CMRC] 2010). By the time the Russian Kodiak hunters were finally removed, there were less than one hundred Nicoleño people left on the island (CMRC 2010).

By the early 1800s, the Nicoleño population had decreased due to diseases introduced by Europeans which resulted in a decline of the occupation of Nicoleño villages on the island (S. Schwartz, *pers. comm.*, 2009). By the early 1830s, with the Nicoleño population in decline, the Franciscan missionaries organized the removal of all remaining Nicoleño people from SNI (CMRC 2010). The Peores Nada, captained by Charles Hubbard, landed on the island in 1835 and conducted the removal of the Nicoleño people from SNI (Ellison 1937; CMRC 2010).

San Nicolas Island, like many of the other Channel Islands, was not granted to an individual, but rather became the property of the U.S. government following the Mexican-American war in 1848 (under the terms of the Treaty of Guadalupe Hidalgo in 1848). Initially the U.S. governments jurisdiction over the island was limited. According to the terms of the Treaty of Guadalupe Hidalgo the acquisition of SNI by the U.S. government included a reservation of two 20-acre (8-ha) parcels on the southern ends of the island for lighthouse purposes (Junak 2008). Thus, in the mid-1800s other economic pursuits by various individuals occurred while the U.S. government began exercising its limited jurisdiction on the island.

Other european sea otter hunting groups began to use SNI following the removal of the Nicoleño people in 1835. These other european sea otter hunting groups are known to have brought in Kanakas (Hawaiians) and Mission Indians to hunt sea otters. The hunting of sea otters for their pelts was so profitable that American sea captains also began to enter the trade (Schwartz 1994). In the 1860s, Chinese abalone fishermen began fishing in SNI's tidal areas, setting up camp at the northwest end of the island (Schwartz 1994). At first, abalone were taken for their meat, but later became popular for their shells (Schwartz 1994).

Sheep ranching became the main economic pursuit on SNI starting around 1857 after the removal of the last of the Nicoleño people in 1835 (Schwartz 1994). Ranching on the Channel Islands did not have the same limitations as ranching on the mainland. Island ranchers did not need to fence in their flocks to prevent straying or encroachment. There were no threats from predators, such as bears, mountain lions, and bobcats, nor did ranchers face raids by Native Americans or poaching (O'Malley 1994). This allowed early ranchers to let sheep roam freely over SNI. This early practice, together with an excessive number of sheep, quickly caused the removal of most of the island's vegetation (Schwartz 1994; Junak 2008).

Martin Kimberly was the first large-scale grazing operation on SNI. Kimberly established his operation during the Era of Wool (1870-1880), the "heyday of the California sheep industry" (O'Malley 1994). Kimberly had around 800 sheep on SNI in 1860 which had increased to 3,400 sheep in the 1870 agricultural census. The number of sheep on SNI is said to have increased to around 15,000 after the 1860 count, but a two-year drought saw the flock size decrease to 1870 count (O'Malley 1994). Kimberly's operation on SNI ended in the 1870s, and though he tried to remove his sheep from SNI, an estimated 4,000 sheep are thought to have been left on the island (O'Malley 1994).

The most notable owner of SNI following Kimberly's departure was the Pacific Wool Company, that also operated on San Miguel Island and Anacapa Island. Pacific Wool Company operated on SNI for about a decade (1870s-1880s), but the operation failed in the end (O'Malley 1994).

In 1901 President Roosevelt increased the federal governments jurisdiction over the island by reserving the entire island for lighthouse purposes under the administration of the Lighthouse Bureau (Junak 2008). This change represented the first time that the U.S. government had acquired full jurisdiction over the island during its history of occupation and use of SNI.

The next large-scale ranching operation was in 1919 with E.N. Vail, who brought both a background and experience in managing livestock with a sensitivity to the island's natural resources (O'Malley 1994). Vail operated on SNI until 1934 under leases from the Lighthouse Bureau. During his operation, Vail moved his center of operations to the northeast shore, between the east end and Corral Harbor (Brooks Landing); he also built a pier and established a rest rotation system to protect SNI's vegetation (O'Malley 1994). Even though the Navy took up ownership of SNI in 1933, sheep ranching continued on the island until World War II under Roy Agee and L.P. Elliott (O'Malley 1994).

In the 1920s or early 1930s, the Civilian Aviation Authority built two emergency dirt landing strips 2,300 feet (701 m) and 2,100 feet (640 m) long. In January 1933, the Civilian Aviation Authority relinquished the airstrips as the Navy took over ownership of SNI.

Historic Navy Land Use

In 1933, control of SNI was transferred to the U.S. Navy by an EO of President Hoover. In August of 1933, The Navy set-up a weather station at the Brooks Landing sheep ranch. The U.S. Army was given temporary control of SNI in November 1942. During the Army's occupation it was intended to be used to base a squadron of early warning aircraft and an airstrip was built near today's airfield to support that intended use (Junak 2008). In 1944, SNI was returned to Navy control, and in 1947, the island was placed under the control of NAS Point Mugu as part of the Naval Air Missile Test Center (Schwartz 1994; Junak 2008).

2.1.1 Summary of Human Use and Change

A large body of research exists on the biology, climatology, geology, human history and natural history of the Channel Islands. Much of this work is either found or referenced in the proceedings from a set of multidisciplinary symposia dedicated to the study of the islands (Philbrick 1967; Power 1980; Hochberg 1993; Halvorson and Maender 1994). According to Schwartz's analysis of the ecological ramifications of historic occupation of San Nicolas Island, the current environment is far from "pristine" (Schwartz 1994). Past land uses (including overgrazing by sheep) have affected the composition and distribution of plant communities and individual species on SNI. The full extent of the changes are unknown because of the lack of biological monitoring or periodic biotic surveys. It is assumed (and anecdotal evidence supports the hypothesis) that the island biota is slowly recovering from the grazing damage (Halvorson *et al.* 1996). The terrestrial ecosystem has been affected by sheep ranching, military facility construction, the introduction of plants for erosion control, and miscellaneous grading activities (Schwartz 1994; Junak 2008). Since the early 1960s, 110 new records of non-native plant taxa have been documented (Junak 2008). The flora of SNI has the highest percentage (46%) of non-native plants of all the California Channel Islands. The non-native plants contribute significantly to the plant coverage on the island (Junak and Vanderwier 1990; Halvorson *et al.* 1996). These introductions have been associated primarily with disturbances caused by sheep grazing and military activities. Several are potentially invasive species and have recently been introduced to SNI and threaten the well-being of the sensitive native species. Based on his analysis, Schwartz recommends that historic factors should be addressed in plans to "restore" the island; especially decisions as to what time period and what type of ecosystem to use as a restoration goal (Schwartz 1994).

The introduction of non-native plants on SNI has increased dramatically since the Navy took over the island in the 1940s (Junak 2008). While it is likely that sheep were to some degree controlling immerging non-native plants during peak grazing periods many new introductions have been associated with gravel and other construction materials that have been brought to the island unintentionally during the Navy's occupation and use. By 1969, 63 non-native plant species had been recorded on SNI and by 2005 that number had increased to 141 (Junak 2008). Currently the Navy environmental staff has been making a concerted effort to control and/or eliminate new introductions but staffing and funding levels have been limited.

Some components of SNI's native vegetation have recovered dramatically since the sheep ranching era. Woody plants that were documented as rare by Blanche Trask in 1887 are now common on the island (Junak 2008). The island landscape has been transformed since the 1800s from years of sheep grazing and subsequent erosion of top soil. The recovery of native plants and their associated communities are variable based on localized conditions and exposure; however, adaptive management focused on minimizing soil disturbance and avoiding non-native plant introductions has contributed to the expansion and colonization of many native plants into new areas.

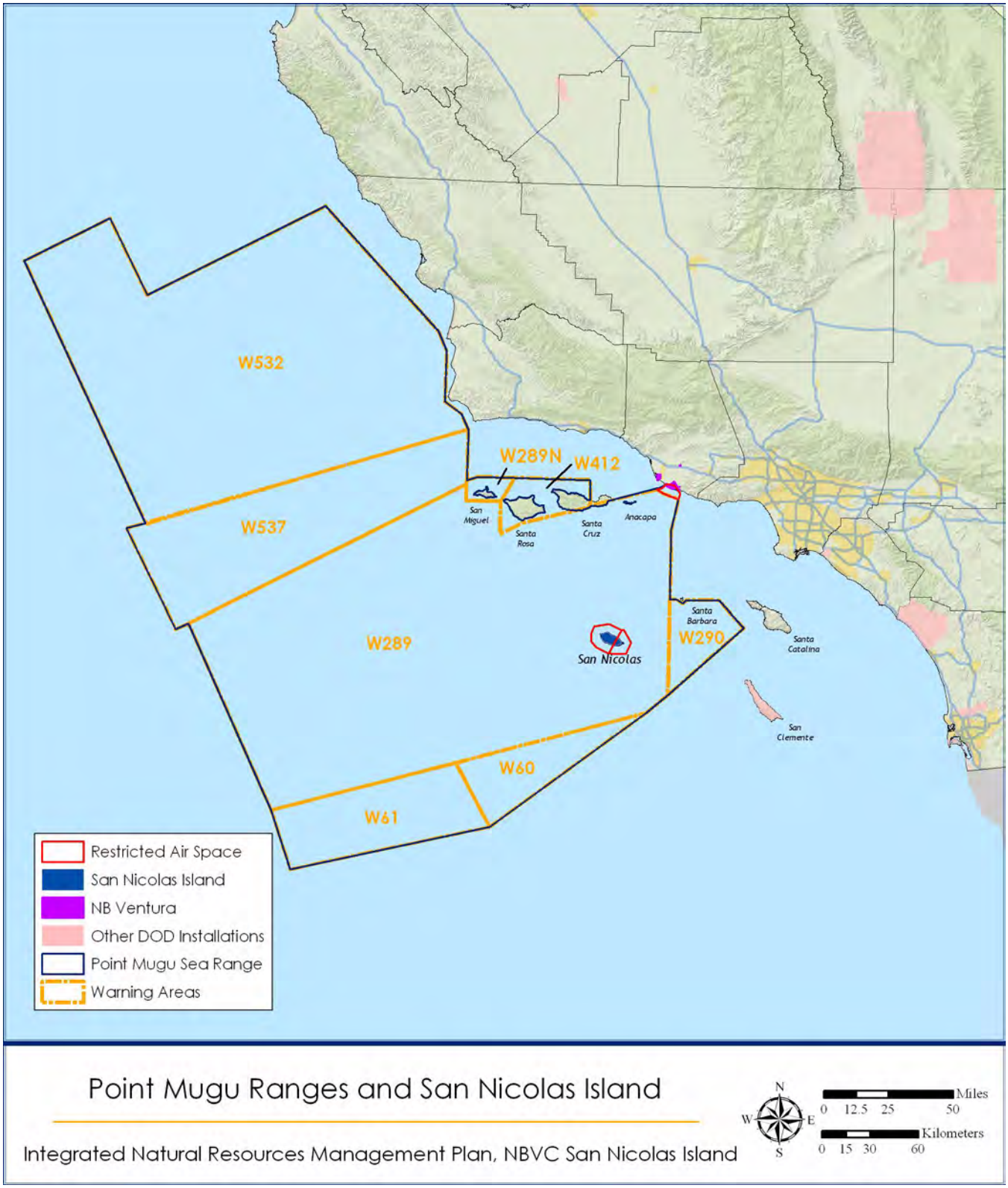
The marine ecosystem has been affected by marine mammal hunting, kelp harvesting, and shellfish collecting (Schwartz 1994). According to the California WAP for the Marine Region, the direct effect of overfishing has become evident through the harvest of millions of fish every year (Bunn *et al.* 2007). The Southern California commercial passenger fishing-vessel fleet alone caught an average of 4.25 million fish a year between 1963 and 1991; notably, despite a consistent fleet size of approximately 200 boats since 1991, this figure has decreased to 2.5 million fish a year (Dotson and Charter 2003). Regulations placed on fisheries were often not precautionary, and commercial and recreational fishermen had the equipment and technology to catch whatever the regulators would allow. As of 2003, 36 percent of United States' commercially harvested stocks (those for which we have enough information with which to assess their status) are officially categorized as overfished; another 21 percent are classified as "experiencing overfishing" (NMFS 2004). In the 1990s, state and federal governments began to realize that some populations of species caught off this country's coasts, including in California, were in decline. In addition, the overall fishing capacity of some commercial fleets was too large compared to the stocks that they were harvesting. In response to these conditions, California began implementing restricted-access policies in some commercial fisheries. Other management actions taken in recent years due to declining stocks have included area closures, such as prohibiting bottom fishing over much of the continental shelf to allow several species of depressed rockfish to recover, which has resulted in significant economic hardship to both commercial and recreational sectors.

2.1.2 Overview of San Nicolas Island Operations

San Nicolas Island's primary mission is to support the RDT&E of Air Weapons and associated aircraft systems into strike, anti-surface, and anti-air warfare aircraft within the NAWCWD PMSR (NAVFACSW 2010a). In support of this mission SNI serves two primary functions: as a launch platform for short and medium missile testing, and as an observation facility for missile testing (NOLF SNI 2003).

The PMSR is used by U.S. and allied military services to test and evaluate weapon systems associated with air warfare, missiles and missile subsystems, aircraft weapons integration, and airborne electronic warfare systems to provide realistic training opportunities and to maintain the operational readiness of these forces (NAWCWD 2002). This test and evaluation process is critical to successful assessment, safe operation, and improvement of the capabilities of current and future naval weapon systems.

Military training, testing, and evaluation operations directed by NAWCWD PMSR utilize an array of locations and areas including developed facilities, remote launch pads, beaches, air space, and nearshore waters on and around SNI (See Map 2-1). Requirements for specific training and testing exercises can involve the integration of multiple facilities and locations expanding the footprint of exercises to several thousand square miles. The majority of SNI operations involve the electronic evaluation of missile systems utilizing various radars and global positioning systems (GPS).



Map 2-1. San Nicolas Island and Point Mugu Sea Ranges.

2.1.2.1 Sea Range Weapons System Tests

Currently, the facilities associated with military land uses at SNI support five general categories of tests to evaluate sea, land, and air weapons systems conducted on the NAWCWD PMSR. These general categories of weapons systems tests include:

- Air-to-air tests
- Air-to-surface tests
- Surface-to-air test
- Surface-to-surface tests
- Subsurface-to-surface tests

While the operations partitioned into the above categories are not necessarily exclusive to SNI they represent the PMSR and complexity of operational training and testing that may occur on SNI at anytime. Considering the demands of weapons testing research and development not every scenario is presented in this section, rather a brief overview of typical testing logistics that pertain to the military use of SNI.

Air-to-Surface Weapons System Testing. Air-to-surface weapons system testing involves weapons using a missile, bomb, inert mine shape, or any other object released from an aircraft designed for attack of an enemy surface target. Targets for the air-to-surface scenario are floating surface targets or the missile impact area on the western tip of SNI (NAWCWD 2002). The air-to-surface scenario involves testing weapons that support the air warfare mission including testing a ship's defensive weapons systems for defense against an enemy airborne target or threat. Missile impact altitudes for air-to-surface tests are dependent on the type of missile or target being tested and altitudes can range from less than 100 feet (30 m) for GQM-163A Coyote targets to 80,000 feet (24,238 m) for AQM-37s (NAWCWD 2002; S. Schwartz, *pers. comm.*, 2009).

Surface-to-Surface Weapons System Testing. Surface-to-surface testing involves missiles fired from a surface vessel against a surface target, which is either another ship or a land target. The test article can be captive-carry using an inert missile, missile with telemetry and a live rocket, or the actual firing of a live missile. Air support is required from the range to provide chase aircraft and safety procedures are implemented to clear the target operational area (NAWCWD 2002).

Subsurface-to-Surface Weapons Systems Testing. Subsurface-to-surface scenario involves a submarine's weapon system to attack a surface or land target. Missiles are fired from a submarine in the PMSR at a surface target (hulk) on the Sea Range similar to those discussed in the air-to-surface scenario. The air support required from the range to clear the target operational area and provide chase aircraft is identical to the surface-to-surface scenario (NAWCWD 2002).

2.1.2.2 Sea Range Ancillary Operations Systems

Ancillary Operations Systems are those systems that support routine PMSR operations and include systems such as radars, communications, lasers, chaff, and flares that are used in conjunction with the five typical weapons test scenarios discussed previously. Only the Ancillary Operations Systems that are located on SNI are discussed in this INRMP. The Ancillary Operations Systems located on SNI that are used by the PMSR include a variety of radar and communication systems.

Sea Range Radar Systems. The NAWCWD uses a variety of surveillance radars and display systems to detect and track aircraft and surface vessels on or near PMSR and provide a complete picture of all of the activity within line-of-sight on the range, including both participants and non-participants. Metric radar systems are distinctly different from the surveillance systems by producing electronic data to generate time, space, and position information. Some metric radar systems have over-the-horizon capability through line-of-sight airborne relay with positioning accuracy enhanced by the use of GPS satellites (NAWCWD 2002). The PMSR also employs an extensive array of high-speed photo-optical equipment from both ground based and airborne platforms to record test and training activity (NAWCWD 2002).

Sea Range Communication Systems. San Nicolas Island communication systems include voice communication systems (telephone), radio communication systems (satellite interfaces), a PMSR connectivity structure, video systems, and range timing system. A full range of communication systems provides the means to conduct effective testing and training activities on the PMSR. The communication services also provide for sea, land, and area clearance, range instrumentation connectivity, missile flight safety, target control, and target recovery operations. Fiber Optics Communications Underwater System (FOCUS) connects Point Mugu with SNI via a redundant system of fiber-optic cables and handles both voice and data transmission needs (NAWCWD 2002).

2.1.2.3 Sea Range Training

Military training land uses at SNI also support four general categories of training that include: fleet exercise training, littoral warfare training, small-scale amphibious warfare training, and aircraft training operations (NAWCWD 2002). These PMSR training activities occur in waters surrounding SNI and instrumentation on the island is used to record and evaluate the operations.

Fleet Exercise Training. A Fleet Exercise (FLEETEX) is a generic term which broadly encompasses a variety of Fleet training activities including but not limited to missile exercises, aircraft operations, joint training activities (e.g. Air Force and Navy), tactical training, and Fleet battle experiments. FLEETEXs are major Naval training events designed to exercise a Battle Group's war fighting capabilities as they are intended to function in actual combat (NAWCWD 2002).

Littoral Warfare Training. Littoral warfare training is conducted by the Marine Corps and by Navy Special Warfare forces involving operations on land and on sea that encompass amphibious operations that include shore assaults, boat raids, airfield seizure, humanitarian assistance, and light-armor reconnaissance. Environmental criteria associated with littoral warfare training at several SNI beach locations at various times of the year provide criteria used to determine when special warfare operations or small-scale amphibious training can be conducted at the island. Constraints are associated with seasonal marine mammal shore activity and bird nesting behavior. Since the Fleet routinely uses other ranges for littoral warfare and amphibious landing training, units become familiar with the training grounds. Therefore, in order to adequately evaluate their training skills prior to deployment, unfamiliar ground is required. Deployment of personnel is performed by small inflatable boats, helicopters, or aircraft limited to the insertion and extraction of troops to and from the SNI airstrip or other approved areas (NAWCWD 2002).

Amphibious Warfare Training. Amphibious warfare training exercises have been conducted at various locations on and surrounding SNI and are carefully selected to avoid or minimize damage to vegetation, wildlife, or cultural sites. Several alternative sites have accommodated shore landings, boat raids, and combat rubber boat landings including Daytona Beach (where resupply barges routinely land) and Redeye Beach. Additionally, search and rescue missions can be accomplished on beach areas near the old jetty on Coast Guard Beach, the missile impact targets, and the Vandal launch pad (NAWCWD 2002).

Aircraft Training Operations. San Nicolas Island aircraft training operations typically occur in a supportive role to other training and testing operations because of the limited support services available at the SNI airfield and the proximity of NAS Point Mugu. An aircraft sortie consists of a takeoff, the assigned mission, and a subsequent landing. Sorties typically last only a few hours. The PMSR is divided into defined areas to allow for multiple events to occur simultaneously and to afford a safety margin for test and training activities (NAWCWD 2002). The Control Area Extensions (CAE) are areas through the Sea Range that are used by commercial and civil aircraft flying on assigned air traffic control routes. The CAEs can be requested and closed by NAWCWD Point Mugu when necessary and standard entry and exist points into the airspace over the Sea Range are not used.

2.1.2.4 Point Mugu Sea Range and NOLF SNI Operations Areas

NBVC SNI lies within the southeastern portion of the NAWCWD PMSR (Map 2-1) and provides an isolated centralized testing and evaluation location. The NAWCWD PMSR is comprised of various training ranges configured to isolate use areas and utilize the geographic diversity of the area to perform testing and evaluation of weapons systems.

There are no officially designated Ranges on the land at SNI. The PMSR has established two airspace Restricted Areas over SNI that extend three nm (5.6 km) around the island. San Nicolas Island also lies within Warning Area 289 airspace (Map 2-1). Most of SNI is used as a range instrumentation site to support PMSR operations. Island operations can be grouped into a few key locations: Alpha Launch Complex, B-807 Launch Site, Missile target area, and the Tomahawk soft recovery area.

Alpha Launch Complex. The Alpha Launch Complex is on the island's central plateau, at its western end at an elevation of over 620 feet (189 m) above mean sea level (amsl) and accommodates the Vandal launcher and various other concrete pads, which are used to launch missiles and targets from mobile or portable launch stands.

B-807 Launch Site. The 807 Launch Site is on the western shoreline at an elevation of over 30 feet amsl and consists of a number of concrete pads where there is either a permanent 50k launch rail or where portable missile launchers can be bolted down, or portable launchers can be parked (S. Schwartz, *pers. comm.*, 2010). A wide variety of missiles have been launched from here over the years, but typical launches today are various missile configurations that use a Terrier booster with differing second stages (USDON 2005; S. Schwartz, *pers. comm.*, 2010).

Missile Target Area. The only impact area on the island is a missile target area used for a variety of precision-guided, non-warhead missiles (S. Schwartz, *pers. comm.*, 2009).

Tomahawk Soft Recovery Area. A soft recovery area has been established on the eastern end of SNI to support Tomahawk launches on PMSR to take into account instances when missile flights must be terminated, but the missile can be controlled to fly to a designated area. A ground crew can then pick up the missile with assistance of a truck or helicopter (NAWCWD 2002).

2.1.2.5 Safety Analyses and Planning

Point Mugu Sea Range Safety Analyses and Planning

Safety analyses and planning are integral parts of operations prior to the execution of any event on the PMSR and safety documentation begins with the preparation of either a Range Safety Approval (RSA) or a Range Safety Operational Plan (RSOP) (NAWCWD 2002). These are similar planning documents, except that an RSOP applies to missiles requiring a flight termination system (FTS) controlled by a Missile Flight Safety Officer (MFSO). Since most missiles fired on the PMSR do not carry live warheads, most impact areas are relatively small (NAWCWD 2002). Computer models are used to determine the size and location of the impact area into which debris may fall. These predictions are calculated based on altitude, speed, mass of debris pieces, angle of impact, and winds. Impact areas for missiles used on the PMSR are generally oval in shape and can be up to 10 nm (19 km) long and 7 nm (13 km) wide (NAWCWD 2002).

The Sea Range safety policy, procedures, and guidance are covered in NAWCWD Instruction 5100.2. This document defines range safety requirements, criteria, the safety planning process, and operational procedures. Although the Commander of NAWCWD has the ultimate responsibility for range safety, the authority for execution of these safety programs is delegated to the PMSR Safety Officer in the Range Safety Office. Public access and proximity to the PMSR is a principal safety consideration since most of the PMSR is in non-Territorial Waters and open to the public.

San Nicolas Island Safety Analyses and Planning

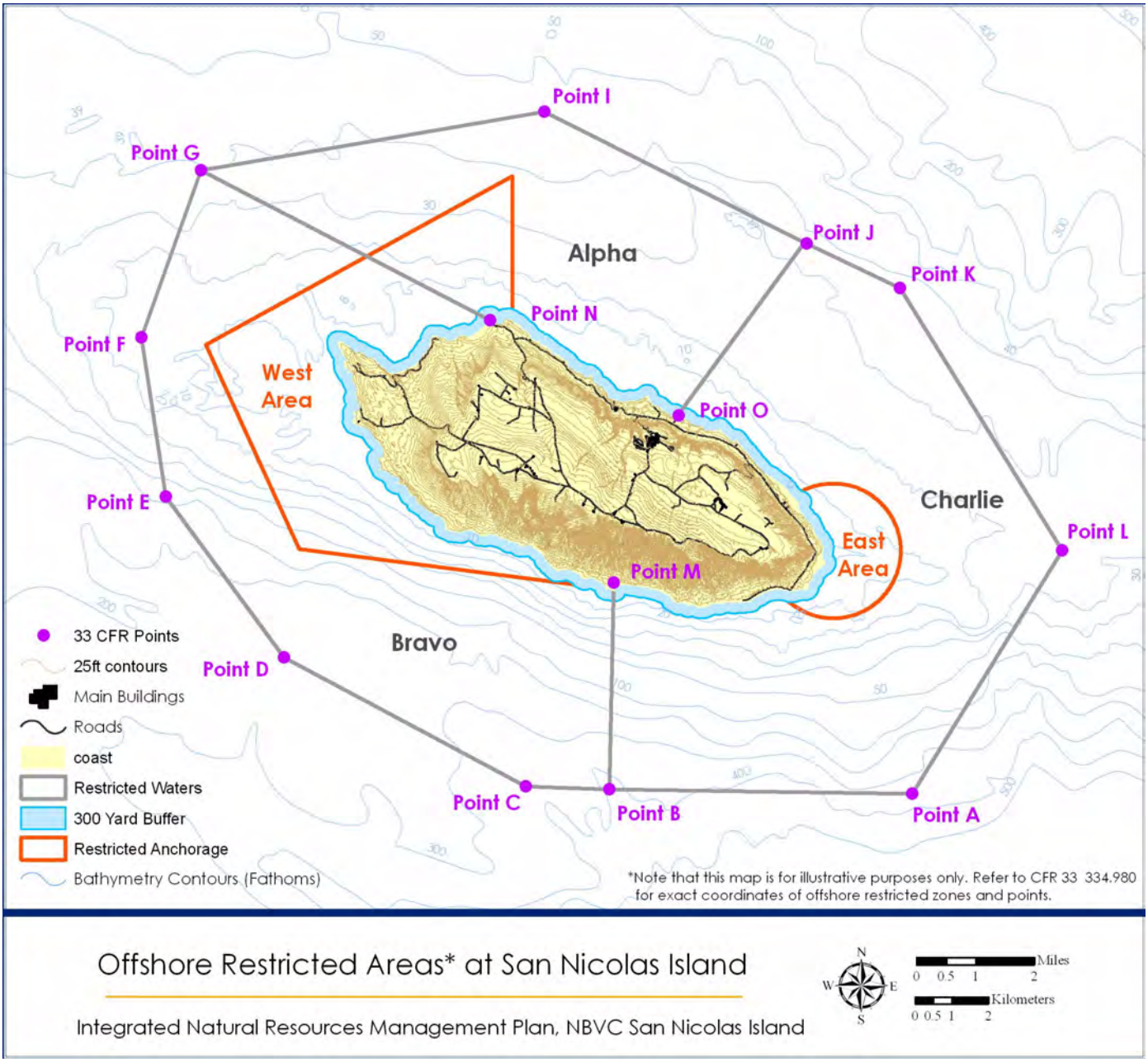
San Nicolas Island supports a significant portion of tests conducted within the PMSR and contains expansive safety zones related to surface craft and airspace. NAWCWD implements advance Notice to Airmen (NOTAM) and Notice to Mariners (NOTMAR) as well as range safety clearance prior to conducting any tests that might be hazardous to non-participants. Access is granted for military related activities and for pre-approved, non-military uses, primarily for scientific purposes. The safety policy of NAWCWD is to observe every reasonable precaution in the planning and execution of all operations that occur on the Sea Range and SNI to prevent injury to people and damage to property (NAWCWD 2002).

Surface Restricted Areas. Restricted area regulation at SNI pertains to the waters of the Pacific Ocean that surround the island and that extend seaward about three miles (4.8 km) from the shoreline (33 CFR § 334.980). Three Naval restricted surface areas are located around SNI: Alpha, Bravo, and Charlie (Map 2-2). These areas are used on an "as-required" basis only, and public access is restricted only at those times when military exercises are being conducted. Procedures exist for the notification of the commercial shipping and recreational boating communities of potentially hazardous activities on the Sea Range and SNI through the NOTMAR and daily VHF-FM Marine Radio (Channel 16) broadcasts. NAWCWD Point Mugu issues NOTAM and NOTMAR 24 hours in advance of Navy activities that require exclusive use of an area. Surveillance aircraft are regularly used to ensure that surface vessels are not present within safety zones. The number of closures per year can fluctuate substantially, but there are periods of several months or more with no closures (NAWCWD 2002).

Restricted Air Space. The PMSR has established two airspace Restricted Areas over SNI that extend 3 nm (5.6 km) around the island. The two areas are divided by an imaginary line from the north side to the south side of the island where the Bravo boundaries intersect the shorelines; they extend from the surface to 100,000 feet (30,500 m) (NAWCWD 2002). Map 2-2 also shows warning zones associated with missile and target launches form the west end of SNI. Non-participating aircraft are precluded from entering SNI's Restricted Area airspace (NAWCWD 2002). The only authorized air traffic into the SNI airfield is that approved by NAS Point Mugu and generally include aircraft involved in testing and evaluation activities, training on the PMSR, and scheduled contract passenger flights which bring duty personnel, researchers, or other permitted visitors to the island. When Warning Area W-289 is being used in the Sea Range for military testing and training operations, the Navy notifies commercial, civilian, and other military aviation through a NOTAM. Use of civilian air corridors are controlled by the Federal Aviation Authority (FAA) and its Air Traffic Control (ATC) agencies. NAWCWD can request closure of one civilian air corridor at a time (S. Schwartz, *pers. comm.*, 2010).

Accident Potential Zones. Due to SNI's isolation from civilian communities, an Air Installation Compatibility Use Zone (AICUZ) study has not been conducted. AICUZ studies are necessary to analyze air operations, noise zones, Accident Potential Zones (APZs), and existing land use encroachments in the vicinity of the airfield. APZs and Community Noise Equivalent Levels (CNEL) have not been determined at SNI and may significantly impact Nicktown and PWD facilities. USDOD criteria for airfield safety indicate that many of the Nicktown facilities are inappropriately located within the approach/departure clearance zones (Buildings 118, 99, 326, 151, 153, 2, 111, 215, 25, 126, 74, 228, 24, 75, and 150) (SNI 2003).

Land Restricted Areas. Naval security personnel secure land restricted access zones prior to and during launch activities at the west end of the island to prevent unauthorized personnel and non-participants from entering the area. Roads into Warning Zone 2 are blocked during launches, and personnel in Warning Zone 2 are required to be in protected blockhouses or shelters during launches. No personnel are allowed in Warning Zone 1 during missile or target launches or during missile impacts at the missile target site. In addition, clearance areas are cleared of all non-participating civilian commercial fishing or recreational boats prior to launch activities (NAWCWD 2002).



Map 2-2. Surface restricted areas at San Nicolas Island.

Electromagnetic Radiation Hazards. The Navy operates a variety of equipment and facilities at SNI that generate electromagnetic radiation (EMR). EMR emissions on SNI cause concern in terms of Hazards of Electromagnetic Radiation to Personnel (HERP) and Hazards of Electromagnetic Radiation to Ordnance (HERO). A large concentration of EMR emitting systems can be found on SNI due to its instrumentation involvement with the PMSR (SNI 2003).

There are numerous emitters on SNI that exceed HERP limits from less than a few feet to many hundreds of feet with their illuminated volume. Most of the transmitting systems at SNI can create a HERP condition only if a person were to get sufficiently close to an emitting antennae where the concentrated power would be dispersed over a very limited area. For a HERP condition to exist on SNI, personnel would have to move into a volume of space illuminated by an emitting system. This would require a person to be on a tower, building roof, or suspended in free space 20 feet (6 m) or more in the air. Sources of emissions for HERP arcs include radars, transmitters, relay links, transmitting antennae fields, and a command destruct system (SNI 2003).

There are several sources of emissions for HERO arcs. Within a HERO arc, there is the risk of unintentional actuation of electro-explosive devices or otherwise electrically activating ordnance because of radio frequency electromagnetic fields. This unintended actuation could have safety or reliability consequences (NOLF SNI 2003).

Currently, there are no HERP or HERO zones that extend into Nicktown and PWD areas (NOLF SNI 2003).

Explosive Safety Quantity Distance Arcs. Various munitions and targets are stored and maintained at SNI that are susceptible to the effects of EMR. These include missile warheads, rocket motors, high explosives, and other types of ordnance that are used in the testing or training activities occurring on the PMSR. Munitions arrive on the island either by surface ship or by air transport (NAWCWD 2002).

There are five ordnance storage or handling facilities at SNI. They are all located at the far northwestern portion of the island. Facilities 105, 106, and 107 are High Explosive Magazines. Facilities 110 and 290 are Ordnance Assembly Buildings that are located near the Alpha Launch Complex. There is also an Explosive Ordnance Disposal (EOD) site that is located close to the center of the Island (NAVFACSW 2010a).

EOD uses SNI for large disposal operations and supports all of NBVC. Anything over 10 pounds (lbs) (4.5 kilograms [kg]). Net Explosive Weight (NEW) must be taken to the island for disposal. San Nicolas Island facilities can handle 100 lbs (45 kg). The NEW for working disposal operations and up to 200 lbs (91 kg) NEW emergency disposal operations (NAVFACSW 2010a). Disposal operations are conducted on SNI at the EOD Demolition Range atop the ridge.

Explosive ordnance storage and/or handling facilities on SNI that generate Explosive Safety Quantity Distance (ESQD) arcs are listed in Table 2-1.

Table 2-1. San Nicolas Island ordnance facilities and associated ESQD arcs (NOLF SNI 2003).

Facility No.	Description	Ordnance Type	ESQD Arc Radius (Ft.)
None	EOD Site	N/A	1,800
105	High Explosive Magazine	CL-1, Div. 1	1,855
106	High Explosive Magazine	CL-1, Div. 1	1,855
107	High Explosive Magazine	CL-1, Div. 1	1,855
110	Ordnance Assembly Building	CL-1, Div. 1	1,250
290	Ordnance Assembly Building	CL-1, Div. 1	1,250

No habitable development should exist within these ESQD arcs. There are no inhabited buildings within the ESQD arcs on SNI, and no waivers or exemptions are in effect. There are also no ordnance storage or handling facilities within Nicktown or PWD areas (NOLF SNI 2003).

2.1.3 Facilities

All development on SNI is associated with the military, and land uses and facilities have most recently been categorized and assessed in the NBVC San Nicolas Island and Fort Hunter Liggett Activity Overview Plan (NAVFACSW 2010a). According to the Activity Overview Plan land uses and facilities have been categorized by their mission criticality as Mission Critical, Mission Support, or Quality of Life.

Mission Critical. Mission critical lands and facilities are those which directly support the mission of the installation and tenants. Mission critical functions aboard SNI include Airfield Operations, RDAT&E Operations, and the Natural and Cultural Resource Management Program.

Natural and Cultural Resource Management Program Facilities. Along with the Sea Range Operations, SNI hosts an Archeology and Biology Laboratory (NAVFACSW 2010a). Given the vast number and variety of cultural and natural resources found on the Island, these facilities play a very important role. These facilities are located approximately one mile northwest of the Community Support area and Public Works areas, on the northern side of SNI.

For more information on Airfield or RDAT&E facilities refer to *Section 2.1.3.2: San Nicolas Island Airfield and Waterfront Operations Facilities* or *Section 2.1.3.1: San Nicolas Island Sea Range Instrumentation Facilities* respectively.

Mission Support. Mission support lands and facilities are those which indirectly support the mission of the installation and tenants. Mission support functions aboard SNI include Administration, Communications (non RDAT&E), Circulation, General Maintenance, Public Safety, Supply, Utilities, Vehicle Maintenance, and Weapons.

Administration Facilities. Building 152, in the center of the Community Support Area, houses the main administrative functions for SNI. In addition, Public Works, MWR, and the galley also have administrative space requirements. The Range Management Office is located in Building 98. The CDFG, USFWS, and Facility Engineering and Acquisition Division (FEAD) are located in Building 19, which is designated as general maintenance. A portion of Building 66 provides office space for Transportation and a Transportation Customer Service Counter. During the preparation of the Activity Overview Plan, EOD and housing services both requested administrative space on the Island to better accommodate their daily operations (NAVFACSW 2010a).

General Maintenance Facilities. General maintenance is performed by NAVFAC SW PWD (NAVFACSW 2010a). These facilities are located within the Public Works Compound west of the Community Support Area.

Public Safety Facilities. The fire station and security building are co-located at the airfield. These facilities are located here to meet all response times and meet strategic location goals (NAVFACSW 2010a).

Storage Facilities. Storage facilities are located within the Community Support Area in Building 63 (housing services and galley storage). Building 66, located at the airfield is used for air cargo support (NAVFACSW 2010a).

Vehicle Maintenance Facilities. Vehicle maintenance is provided by Public Works within the Public Works compound. Facilities consist of vehicle maintenance bays and covered storage for construction equipment (NAVFACSW 2010a).

For more information on Communications (non RDAT&E) facilities refer to *Section 2.1.4.2: Utilities*; for more information on Circulation and Utilities facilities refer to *Section 2.1.4: Transportation and Utilities*; or for more information on weapons facilities refer to *Section 2.1.2.5: Safety Analyses and Planning*.

Quality of Life. Quality of life lands and facilities are those which support the well-being of the warfighter. Quality of life lands and facilities include Bachelor Housing, Community Support, and Medical/Dental.

Bachelor Housing Facilities. There are 11 housing facilities on the Island with accommodations for 162 personnel, both military and civilian, permanent and transient (NAVFACSW 2010a; S. Schwartz, *pers. comm.*, 2010). All housing is located within the Community Support area.

Community Support Facilities. San Nicolas Island community support facilities are comprised of mostly outdoor and indoor recreational facilities, but also include the galley and MWR facilities. These facilities are located in the Community Support Area also known as "Nicktown", which is located approximately one mile northwest of the airfield, on the northern side of the Island. Food for all personnel on-Island is prepared in the galley facility in Building 111. The galley provides breakfast, lunch, and dinner to personnel during the day (NAVFACSW 2010a). For more information on Community Support area recreational or MWR facilities refer to *Section 2.2.4.1: Recreation for SNI Personnel at SNI Onshore Areas*.

Medical/Dental Facility. The medical facility (Building 58) is located just outside the Community Support area and the Public Works area, at the southwestern corner of Owen Road and Public Works Circle intersection (NAVFACSW 2010a).

2.1.3.1 San Nicolas Island Sea Range Instrumentation Facilities

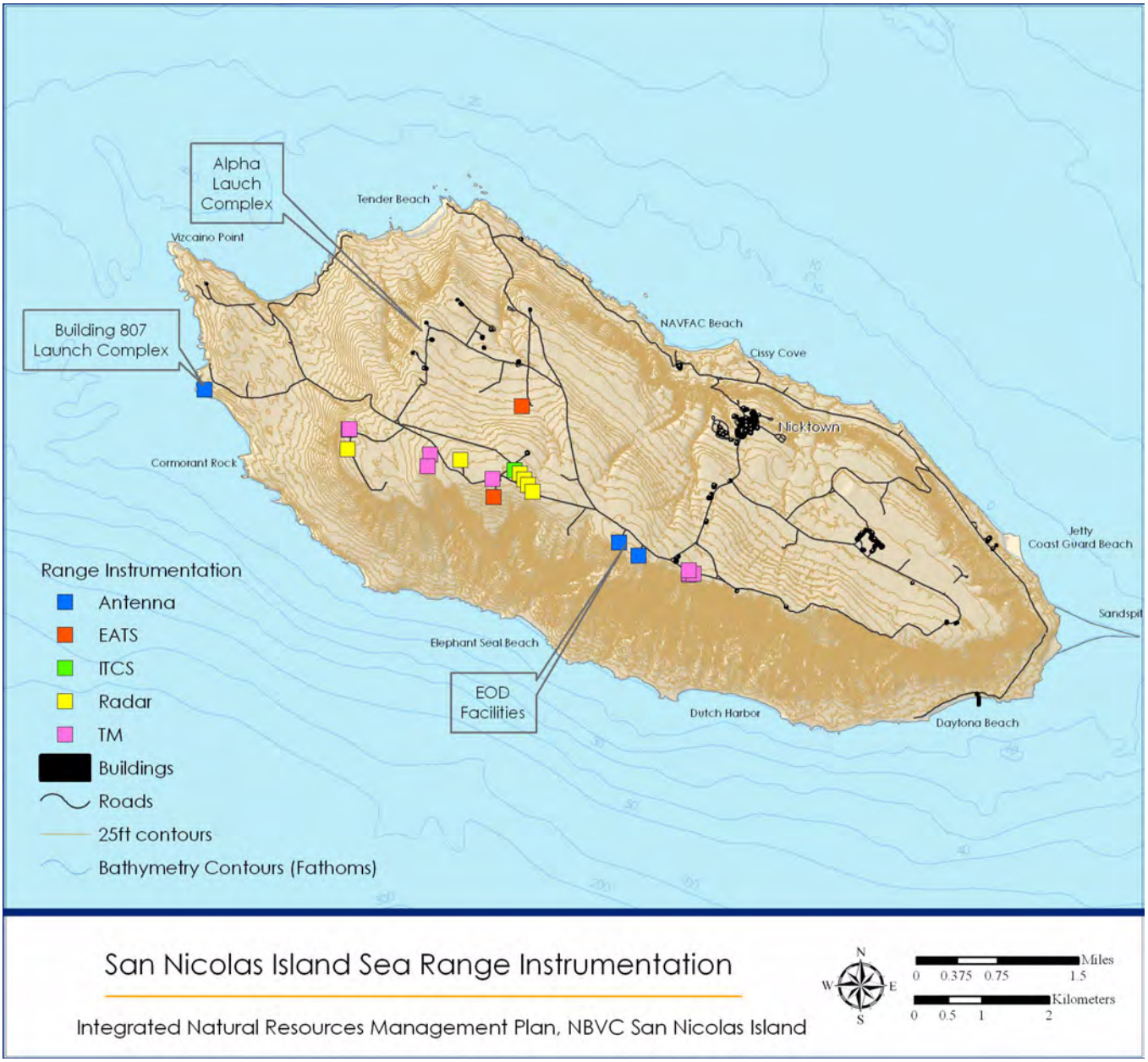
Because of its strategic location, SNI can be used to mimic shipboard launches of missiles and targets. Mission Critical Island facilities support all aspects of Range Operations, such as missile and target launches. San Nicolas Island houses an array of buildings and complexes for specialized testing and evaluation projects. The Alpha Launch Complex is located inland in the northwest portion of the island, and the Building 807 Launch Complex is on the west coast portion. (Map 2-3). The ridge that forms the spine of SNI is devoted, for the most part, to Sea Range instrumentation facilities of the Range Operations Department (NAVFACSW 2010a).

San Nicolas Islands' range support facilities include metric radars, telemetry antennas, receivers and transmitters, a frequency monitoring station, photo-optical tracking instrumentation, range communications facilities, microwave transmitters, missile launching pads, ordnance bunkers, surveillance radars, meteorological measurement systems, and target control facilities. Major Sea Range instrumentation facilities on the ridge are identified in Table 2-2. Not included in Table 2-2 are the many antennae associated with Sea Range communications.

2.1.3.2 San Nicolas Island Airfield and Waterfront Operations Facilities

Airfield Operations Facilities

Because of its isolated location, SNI relies on the airfield operations in order to accommodate daily living on the Island. The SNI airfield is owned, operated, and maintained by the Navy and consists of a single instrument-capable runway able to accommodate the largest military transport aircraft. The airfield and its supporting facilities are located at the southeastern end of the island's central plateau. The airfield consists of a control tower, hangars, lighting, ground control approach systems (Instrument Landing System [ILS]), and a fire station (NAVFACSW 2010a). The landing area of the airfield consists of a 10,000 foot (3,050 m) long, 200 foot wide (61 m), concrete and asphalt runway capable of accommodating C-5 aircraft. A 75 foot wide taxiway parallels the runway on the southwestern side of the airfield. Currently one air cargo flight per week delivers supplies to SNI (S. Schwartz, *pers. comm.*, 2010)



Map 2-3. Installation Radars, Alpha Launch Complex and 807 Launch Complex at San Nicolas Island.

Table 2-2. San Nicolas Island Sea Range Research, Development, Test, and Evaluation Facilities (SNI 2003).

Facility No.	Description
112	Radio Receiver Building
113	Radio Transmitter Building
127	Range Operations Building
127A	ITCS Radar Building
127B	ITCS Radar Building
138	APS-20 Radar Building (*Abandoned*)
148	Theodolite Station #24
162	Mobile Optical Tracking Unit 301 (*Abandoned*)
167	AN/FPS-16 Radar Building
169	AN/FPS-16 Radar Building
171	AN/FPS-16 Radar Building
173	Radar Building AN/FPS-16
174	Radar Boresight Tower
174A	Radar Boresight Tower
175	Radar Boresight Tower
175A	Radar Boresight Tower
176	ARSR-1 Radar Building
180	Test & Evaluation Storage
182	Telemetry Building
186	Frequency Control Tower
220B	TM Boresight Tower (100 FT)
220C	TM Boresight Tower (100 FT)
273	Sea Surface Surveillance Radar

Waterfront Operations Facilities

To support the PMSR and SNI infrastructure, bulk materials and supplies must be transported to the Island and waste materials must be removed. Currently, most materials and supplies are transported to SNI by supply barges. The barges are generally loaded at Port Hueneme, California and transported to SNI via tug boat. Port facilities in Long Beach, California have also been used to load barges for some specific projects in the past, but are not routinely used (S. Schwartz, *pers. comm.*, 2010). Approximately 30 to 40 barge operations are required annually; materials shipped include heavy equipment (missiles, targets, launchers, and military hardware), fuel trucks, bulk construction materials, and other items not feasibly transported via aircraft. Barge operations have been ongoing at SNI since 1943, with operations conducted at Daytona Beach since 1976 (NAWSCL 2002).

At present, fuel barges are moored offshore at Coast Guard Beach and off load their fuel to the fuel farm through piplelines on the seafloor (NAVFACSW 2010a). Water is also barged to the island, as needed, and water barges are moored offshore at Coast Guard Beach where they offload their water through supply hoses at the fuel farm mooring site (S. Schwartz, *pers. comm.*, 2010).

Barges transporting other provisions offload at the supply pier at the southeast side of SNI near Daytona Beach. The supply pier near Daytona Beach is equipped with an Open Ocean Roll-on, Roll-off Barge Landing Ramp (NAVFACSW 2010a). The supply pier and barge landing ramp are extremely important for the operations and support of SNI. Presently, barges do not land on the shore to offload (NAVFACSW 2010a).

2.1.4 Transportation and Utilities

2.1.4.1 Transportation

As mentioned previously, there are approximately 22 miles (35 km) of paved roads that generally run southeast to northwest along the long axis of the island. Monroe Drive, Beach Road, Jackson Highway, Shannon Road, and Tufts Road, Owen Road, and Skyline Drive are the primary named roadways. The circulation of traffic centers around three general areas: (1) the Community Support area and Public Works areas; (2) the airfield; and (3) Test and Evaluation infrastructure on the western half of the island. A secondary traffic focus is the Beach Road access to the supply pier and barge landing ramp on the southeast coast of the island (NAVFACSW 2010a).

All vehicles on the island are government-owned or controlled. Traffic conflicts only occur when convoys transport ordnance or other hazardous materials. Non-participating vehicles are precluded from operating along roads taken by these convoys while enroute. Parking is adequate at all areas. A bus services the Nicktown, PWD areas, and airfield areas several times each weekday (NOLF SNI 2003).

Personnel within the Community Support area or Public Works areas typically walk within that area to reach their destination. Sidewalks are present in bachelor housing courtyards at at the Community Support area; however, there are no connecting sidewalks along streets or between other facilities (NAVFACSW 2010a).

Transportation to and from SNI is nearly exclusively accomplished through scheduled contract passenger flights which bring duty personnel, researchers, or other permitted visitors to the island. A barge transports supplies and materials to the island weekly but is not utilized by personnel because of safety concerns and logistical considerations. Military personnel intermittently access the island using military aircraft, including helicopters and fixed wing aircraft, but visits are typically short in duration and related to specific military training operations.

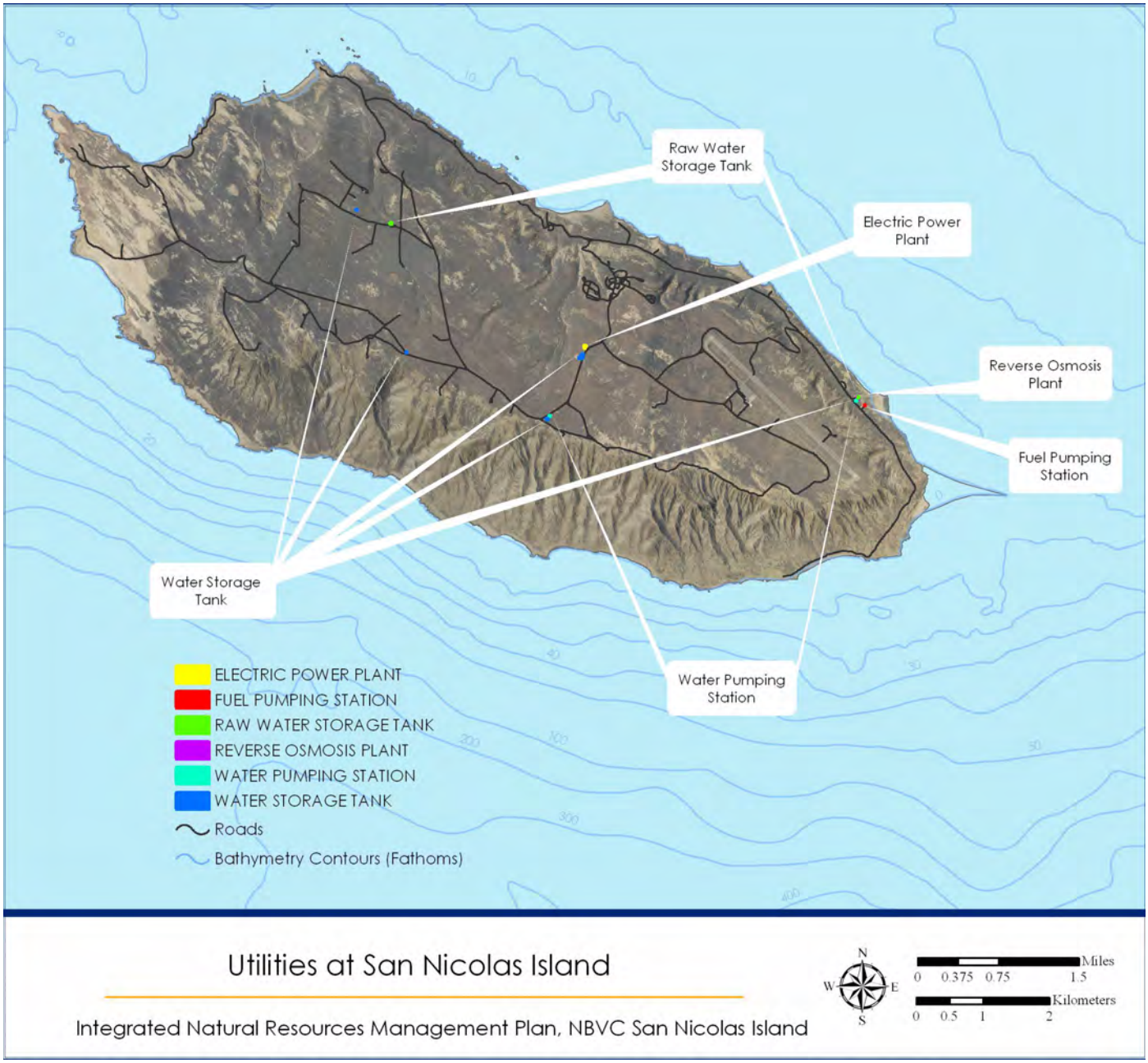
2.1.4.2 Utilities

Utilities infrastructure at SNI consist of an electrical distribution system, water distribution system, storm drainage system, sanitary sewer system, and communications system. All residential trash, recyclable materials, and industrial waste products are shipped off the island (S. Schwartz, *pers. comm.*, 2009). Utilities functions are confined to two primary locations at SNI. One is south of the Community Support Area near the intersection of Monroe Drive and Owen Road, and the second at the extreme northwestern end of the central plateau.

Facilities south of the Community Support area include the Electrical Power Plant (Building 114) and water storage tanks (NAVFACSW 2010a). Water storage tanks south of the Community Support area include 103 (inactive), 104, 200, 280 (inactive), and 282 (NAVFACSW 2010a). A Reverse Osmosis (RO) Plant located next to Coast Guard Beach supplies potable water to these active tanks where water is distributed to the Island. The sewage treatment plant and ponds are just north of this area.

Facilities at the northwestern end of SNI are primarily associated with the water supply system. They include Well Pump Houses 1 through 4, Facilities 131, 132, 133, and 134 (NAVFACSW 2010a). Additional facilities include Water Pumping House #1 (Facility 120) and a water storage tank. Directly north of this complex are several other water pumping stations, Facilities 161, 33, and 34 (NAVFACSW 2010a).

Other utilities such as septic drain fields are scattered about SNI. Map 2-4 shows the existing utility facilities on SNI.



Map 2-4. San Nicolas Island Utility Facilities.

There are minimal to no renewable energy utility facilities on SNI. The Navy funded the Department of Energy's National Renewable Energy Laboratory (NREL) to provide a plan to outline how SNI can transition into a renewable community and identify a current, energy, water, and waste baseline for SNI (NREL 2008). The NREL assessment findings indicate that on-site renewable energy systems could provide much of the islands energy requirements and that it may be cost effective to do so (NREL 2008). The NAVFACSW Energy Team has a proactive philosophy and has already undertaken innovative efforts to initiate the installation of wind energy on SNI (NREL 2008). For more information on the development of wind energy at SNI refer to *Section 2.1.4.2: Utilities*. For more information on future utility projects at SNI that incorporate sustainable planning and design principles refer to *Section 2.4: Future Use Patterns and Plans*.

Electrical Distribution System

The electricity used on SNI is generated by the Electrical Power Plant (Building 114) located south of the Community Support area. The Electrical Power Plant uses JP-5 jet fuel in five diesel generators to produce power for the Island (NREL 2008). This facility houses five, three-phase, 4160 volt (V) diesel generators with the following capacities: 825 kilowatts (kW), 910 kW, 1000 kW, and two at 1150 kW (NREL 2008; NAVFACSW 2010a). The average load ranges from 550 kW to 950 kW with a 150 kW to 200 kW peak (over the average) occurring morning, noon, and evening (NREL 2008). The total capacity, 5,150 kW meets the present peak demand of 1,050 kW (NAVFACSW 2010a). Fuel for the generators is stored in a 10,000-gallon (37,854-liter) above-ground tank to the south of Building 114 (NAVFACSW 2010a). The fuel tank is refilled by an underground pipeline. The fuel is barged to the Island and pumped up from the Fuel Farm at Coast Guard Beach to the airfield, then up to the Electrical Power Plant through an underground pipeline (NREL 2008). A 3,000-gallon (11,356-liter) lube oil tank is also located adjacent to Building 114. A pump allows transfer of oil to the engines as needed (NAVFACSW 2010a). The plant is also provided with an adjacent waste oil collection system. This system includes two 3,000-gallon (11,356-liter) holding tanks, two 500-gallon (1,893-liter) sump tanks, and two sump pumps (NAVFACSW 2010a).

The station auxiliary electrical equipment includes one 150 kilovolt-ampere (kVA), three-phase, 4160-120/208 V station service transformer, a 120/208V distribution panel board, a 125 V Direct Current (DC) station battery, and two 225 kVA, three-phase grounded-wye-delta-connected grounding transformers, one for each bus in the switch gear to provide a neutral for single-phase, 2400 V loads (NAVFACSW 2010a).

In addition to the 4160 V generators located in the Electrical Power Plant, critical loads in some buildings have back-up power from local emergency generators. The power is generated at utilization voltage (120/208 or 480 V) and is applied to the load through manual or automatic transfer switches (NAVFACSW 2010a).

Electricity is distributed throughout the island by three 4160 V feeders. Feeders #2 and #3 are mostly overhead. Feeder #2 serves the north-central area of SNI, including the personnel living, administration, recreational, and the PWD facilities. Part of Feeder #3 serves the air terminal and its associated hangars, as well as the maintenance facilities. The distribution, except for short sections, is on wood poles supporting bare copper conductors. The western half of the island is served mainly by Feeder #1, with a couple of loads served by Feeder #3. This part of the distribution to the western half of the Island is underground (NAVFACSW 2010a).

In order to support the transition to renewable energy at SNI, the Navy has proposed to construct up to 11 wind turbines at SNI (NAVFACSW 2010b). Energy generated by the wind turbines would serve to supplement energy demands on SNI that are currently met by the JP-5 fueled generators. Plans for the wind turbine project include up to 11 wind turbines, construction of an energy storage system, and underground utility conduit connections (NAVFACSW 2010b). The Environmental Assessment (EA) identifies conservation and construction measures to be implemented during the design, construction, and operation phases of the wind turbine project in order to avoid and/or minimize potential adverse impacts to natural resources including special-status plants and rare natural communities, common and rare wildlife, and other threatened and endangered species (NAVFACSW 2010b).

Water Distribution System

Fresh water is a limited resource on SNI and is a main concern for future growth. Water distribution is comprised of a network of storage tanks, pumps, mains, valves, and hydrants. Water is distributed from the main tanks to the different areas on SNI. Pressure reducing stations on the water mains serve the low elevation areas such as the Community Support area and the Public Works areas (NAVFACSW 2010). For these areas, the water pressure for building service is regulated to approximately 60 pounds per square inch gauge (psig) (NAVFACSW 2010). Water is pressurized for high elevation areas. Building 160 houses pumps that pressurize the water distribution system and water is pumped from tanks near Building 160 to serve the Jackson Hill area (NAVFACSW 2010).

The primary source of potable water on the Island is the water produced at the RO desalination plant installed in Building 50 at Coast Guard Beach. Two RO desalination units were installed in 2003 and the raw water source for the units is seawater, which is pumped from the beach. In January 2009, seven of the ten proposed wells were installed. Water is pumped from the well points to a seawater holding tank prior to treatment. The brine discharge (highly mineralized wastewater) from the RO unit is transferred to a secondary wastewater holding tank, which is located next to the seawater holding tank. When the wastewater tank is full, the brine is discharged to a brine pit located approximately 660 feet (200 m) from the RO unit along the upper beach where it disperses through the sand. The amount of brine discharge is monitored and limited by the Ocean Plan-Water Resources Board. The seawater desalination system discharges under an exception and permit into the SNI ASBS, with limitations, including flow limits (67,000 gallons [253,623 liters] per day). The ASBS exception was adopted by the SWRCB (Resolution 90-105) in 1990, and the most recent permit (NPDES No. CA0061794) was reissued by the Los Angeles Regional Water Quality Control Board (LARWQCB) in 2004 (Merkel and Associates Inc. 2007a). The Navy is in the preliminary stages of evaluating outfall designs in order to relocate the brine discharge outfall offshore.

Additionally, fresh water is delivered from off-island. A water barge can be moored near the RO desalination plant at Coast Guard Beach. The water is then off loaded through a submarine water line to a storage tank near Building 196. The second method is to deliver water tankers (trailers) on the freight barge that moors at the supply pier located at Daytona Beach. These two methods are very expensive and are used only as a last resort (NOLF SNI 2003).

Freshwater wells on the northwestern part of SNI are not a source of potable water but rather provide an as needed source of water for construction activities.

Storm Drainage System

SNI is required to comply with federal and state storm water regulations, in particular the National Pollution Discharge Elimination System (NPDES) General Industrial Activities Storm Water Permit and the California General Industrial Activities Storm Water Permit (general permit). The general permit regulates storm water associated with industrial activity and sets requirements to reduce pollutants in industrial storm water discharges. A Storm Water Pollution Prevention Plan (SWPPP) was revised in July 2010 and has been implemented for SNI (NBVC SNI 2010). The SWPPP was written in accordance with requirements of the SWRCB Water Quality Order No. 97-03-DWQ and NPDES General Permit No. CAS000001. The general permit authorizes SNI to discharge storm water from the date the Navy submitted a Notice of Intent (NOI) (17 March 1992). The SWPPP is intended to identify and evaluate potential sources of storm water pollutants and to specify Best Management Practices (BMPs) to control these sources and prevent or reduce pollutants in storm water discharges and authorized non-storm water discharges (NOLF SNI 2003; Merkel and Associates Inc. 2007a; NBVC SNI 2010). Please refer to *Section 5.9: Stormwater Management* for more information regarding this topic.

Sanitary Sewer System

The Community Support area and Public Works areas are serviced by a 40,000-gallon (151,416-liter) per day sanitary sewage treatment system (NAVFACSW 2010). Facilities at the airfield and on the remainder of the Island are served by individual septic tanks and drain fields (S. Schwartz, *pers. comm.*, 2010).

The sanitary sewer system components include gravity sewer lines, septic tanks and leach fields, and wastewater treatment facility (oxidation ponds). The wastewater treatment facility is located to the north and west of the Community Support area and consists of a series of three aerated stabilization ponds. Due to the large capacity of the stabilization ponds and the small population served by the plant, the primary method of wastewater disposal is by evaporation. The secondary method of disposal is by discharging the wastewater through irrigation. Treated wastewater is discharged via spray nozzles over a six-acre (2.4-ha) area of land which is restricted and off-limits to personnel. As required by its Waste Discharge Permit, the Navy is responsible for

reporting effluent discharge (amount and concentration of potential contaminants) for the SNI wastewater treatment facility (Merkel and Associates 2007a). The treatment facility must meet effluent discharge limitations and monitoring reports are submitted quarterly to meet the limitations set forth under the Waste Discharge Permit issued by the water quality control board (NAWCWD 2002).

Two septic tanks and leach fields dispose of the sewage generated by the facilities located at the airfield. Thirty-six septic tanks and leach fields serve the facilities in the outlying areas (SNI 2003). Septic and holding tank locations are necessary due to the size of the island and the remote locations of some of the buildings. The septic and holding tanks are inspected on a quarterly basis and pumped quarterly or as required. The majority of the outlying buildings are used infrequently or during a limited work day schedule; therefore, septic and holding tanks do not appear to pose a significant risk of contaminating the watershed areas.

Communications System

Communications throughout the island and to outlying areas is maintained through telephones, radios, pagers, and the internet. The backbone of communications on the Island is supported by two fiber optic telecommunication cables that run 65 miles (105 km) between NBVC Point Mugu and SNI (NAVFACSW 2010a). The fiber optic cable at SNI runs to Building 127 Range Communications (S. Schwartz, *pers. comm.*, 2010). Building 128, Telephone Exchange Building, houses the switchboard necessary for telephone communication (NAVFACSW 2010a). PWD personnel maintain contact with each other throughout the Island with hand-held radios and pagers. Internet access is available through Navy/Marine Corps Intranet (NMCI) or through a satellite link; dial up internet access is not used at SNI (S. Schwartz, *pers. comm.*, 2010).

2.2 Other Land Uses

2.2.1 Landscaping and Grounds

Landscaping and grounds keeping work occurs within the Community Support area at SNI. Watering is not included as part of landscaping and grounds maintenance efforts (S. Schwartz, *pers. comm.*, 2009). It is anticipated that future native plant landscaping will be developed to accompany facility renovations and improvement around the Community Support Area. Future landscaping at SNI will follow the guidance set forth in the San Nicolas Island Landscaping Plant List.

The purpose of the San Nicolas Island Landscaping Plant List is to provide a clear set of approved plants that are not known to be invasive to the island. All plant selections (outdoor landscape or indoor plants) for SNI must be approved by appropriate staff in NBVC Environmental Division. Specifically, landscape designs and plant lists shall be reviewed and approved by the Installation Natural Resource Specialist and the NAVFAC Landscape Architect in the planning stages of project design.

It is vital that coordination with the Installation Natural Resource Specialist and the NAVFAC Landscape Architect occur early in the planning process to determine site-specific needs and constraints. Please note that not all species on this list are appropriate for all settings. For example, in some areas trees may not be approved due to Bird/Animal Aircraft Strike Hazard (BASH) risks and/or the presence of federally listed species. Additional native species may be included in the landscape design contingent upon the approval of the Installation Natural Resource Specialist and the NAVFAC Landscape Architect. All plants shall be verified for availability in size and quantities needed for each project prior to specifying on plans or scopes of work. This San Nicolas Island Landscaping Plant List is updated periodically. Prior to initiating a project, please obtain the most recent list from the Installation Natural Resource Specialist.

For more information on Landscaping and Grounds maintenance refer to *Section 5.14: Landscaping and Grounds Maintenance*. The San Nicolas Island Landscaping Plant List is included in this INRMP as Appendix F.

2.2.2 Leases

The Navy owns and operates SNI and does not lease any areas of the island to outside entities.

2.2.3 Installation Restoration Sites

There are no active Installation Restoration Program (IRP) sites located on SNI. Per OPNAVINST 5090.1C, Navy policy relative to IRP sites requires every effort must be made to ensure that Navy projects are not constructed on contaminated sites. If contamination is discovered during the planning stages of a project or during construction, careful project controls must be in place to ensure proper investigation and clean-up procedures are followed (NOLF SNI 2003).

Although there are no active IRP sites, there are various petroleum products and hazardous materials that are currently used to support aircraft and vehicle maintenance that are performed on the Island.

Jet fuel (JP-5) and unleaded gasoline are the petroleum products that are stored in bulk at SNI (NOLF SNI 2006b). About 680,000 gallons (2.6 million liters) of jet fuel are shipped to the island by tanker barge every year (NAWCWD 2002). Unleaded gasoline is also shipped for use by ground vehicles in 15,000-gallon (56,781-liter) tanker trucks as needed (S. Schwartz, *pers. comm.*, 2010).

Propane (average 1,000 gallons [3,785 liters] or 1,300 pounds [590 kg]) and liquid oxygen (minimal - as needed) are the hazardous substances that are stored in bulk at SNI (NOLF SNI 2006b). Only the minimum amount of a hazardous material is obtained for a task order to prevent disposing excess material as hazardous waste (NAWCWD 2002). An inventory of hazardous substances is maintained by each activity storing or using the particular hazardous substance at SNI (NOLF SNI 2006b). In addition, the Public Works Environmental Division maintains an inventory of hazardous substances used at SNI. The inventory is updated annually and provided to the County of Ventura Department of Environmental Health for areas that could be affected by a release (NOLF SNI 2006b). None of the substances are considered to be Extremely Hazardous Substances. Site-specific spill response plans have been developed for each storage location that would require the highest levels of personnel protection in the event of a release (NOLF SNI 2006b). For more information on the Oil and Hazardous Substance Spill Prevention Response Integrated Contingency Plan refer to *Section 2.3: Oil Spill Response and Natural Resources Damage Assessment*.

2.2.4 Recreation and Public Access

2.2.4.1 Recreation for SNI Personnel at SNI Onshore Areas

Recreational facilities are predominantly located in the Community Support area and include a Ship Store and theater, the Islander Club, indoor fitness facilities, hobby shop, and Chapel (NAVFACSW 2010a). Building 151 offers a Ship Store and a theater for showing movies and plays. The “Islander Club”, Building 25, is operated by Morale, Welfare, and Recreation (MWR) and provides a social atmosphere for Island personnel with several arcade games, pool tables, a jukebox, an outdoor patio, a bar and small kitchen and restaurant. Indoor fitness facilities located in the Community Support area include an indoor racquetball court, indoor volleyball/basketball court, gymnasium, fitness center, and indoor pool (NAVFACSW 2010a). The indoor racquetball court is located in Building 75 and the indoor volleyball/basketball court is located in Building 154. The gymnasium is located in Building 215 and the MWR also operates a gear issue facility at that location. The fitness center, Building 218, is located on the eastern side of the Community Support area and was recently renovated so that it is now in adequate condition. The indoor pool is located in Building 220 and the hobby shop is located in Building 74. Chapel is also present at SNI and is located in Building 109.

The Bowling Alley, Building 10, is the only indoor recreational facility located in the Public Works areas outside of the Community Support area (NAVFACSW 2010a). Outdoor recreational facilities in the community support area include a baseball field and tennis court (NOLF SNI 2003). Table 2-3 identifies the indoor and outdoor recreational facilities available for use by SNI personnel.

Table 2-3. San Nicolas Island Recreational Facilities (NOLF SNI 2003; NAVFACSW 2010a).

Facility No.	Description
10	Bowling Alley
25	Islander Club
74	Hobby Shop
75	Indoor Racquetball Court
109	Chapel
151	Ship Store/Theater
154	Indoor Volleyball/Basketball Court
215	Gymnasium
218	Fitness Center
220	Indoor Pool
N/A	Baseball Field
N/A	Tennis Court

The two categories of outdoor recreation opportunities recognized for Island personnel are concentrated area activities and dispersed area activities.

Concentrated Outdoor Recreation Areas and Activities - Cissy Cove, Corral Harbor, and Daytona Beach are popular sites for outdoor recreational pursuits (NAVFACSW 2010a). Personal watercraft to be used for recreational fishing are launched from Cissy Cove. Corral Harbor is favored for snorkeling and diving. Daytona Beach is the popular fishing spot. Surfing, boat use, and recreational diving are all popular activities on the Island. All of these activities have been restricted to specific areas on the Island to preserve natural and cultural resources and ecologically sensitive areas (NAVFACSW 2010a).

Dispersed Outdoor Recreation and Activities - Fishing is probably the most popular dispersed recreational activity on SNI. The Island is surrounded by lush kelp forests, exhibits an upwelling of nutrient, and has numerous fishing spots along the shoreline. Many of the better areas to fish are identified by fishing signs (NAVFACSW 2010a). Some of the more common species include cabezon, California sheephead, rock bass, white bass, and calico bass. Fishermen must have a California ocean-fishing license to fish on SNI and abide by bag and size limits. The CDFG is responsible for the enforcement of fishing regulations on the Island, although among the small SNI community, peer pressure to abide by the rules and regulations appears to foster self-regulation of fishing laws (NAVFACSW 2010a). Fishermen must also abide by SNI area closures due to environmental laws protecting certain wildlife and respect cultural resources areas, such as Native American middens located near coastal areas. Environmental personnel post flyers regarding fishing on SNI, including specific information on different species of fish and catch limits, in obvious locations (NAVFACSW 2010a).

2.2.4.2 Public Access and Recreational Use of SNI Offshore Areas

Public recreational activities occur exclusively in nearshore areas of SNI, particularly in areas adjacent to shore less than 300 feet. Common offshore recreational activities include sport fishing, Self Contained Underwater Breathing Apparatus (SCUBA) diving, boating, and occasionally surfing.

Southern California is a leading recreational fishing area along the west coast but variable weather and sea conditions at SNI allow for challenging conditions at times. The coastline around SNI support robust kelp forests that provide optimal sport fishing opportunities, although exposure to prevailing winds and waves limit accessibility during much of the year. Commercial passenger fishing vessels intermittently offer one to two day sport fishing excursions either from the Ventura or Port Hueneme har-

bor. SCUBA diving at SNI takes place on occasion and is most common in conjunction with the beginning of lobster season (Saturday preceeding the first Wednesday in October). Offshore recreational activities are generally allowed around SNI, during periods of limited military activity. Restrictions are enacted to clear the appropriate Sea Range operational areas of non-participants before military operations are conducted (NAWCWD 2002). Refer to *Section 2.1.2.5: Safety Analyses and Planning* for more information regarding Sea Range clearance procedures.

2.2.4.3 Public Access and Commercial Use of SNI Offshore Areas

Commercial fishing occurs in the nearshore and open ocean waters within 30 miles of SNI and fishing vessels participating in these fisheries regularly use SNI anchorages while fishing on multi-day trips. Most types of fisheries common in southern California can occur in the nearshore waters of SNI. The top five commercial fisheries (by pounds landed) between 1998 and 2002 were: Urchin, Cucumber, Squid, Lobster, Sheephead respectively (J. Ugoretz, *pers. comm.*, 2009). The primary nearshore fisheries at the island remain sea urchins and lobster (abalone fisheries are currently closed). These fisheries occur in less than 120 feet (37 m) of water around the island; fall and winter are the most heavily utilized seasons for these fisheries. Fisheries seasons and regulations are established and regulated by the CDFG.

2.2.4.4 Public Access and Use of SNI Onshore Areas

Unauthorized public access onshore at SNI is prohibited, primarily due to security and safety requirements associated with the island's weapons testing mission and associated equipment.

USDODDIR 4715.3, Environmental Conservation Program, 03 May 1996, states,

"The principal purpose of USDOD lands and waters is to support mission-related activities. Those lands and waters shall be made available to the public for educational or recreational use of natural and cultural resources when such access is compatible with military mission activities, ecosystem sustainability, and other considerations such as security, safety, and fiscal soundness. Opportunities for such access shall be equitably and impartially allocated."

2.3 Oil Spill Response and Natural Resources Damage Assessment

SNI's storage and transfer operations have the potential for a discharge of oil onto land or into navigable waters that could cause substantial harm to the environment, including injury to fish and wildlife and sensitive areas. Operational efficiency and safety of personnel and equipment, as well as Federal, State, and Navy regulations require that a plan exist to effectively respond to oil and hazardous substance spills. Oil and hazardous substance spill prevention and response planning requirements include the National Contingency Plan (NCP), Area Contingency Plan (ACP), Spill Prevention Control and Countermeasure (SPCC) Plan, Federal Facility Response Plans (FRPs), State of California Oil Spill Contingency Plan, U.S. Navy Instructions, Additional Emergency Response Planning, and an Integrated Contingency Plan (ICP).

The National Contingency Plan . The CWA and the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980, as amended, required that Federal agencies make plans for emergency response to spills of oil and hazardous substances for which they are responsible. To comply with these Acts, the Environmental Protection Agency (EPA) has published Title 40 CFR Part 300, The National Oil and Hazardous Substances Pollution Contingency Plan, commonly referred to as the National Contingency Plan or NCP (NOLF SNI 2006b). The Final Rule for 40 CFR Part 300 was published on 15 August 1994 with an effective date of 17 October 1994.

Area Contingency Plan . The Oil Pollution Act of 1990 and EO 12777 require that *Area Spill Contingency Plans* be developed in accordance with the National Response Policy. The policy also requires that a pre-designated Federal On-Scene Coordinator (FOSC) be assigned to ensure effective and immediate removal of a discharge of oil or hazardous substances (NOLF SNI 2006b). The United States Coast Guard (USCG) designates FOSCs for the coastal zone of the U.S., and the EPA designates FOSCs for the inland zone. The Captain of the Port (COTP), Los Angeles-Long Beach, has been pre-designated to carry out the duties of the FOSC for the coastal areas of Southern California between San Louis Obispo and Orange County. San Nicolas Island operates within the guidelines of the USCG, EPA, and the State of California under the Los Angeles/Long Beach ACP published in January 2000 (NOLF SNI 2006b).

Spill Prevention Control and Countermeasure Plan . The EPA's Oil Pollution Prevention Regulations address non-transportation related facilities. Title 40 CFR Part 112 requires facilities to have a fully prepared and implemented SPCC Plan. These plans are to establish spill prevention procedures, methods, and equipment requirements for non-transportation related facilities with: (1) total aboveground, non-buried, oil storage capacity greater than 1,320 gallons (5,000 liters), including only those containers of oil 55 gallons (208 liters) or greater; or (2) underground, buried, oil storage capacity greater than 42,000 gallons (160,000 liters) (NOLF SNI 2006b). Facilities meeting these criteria and because of their location, that could reasonably be expected to discharge oil into navigable waters of the United States or adjoining shorelines, require SPCC plans (NOLF SNI 2006b). Based on these criteria and operations, SNI must have a SPCC Plan.

Federal Facility Response Plans . In response to the Oil Pollution Act of 1990, the EPA issued revised rules in 40 CFR Part 112, Oil Pollution Prevention and Response; Non-Transportation-Related Facilities. The Final Rules require a FRP be prepared and submitted to the EPA Regional Administrator for any non-transportation-related facility that could reasonably be expected to cause substantial harm to the environment should a spill occur (NOLF SNI 2006b). The FRP requirements in the EPA Final Rules apply to SNI because it transfers oil over water and has an oil storage capacity greater than 42,000 gallons (160,000 liters) and a discharge could be expected to cause substantial harm to fish and wildlife and sensitive environments on or around the facility (NOLF SNI 2006b). SNI is also classified as a Marine Transportation-Related (MTR) facility because it is capable of transferring oil to or from a vessel with a capacity of 250 barrels or more and it could be expected to cause significant and substantial harm to the environment by discharging oil into or on the navigable waters, adjoining shorelines, or exclusive economic zone of the United States (NOLF SNI 2006b). Therefore, the Final Rule issued by the USCG rules in 33 CFR Part 154, Facilities Transferring Oil or Hazardous Material in Bulk, applies to SNI and a response plan must be prepared to meet these requirements (NOLF SNI 2006b).

State of California Oil Spill Contingency Plan . Title 14 of the California Code of Regulations gave the Office of Oil Spill Prevention and Response (OSPR) authority to require marine facilities to submit oil spill contingency plans. San Nicolas Island must prepare and submit a contingency plan consistent with these requirements. The SNI ICP has been prepared to include requirements of the State of California and Title 14 CCR, Section 817 and Title 2 CCR, Division 3, Chapter 1, Article 5 regulations concerning Oil Spill Contingency Plans and Marine Facility Operations Manuals (NOLF SNI 2006b). The SNI Emergency Response Action Plan, also known as The Red Plan, provides the information for and serves as a Response Manual (NOLF SNI 2006a). Additional specific response information and procedures can be found in the various Annexes of the SNI Oil and Hazardous Substance Integrated Contingency Plan. In addition, Title 2 CCR, Division 3, Chapter 1, Article 5 requires an Operations Manual for the mooring where fuel is transferred at SNI. The Operations and Maintenance Manual, Final Revision 2, for Naval Base Ventura County was prepared to address this planning requirement (NOLF SNI 2006b). The Operations and Maintenance Manual, Final Revision 2, for NVBC was submitted to the US Coast Guard and State of California and approved on 26 July 2005.

U.S. Navy Instructions . Government facilities must ensure compliance with the Oil Pollution Act of 1990 and Federal regulations in response to EO 12088 (compliance with applicable pollution control standards, 1978) and 12856 (planning, Emergency Planning and Community Right-to-Know Act [EPCRA], and pollution prevention requirements, 1991). San Nicolas Island is owned and operated by the U.S. Navy. In accordance with the OPNAVINST 5090.1C series (*Environmental Protection and Natural Resources Manual*), Naval facilities will pursue the protection and enhancement of the quality of the environment by adhering to all applicable regulatory requirements (NOLF SNI 2006b). Facility Response Plans and SPCC Plans will be properly developed, submitted, and maintained by each installation required to do so. Any State requirements will also be met in facility response planning. San Nicolas Island is also expected to address Spill Contingency Planning as part of the Regional Environmental Coordinators Disaster Preparedness Plan for their geographical areas of responsibility (NOLF SNI 2006b). San Nicolas Island complies with the requirements in these Instructions.

Additional Emergency Response Planning . Facilities that handle or store hazardous substances, the release of which could endanger health and human safety and adversely impact the environment, must comply with additional Federal regulations that govern emergency planning, notification, and response. These requirements are part of the Resource Conservation and Recovery Act (RCRA), CERCLA, and EPCRA regulations contained in 40 CFR Part 264, 40 CFR Part 302, and 40 CFR Part 355, respectively. The Occupational Safety and Health Administration (OSHA) also has regulations governing emergency response and planning. Applicable requirements contained in 29 CFR Part 1910 are addressed in the SNI Oil and Hazardous Substance ICP (NOLF SNI 2006b).

Integrated Contingency Plan . On 05 June 1996, the National Response Team (NRT) issued a Federal Register Notice on ICP Guidance (NOLF SNI 2006b). It intended to provide a mechanism for consolidating multiple plans that facilities prepare to comply with various regulations into one functional emergency response plan or ICP. The SNI Oil and Hazardous Substance ICP was prepared to meet all requirements as an ICP, as defined by the NRT (NOLF SNI 2006b). Specifically, the NOLF SNI ICP for Oil and Hazardous Substance Spill Prevention and Response is an operational, single-source document designed to meet the combined regulatory requirements for an EPA FRP, and EPA SPCC Plan, a USCG Response Plan for Oil Facilities (MTR FRP), and a State of California OSPR Oil Spill Contingency Plan. The NOLF SNI ICP for Oil and Hazardous Substance Spill Prevention and Response also addresses the emergency planning, notification, and response actions directed by the RCRA, CERCLA, EPCRA, and OSHA. The NOLF SNI ICP for Oil and Hazardous Substance Spill Prevention and Response is also consistent with the NCP and the Los Angeles/Long Beach ACP.

In the event of an oil or a hazardous substance spill at SNI, the Emergency Response Action Plan, also known as the “The Red Plan,” serves as the initial plan to get the right response actions on track at the earliest possible time. The NOLF SNI ICP for Oil and Hazardous Substance Spill Prevention and Response reinforces “The Red Plan” and provides in-depth information on response, notification, organization, duties, containment, cleanup, and remediation procedures (NOLF SNI 2006b). The organizations to be involved in a spill response at SNI are identified in Figure 2-1.

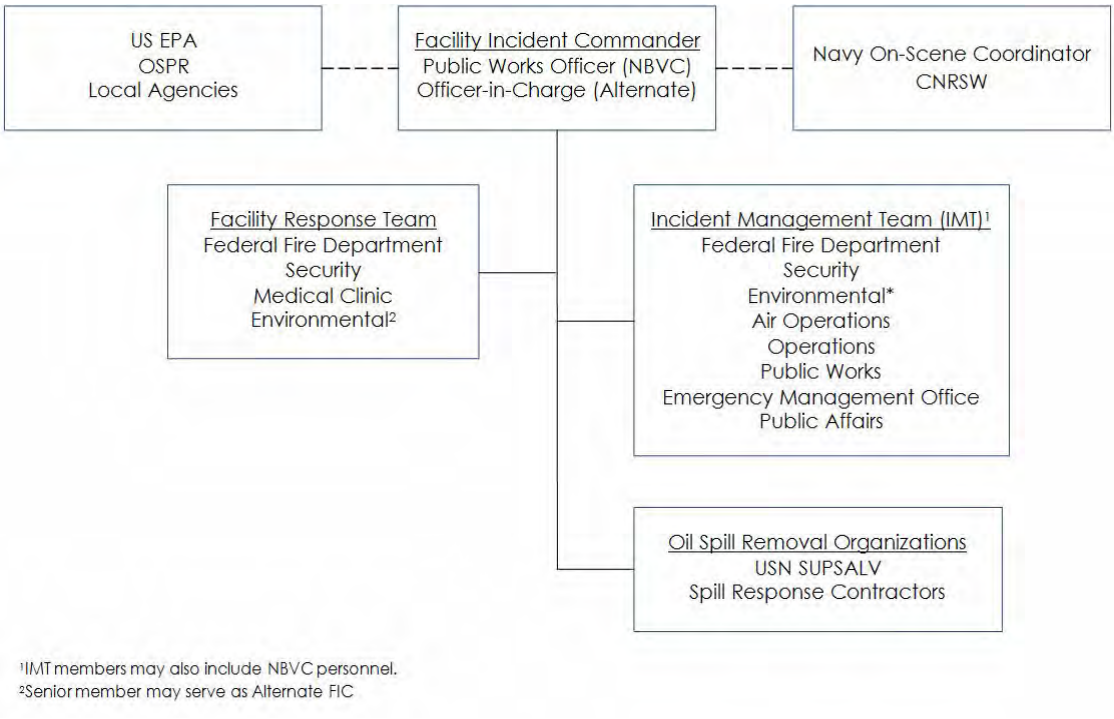


Figure 2-1. San Nicolas Island organization for spill response (NOLF SNI 2006a).

"*The Red Plan*" is used in the early stages of a spill, and incident responders are expected to transition to the ICP for Oil and Hazardous Substance Spill Prevention and Response after appropriate notifications and response actions are underway.

Natural Resource program staff at SNI has coordinated with USCG and their partners in meetings and has provided geographic information system (GIS) layers of SNI's sensitive coastal areas during the revision of the *Los Angeles/Long Beach Area Contingency Plan* (M. Ruane, *pers. comm.*, 2010). Natural Resource Program staff will continue to provide current and updated information for inclusion into the *Los Angeles/Long Beach Area Contingency Plan.*

2.4 Future Use Patterns and Plans

SNI Future Range Operations

Future operations at the Sea Range and at SNI may include new facilities and target launch systems to support the following additional theater missile defense activities: (1) boots phase intercept; (2) upper tier; (3) lower tier; and (4) nearshore intercept events (NAWCWD 2002).

As part of future range operations and SNI facility modernizations, a vertical launch system would be constructed at one of the pads at the Building 807 Launch Complex on the west end of the island. A land-based vertical launch capability is useful for missile testing and training events because it effectively simulates a realistic shipboard launch scenario without the logistics of launching from a ship on the Sea Range. The launcher would be placed on a previously graded area which is devoid of vegetation. The sighting criteria for this facility includes an onshore location near sea level which is logistically feasible (i.e. missiles can be transported safely to and from the site, and there is an adequate safety buffer zone around the site) (NAWCWD 2002).

Strategically located multi-purpose instrumentation sites would also be constructed in support of future range operations and SNI facility modernization (NAWCWD 2002). These facilities would increase NAWCWD capabilities through the use of mobile instrumentation and would also increase opportunities for resource sharing. Examples of mobile instrumentation, which could be used at the proposed sites include portable communications vans, portable optics stations, and portable tracking systems (NAWCWD 2002). Specifically, NAVAIR has plans and approval to construct a new laser test site and construction is anticipated to begin on that project in 2010 (S. Schwartz, *pers. comm.*, 2010).

SNI Activity Overview Plan and Sustainable Planning and Design

The SNI Activity Overview Plan identified a preferred vision to construct facilities in support of new and expanded mission requirements, create more community support to meet facility requirements, eliminate duplication, and reduce infrastructure costs (NAVFACSW 2010a). The preferred vision as identified in the Activity Overview Plan is based on the principles of sustainable planning and design and will provide ideal functional relationships to increase operational capacity, promote proper circulation, provide adequate levels of community support, and improve land use efficiencies (NAVFACSW 2010a). The preferred vision in the Activity Overview Plan describes the SNI 25 year vision for land and facility use and presents an implementation strategy for meeting short-term, mid-term, and long-term planning actions.

Short-term planning actions are those that will occur within a five year period. These actions consist of high priority construction to meet immediate deficiencies, resuse of facilities with minor to no modification, conversion of Navy owned land into training ranges, leased facilities, and minor construction with few development constraints (NAVFACSW 2010a).

Mid-term planning actions are those that will occur between a 5 to 10 year time period, and consists of projects that typically require a series of actions. Those actions at SNI include projects that must be processed through the Installation Integrated Priority List (IPL) and actions predicated on prior planning actions such as facility demolitions or user relocation (NAVFACSW 2010a).

Long-term planning actions occur beyond the 10 year time frame, but as they relate to the Activity Overview Plan, are to be implemented by 2030. Long-term planned projects are those that are lower on an installation's IPL than other similar projects, are predicated on facilities exceeding their life expectancy prior to 2030, have significant costs precluding mid-term implementation, or are dependent on the implementation of mid-term actions (NAVFACSW 2010a).

The projects recommended for implementation in the Activity Overview Plan are identified in Table 2-4. Each of these recommended projects are cross-referenced to a project number as identified in the Activity Overview Plan and utilize existing land use designations as designated by category code numbers (CCNs) (NAVFACSW 2010a). Unified Facilities Criteria (UFC) 2-000-05N defines CCNs to provide a common planning standard and identify facility uses in a consistent method. The CCNs used to describe land uses at SNI include:

- 100 Series - Operations (Airfield, Waterfront, Communications, and Training)
- 200 Series - Maintenance (Public Works)
- 300 Series - RDAT&E
- 400 Series - Supply and Storage
- 500 Series - Medical/Dental
- 600 Series - Administration
- 700 Series - Community Support
- 800 Series - Utilities and Circulation

These recommended projects are all based on the principles of sustainable planning and design (NAVFACSW 2010a). Sustainable planning and design is the practice of implementing strategies for buildings and landscapes that protect the environment, reduce life cycle costs and improve the quality of living conditions. Protection of the environment includes the use of recycled and environmentally friendly materials, man-

aging stormwater through the strategy of Low Impact Development (LID) and limiting the impact of atmospheric emissions. Operating costs can be lowered by reducing the energy use through high performance building systems, employing renewable energy sources, optimizing solar orientation and reducing the amount of materials and man hours required for maintenance. Providing good ventilation, natural task lighting and avoiding items that emit chemicals can optimize living conditions (NAVFACSW 2010a).

One of the recommended projects identified in Table 2-4 that has been assessed for environmental impacts through a NEPA assessment and that is planned for short-term implementation is the project to develop wind energy facilities on SNI (NAVFACSW 2010b). This project would utilize wind turbines to generate power and connect to the power grid system (NAVFACSW 2010a; NAVFACSW 2010b). The utilization of wind turbines on SNI will greatly reduce the quantities of JP-5 jet fuel utilized on the island. All wind turbines will be constructed along Skyline Drive and will provide approximately 900 kW of wind power and battery storage (NAVFACSW 2010; NAVFACSW 2010b).

In addition to pursuing renewable energy sources at SNI, the Navy has also adopted the strategy to construct more sustainable facilities, and has a target of Leadership in Energy and Environmental Design (LEED) rating Silver (NAVFACSW 2010a). The U.S. Green Building Council (USGBC) has developed this rating system to "… provide a framework for assessing building performance and attaining sustainability goals." Refer to the LEED guidelines on the Whole Building Design Guide (WBDG) web site[1]. Other sustainability issues include LID, which is a stormwater management strategy employing a variety of natural and built features to reduce water pollution. Refer to UFC 3-210-10-LID for more information. Runoff should be contained on-site and resused whenever feasible. Dry conditions and poor soil structure on SNI allow intense erosion to occur during storm events (NAVFACSW 2010a). Capturing this runoff prior to contact with the drainage channels will diminish the need to import water, minimize the degradation of stabilized slopes, and potentially prevent the undercutting of infrastructure (NAVFACSW 2010a). For more information on implementing sustainability principles at SNI refer to *Section 5: Sustainability and Compatible Use at San Nicolas Island*.

1. Whole Building Design Guide website: http://www.WBDG.org.

Table 2-4. Activity Overview Plan Recommended Projects for Implementation (NAVFACSW 2010a) .

Mission Element	Land Use	Project #	Issue of Concern	Resolution	Primary CCN	Implementation Time Frame
Mission Critical	Airfield Operations	ST 09-06	Airfield Pavement and Erosion	Repair Runway pavement and Provide Drainage Collection System	111-10	Short-Term
Mission Critical	Airfield Operations	SNI-01	Air Surveillance Radar (ASR) Deficit	Construct Air Surveillance Radar (ASR) Facility	133-75	Short-Term
Mission Critical	Airfield Operations	SNI-02	Precision Approach Radar Deficit	Construct Precision Approach Radar	134-41	Short-Term
Mission Critical	Airfield Operations	P-106	Air Operations, Control Tower, Ground Control Approach Crew Facility, and Security Deficits/Dilapidation	Consolidated Airfield Facility	134-41	Short-Term
Mission Critical	RDAT&E	SNI-03	Telemetry Building Deficit	Construct a new Telemetry Building	131-25	Long-Term
Mission Critical	RDAT&E	SNI-04	Range Operations Center Facilities	Consolidate Range Operations	310-23	Mid-Term
Mission Critical	RDAT&E	SNI-05	Range Operations Center Facilities	Consolidate Range Operations and Re-use Existing Facilities	310-23	Short-Term
Mission Critical	RDAT&E	SNI-06	Biological and Archeology Lab Relocation	Relocate Biological and Archeology Lab	310-25	Mid-Term
Mission Critical	Waterfront Operations	SNI-07	Stacking and Loading of Materials on and off the Barge	Install a Loading Ramp	851-15	Short-Term
Mission Critical	Waterfront Operations	SN9-813	Landing Craft Ramp and Boat Shop Deficit	Construct Cissy Cove Boat Launch	159-66 & 213-58	Short-Term
Mission Support	Circulation	SNI-08	Deteriorated Roadways	Phased Roadway Repairs	851-10	Short-Term, On-going
Mission Support	Communication	SNI-09	Telephone Exchange Building Deficit	Expand Telephone Exchange Building and Provide Drainage	131-40	Mid-Term
Mission Support	General Maintenance	SNI-10	Aging Public Works Facility	Construct New Public Works Facility	219-10	Mid-Term
Mission Support	Public Safety	P-154	Structural Fire and Aircraft Crash Rescue Inadequate Facilities	Combined Structural Fire and Rescue Station	141-25	Short-Term
Mission Support	Supply	SNI-11	CESE Operational Storage Deficit	Relocate CESE Operational Storage to Building 1003	143-77	TBD
Mission Support	Supply	P-560	Hazardous and Flammable Storehouse Deficit	Hazardous and Flammable Storehouse	441-30	Short-Term
Mission Support	Utilities	SNI-12	Power source at isolated areas	Provide solar power	N/A	Short-Term
Mission Support	Utilities	SNI-13	Power Upgrades Needed	Connect Power Grid with Redundancy	812-32	Mid-Term
Mission Support	Utilities	SNI-14	Sustainable Power	Provide Wind Turbines	N/A	Short-Term
Mission Support	Utilities	SNI-15	Brine Discharge, Water Capacity, and System Monitoring	Disposal System, Construct RO Unit, and Provide Water Utility Supervisory Control and Data Acquisition (SCADA) system for monitoring and control	841-10	Mid-Term
Mission Support	Utilities	SNI-16	Water Shortage and Fire Flow	Construct Water Storage Tanks	841-10 & 841-40	Mid-Term
Mission Support	Weapons	SNI-17	EOD Operational Storage and Administration Deficit	Relocate EOD	143-77	Short-Term
Mission Support	Weapons	SNI-18	Missile Assembly and Test Building Deficit	Construct Missile Assembly and Test Building	212-30	Short-Term
Mission Support	Weapons	SNI-19	Ordnance Storage Deficit	Construct a Missile Storage Magazine	421-72	Short-Term

Table 2-4. Activity Overview Plan Recommended Projects for Implementation (NAVFACSW 2010a) (Continued).

Mission Element	Land Use	Project #	Issue of Concern	Resolution	Primary CCN	Implementation Time Frame
Quality of Life	Bachelor Housing	SNI-20	Poor Quality Housing	Renovate Bachelor Housing and Visitors Quarters	721-12, 724-11, 721-33, and 740-22	Mid-Term
Quality of LIfe	Bachelor Housing	RM6-05	Civilian Quarters - GS07 and Above Deficit	Renovate Existing Civilian Quarters	724-22	Mid-Term
Quality of Life	Bachelor Housing	P-557	Civilian Quarters - GS07 and Above Deficit	Construct New Civilian Quarters	724-22	Mid-Term
Quality of Life	Bachelor Housing	SNI-21	Transient Berthing Deficiency	Provide Concrete Pads for Temporary Trailers	721-21	Short-Term
Quality of Life	Community Support	SNI-22	Bowling Center Proximity to Users	Construct Bowling Center	740-40	Short-Term
Quality of Life	Community Support	SNI-23	Inadequate Gymnasium	Construct New Gymnasium	740-44	Short-Term
Quality of Life	Community Support	SNI-24	Recreation Center Deficit	Construct Recreation Center	740-54	Mid-Term
Quality of Life	Recreation	SNI-25	Outdoor Playing Court Deficit	Construct Outdoor Playing Courts	750-10	Mid-Term
Quality of Life	Recreation	SNI-26	Playing Field Dilapidation	Construct Playing Field	750-20	Mid-Term
Quality of Life	Recreation	SNI-27	Recreational Ground Deficit	Construct Recreational Grounds	750-57	Mid-Term
Quality of Life	Recreation, Community Support, Housing	SNI-28	Lack of Pedestrian Wayfinding	Develop Pedestrian Wayfinding Plan for Community Support Area	852-20	Short-Term

2.5 Overview of Government Regulatory Context and Jurisdictions of Natural Resources Management

2.5.1 Summary of Planning Jurisdictions

For projects and federal activities within SNI waters Figure 2-2 depicts the key jurisdictions and the underlying laws pertaining to each, since the location can trigger different regulations based on the tidal elevations in which the footprint of the project occurs. Location, based on tide level such as mean higher high water, is important in identifying which agencies become involved in project review. The tidal elevations for SNI are specific to the island. See Table 2-5.

Table 2-5. San Nicolas Island 2010 tidal elevations.

Tide	Elevation (ft.)
Mean High Water, Spring	3.97
Mean Higher High Water	4.79
Mean High Water	4.14
Mean Sea Level	2.50
Mean Low Water	0.91
Mean Lower Low Water	0.08
Mean Low Water, Spring	0.75

State Tidelands Submerged Lands

Coastal states are given ownership of lands and resources within 3 nm (6 km) of mean high tide line. State control and regulation of the development of resources such as oil and gas, and fisheries, in state waters was confirmed by the Federal Submerged Lands Act of 1953.

Outer Continental Shelf

The Outer Continental Shelf Lands Act of 1953 confirmed federal jurisdiction over the resources beyond 3 nm (6 km) from shore.

Territorial Seas

Pursuant to a 1988 presidential proclamation, the U.S. asserts sovereign rights over the lands and waters out to 12 nm (22 km) from shore. The rights of the states out to 3 nm (6 km) from shore are not disturbed by this proclamation.

Exclusive Economic Zone

Pursuant to a 1983 presidential proclamation, the U.S. asserts jurisdiction over the living and non-living resources from 3-200 nm (6-370 km) offshore. The Coastal Zone Management Act, which provides for the California Coastal Commission (CCC), gives coastal states substantial authority to influence federal actions beyond 3 nm (6 km) from shore. (An example germane to SNI is the CCC's influence in the handling of offshore oil and gas leases in federal waters of the SCB).

Contiguous Zone

From 12 to 24 nm (22-44 km) offshore, the U.S. can exercise control over customs, fiscal, immigration, and sanitary matters.

High Seas

Beyond 12 nm (22 km) from shore, the U.S. maintains the right to freely navigate its vessels (including war vessels).

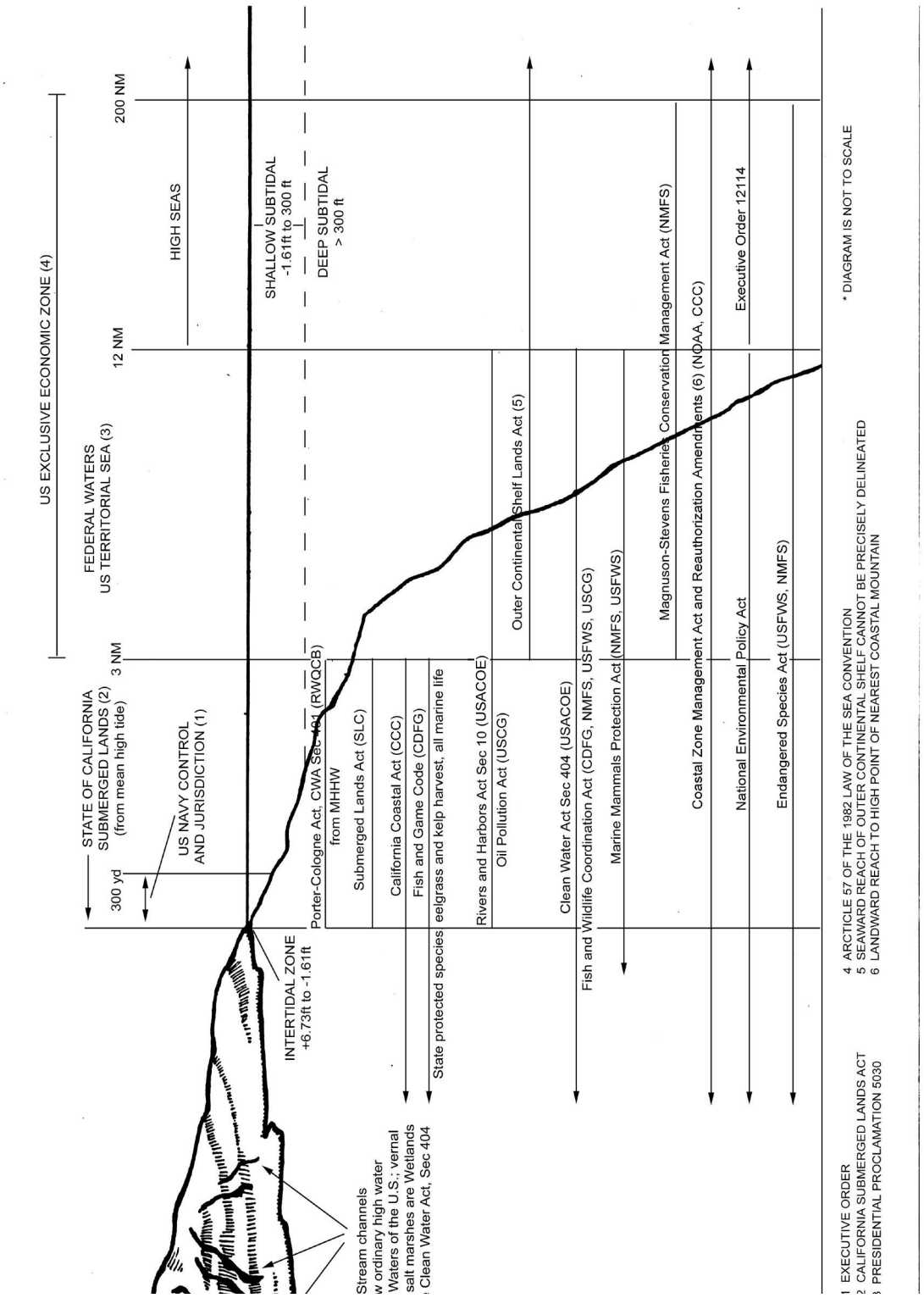


Figure 2-2. Legal control and jurisdictions relevant to managing San Nicolas Island.

2.5.2 Most Relevant Federal, State, and Local Laws and Regulations

This INRMP supports SNI's compliance with federal and state laws, such as those related to environmental documentation, wetlands, endangered species, and land and wildlife management. Table 2-6 provides an overview of federal government laws and concomitant regulations that must be considered when managing SNI's natural resources. This table identifies the applicable laws for each federal agency involved in oversight of natural resource management at SNI. Laws may be identified more than once in Table 2-6 if they guide the management actions of more than one federal agency.

Detailed descriptions of the most relevant federal, state, and local laws and regulations are included in Appendix B. The purpose of Appendix B is to give an overview of the most influential laws and regulations that can pertain to all types of projects occurring on SNI. Natural resources consultation requirements, including any current or planned consultations, consistency with ESA Recovery Plans, RWQCB Basin Plans, and with EFH permit and consultation processes are all discussed in Appendix B.

Table 2-6. Government regulations to be considered in San Nicolas Island natural resources management.

Federal Agencies and Applicable Laws	Authority and Activities
U.S. Army Corps of Engineers (USACE)	
Clean Water Act, Section 404	Responsible for issuing Section 404 permits for placement of dredge and fill material into waters of the U.S. (up to higher high water line in tidal waters) and into wetlands in compliance with EPA regulations.
Rivers and Harbors Act of 1899, Sect. 10	Regulates construction, excavation, and deposition in navigable waters (up to mean high water in tidal waters).
National Environmental Policy Act	Commenting or lead agency authority for environmental review of proposed projects.
U.S. Environmental Protection Agency (EPA)	
Clean Water Act, as amended	Develops Section 404 regulations and may veto USACE Section 404 permit. Regulates waste disposal in coastal waters. Administers National Estuary Program.
National Environmental Policy Act	Commenting authority on proposed projects.
U.S. Department of the Interior, U.S. Fish and Wildlife Service (USFWS)	
Fish and Wildlife Coordination Act	Reviews/comments on federal actions that affect many habitat-related issues, including wetlands and waters considered under Clean Water Act Section 404 and Rivers and Harbors Act Section 10 permit applications.
Federal Endangered Species Act	Regulates, monitors, and implements programs for protecting the ecosystem upon which freshwater and estuarine fishes, wildlife, and habitat of listed species depend. Enforces international treaties and conventions related to species facing extinction.
Migratory Bird Treaty Act	Enforces prohibition against the taking of migratory birds, their eggs, or their nests.
National Environmental Policy Act	Commenting authority on proposed projects.
National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NMFS)	
Fish and Wildlife Coordination Act	Reviews and comments on federal actions that affect marine fishery resources and many habitat related issues, including Clean Water Act Section 404 and Rivers and Harbors Act Section 10 permit applications.
Federal Endangered Species Act	Jurisdiction over most threatened or endangered marine species.
Magnuson-Stevens Fisheries Conservation and Management Act	Responsible for maintaining and conserving fisheries and rebuilding overfished stocks. Responsible for determining whether projects or activities adversely impact Essential Fish Habitat zones (those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity).
Marine Mammal Protection Act	Enforces protection provisions for marine mammals.
National Environmental Policy Act	Commenting authority on proposed projects.
U.S. Coast Guard (USCG)	
Oil Pollution Act of 1990	Ensures clean up of marine oil spills and other pollutants. Responsible for oil spill responses based on Area Contingency Plan. Prepares most regulations needed for implementation of Oil Pollution Act.
Fish and Wildlife Coordination Act	Commenting authority on navigational issues, such as structures affecting navigation, USACE Section 404 dredge and fill permits, and new pilings.
Rivers and Harbors Act of 1899, Sect. 10	Issues permits for bridges over navigable waters (up to mean high water line).
Clean Water Act/Marine Protection, Research, and Sanctuaries Act	Enforces standards of oil and other hazardous waste discharge in marine waters.

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3.0 Current Condition of Natural Resources

3.1 Ecoregional Setting

San Nicolas Island is the outermost of the eight islands comprising the California Channel Islands chain located off of southern California (see Map 1-1). The California Channel Islands are notably different from each other with respect to climate, geology, history, landforms, maximum elevation, size, and vegetation. The eight islands have been divided into two major groups: (1) the Northern Channel Islands of San Miguel, Santa Rosa, Santa Cruz and Anacapa, and (2) the Southern Channel Islands of Santa Barbara, San Nicolas, Santa Catalina, and San Clemente. The islands represent emergent portions of a complex system of submarine canyons and ridges in a geomorphic province referred to as the California Continental Borderlands (Vedder and Howell 1980). San Nicolas Island lies within the SCB on the Santa Rosa-Cortez Ridge, one of several northwest-trending ridges, which characterize the offshore region. The Southern Channel Islands are aligned in a north-south orientation and are more geographically isolated from each other and the mainland compared to the Northern Channel Islands, which are clustered together and lie with their long axis in an east-west direction.

The Channel Islands are influenced by ocean circulation, insularity, and human occupation. At various times in geologic history, they have been sculpted by tectonic action, changes in sea level, ecological influence from the mainland, and human inhabitance, producing unique ecological settings that include many endemic species.

3.1.1 Insularity and Consequences of Isolation

The Channel Islands have evolved over thousands of years to host a multitude of endemic flora and fauna distinct from adjacent mainland areas. These endemic species have in some cases adapted to narrow island niches of the Channel Islands or an individual island. Existing endemic populations are of high value because they represent adaptations to unique island habitats and provide excellent indicator species to track changes within island ecosystems and assess the status of current and desired conditions. Due to their isolated evolution and distinct habitat associations, the vulnerability of endemic species on SNI, and the other Channel Islands, are subject to decline from direct impact or habitat modification to a much greater degree than mainland species.

3.1.2 Historical Versus Current Conditions

Few detailed descriptions of the landscape of SNI are available prior to the introduction of sheep ranching in the mid 1850s. However, there is an early reference to woody vegetation made by Captain George Nidever, a sea otter hunter, in the fall of 1852. Ranching began on the island by the middle of the 19th century and continued until June 1943. During the first half of the 20th century, sheep numbers on SNI apparently varied between 1,200 and 3,000 animals, until they were removed during World War II. As a result of these ranching activities, the introduction of non-native plants and grazing animals had profound effects on the plant communities of SNI (Junak 2008). Ranching on the Channel Islands changed the land cover of large areas from

native scrub to grasslands dominated by alien annual grasses. This conversion of the vegetation from one type to another has had grave consequences for some of the island endemics, which depend upon habitats that are no longer intact (USGS 2003).

Past land uses and fishing practices by Native Americans, transient Europeans, and American occupation (including grazing and fishing) have affected the composition and distribution of terrestrial and marine communities and associated wildlife on SNI. Refer to Figure 3-1 for a depiction of timeline. The full extent of the changes are unknown because of the lack of baseline data on historic conditions, biological monitoring, or even periodic biotic surveys. It is not known whether the current trajectory of change is towards historic conditions or some new equilibrium.

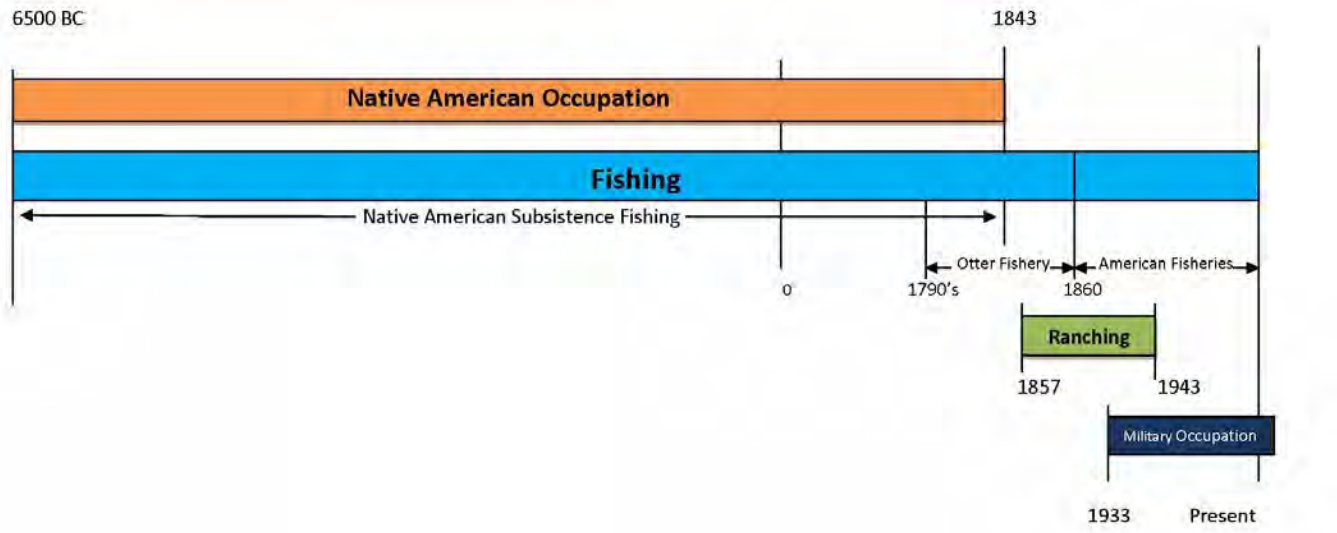


Figure 3-1. Timeline of resource use and occupation of San Nicolas Island.

The timeline in Figure 3-1 highlights human occupation time frames and some significant land use practices that historically occurred on SNI. Information regarding the Native American use of island resources is described from archeological investigations and centers primarily on marine resources but overall anthropogenic changes to the island's terrestrial and marine habitats are undoubtedly an assimilation of human inhabitance and resource use throughout the timeline. Since the ranching era ended, changes to the island's biological communities and landscape are most notably from continued wind and water erosion impacts proliferated from historical grazing practices and from Naval operations involving construction, accidental fires, borrow pits, and facilities. The introduction of non-native species both accidentally and intentionally during the human occupation of the island have prompted new challenges to the floral and faunal landscape that continue to effect the island's ecological condition.

3.2 Climate and Climate Change

The climate of SNI is highly maritime and is included within a broader-scale Mediterranean-type climatic regime that is characterized by cool, wet winters and warm, dry summers (De Violini 1974; Philbrick and Haller 1977; Moody 2000).

Average monthly temperatures on SNI range from a low of 55.6 degrees Fahrenheit (°F) (13.1 degrees Celsius [°C]) in January to a high of 64.7°F (18.2°C) in September (WRCC 2009), with average maximum temperatures of 71°F (22°C) in September (Figure 3-2). Freezing temperatures have not been recorded on the island; the minimum of 33°F (0.5°C) was recorded in January 1949 when a light snow fell. Temperatures above 100°F (38°C) are occasionally experienced on the island; a 25-year maximum temperature of 106°F (41°C) was recorded in September 1955 (De Violini 1974).

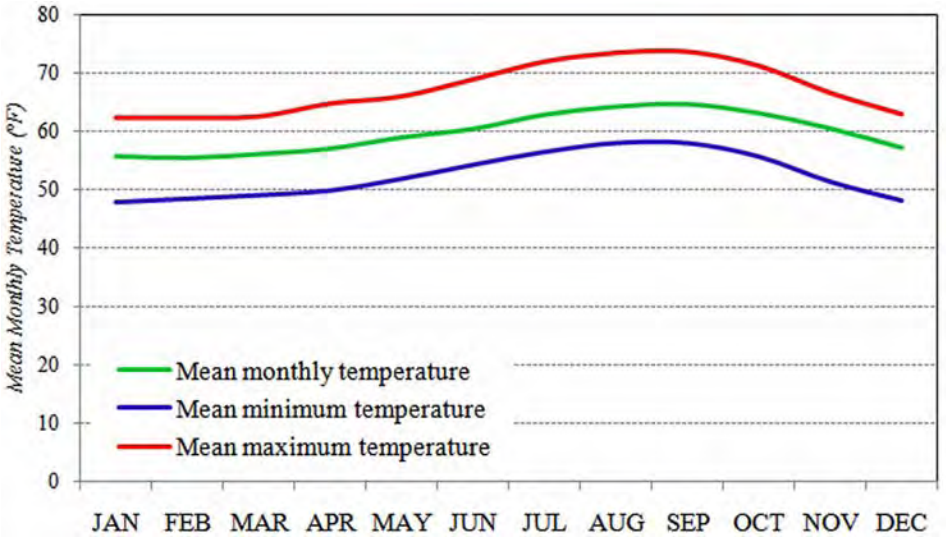


Figure 3-2. Monthly temperature regime on San Nicolas Island (WRCC 2009; NAWCWD 2004).

As is typical for southern California, the bulk of the rain on SNI falls from November through March (WRCC 2009), with very little falling from May through September (Figure 3-3). Average annual rainfall on SNI is highly variable. From 1948-2005 an average of 8.2 inches (20.8 centimeters [cm]) of rain fell per year, ranging from a minimum of 2.6 inches (6.6 cm) in 1961 to a maximum of 21.8 inches (55.4 cm) in 1998 (Figure 3-4; Junak 2008). Data from four coastal weather stations (San Diego Airport 1921-2009, Laguna Beach 1929-2008, Newport Beach 1922-2009, and Oxnard 1924-2003) indicate that SNI receives approximately 4 inches (10 cm) less rain per year on average than does the mainland (WRCC 2009). These four coastal stations averaged 11.9 inches (30.2 cm) in the same years available from SNI. Since data for SNI are not available up through 2009, the data from the coastal stations are included here to illustrate the drought conditions that have prevailed in the region in recent years. Since SNI tends to average several inches less rainfall per year compared to the mainland, the drought indicated by the coastal weather data is likely to have been even more severe on SNI.

Cold oceanic water interfacing with warm inland air masses create dense fog during certain times of the year. The interactions between the strong winds, marine fogs, and islands topography promote distinct microclimate zones at various island aspects. The northern and western portions of SNI obstruct prevailing wind flow increasing the interaction of moisture laden low stratus clouds moving over the open ocean with the island. Considering average annual precipitation of the island is approximately 8.2 inches (20.8 cm), moisture derived from fog and cloud drip contribute significantly to island ecosystems. Precipitation on the island is the only source of fresh ground water on SNI, according to Burnham *et al.* (1963).

A dominant feature of island weather is the prevailing northwest wind, which averages 16 miles per hour (mph) (14 knots) with an annual mean maximum of 60 mph (52 knots). The island presents an obstruction to the prevailing wind flow.

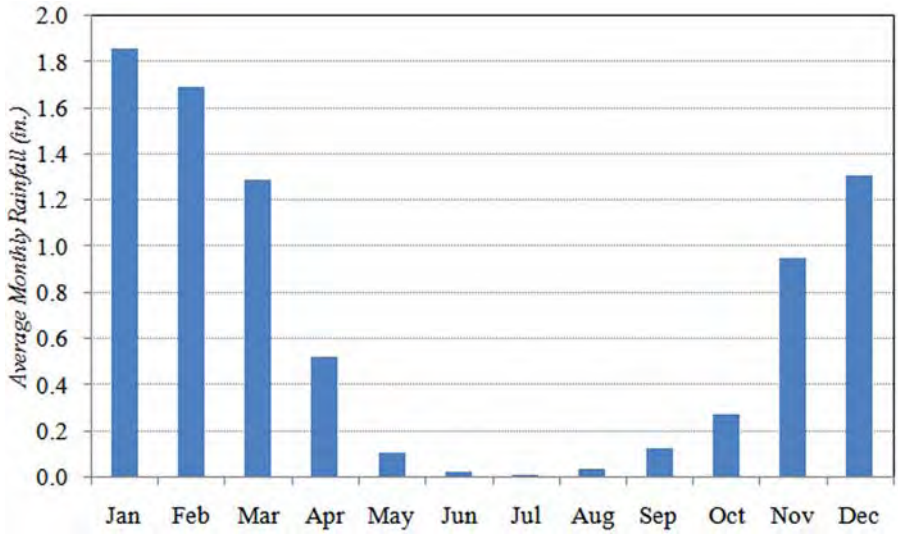


Figure 3-3. Mean monthly rainfall on San Nicolas Island (WRCC 2009).

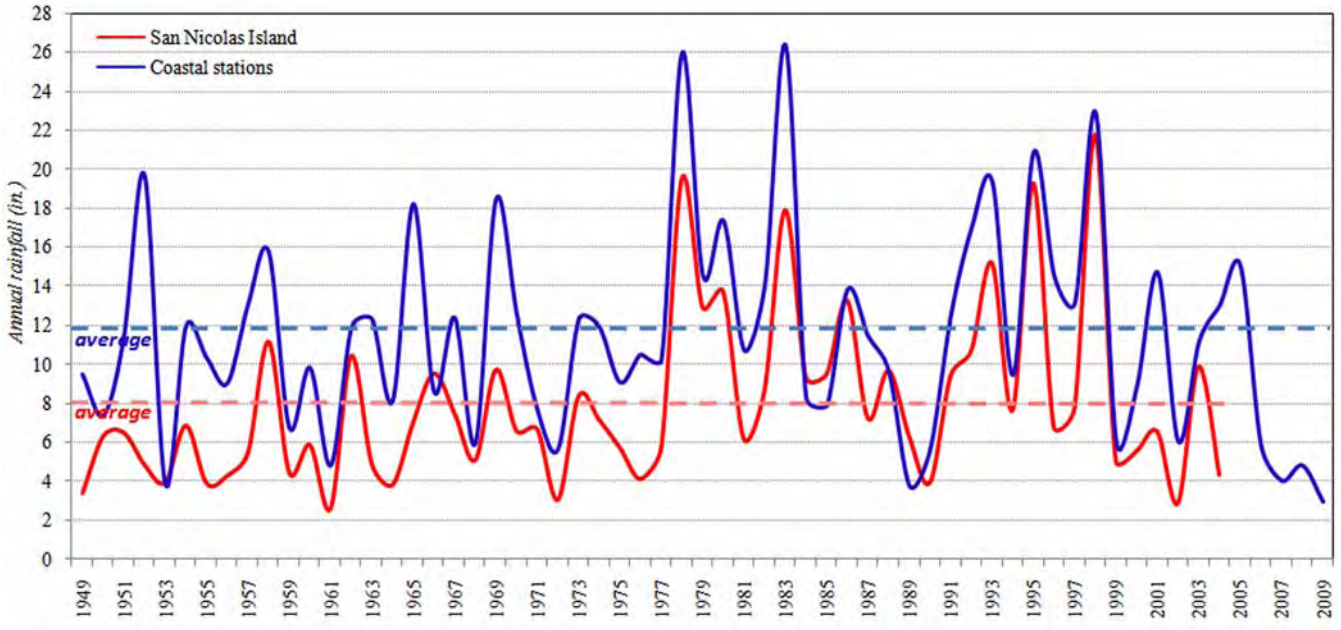


Figure 3-4. Average annual rainfall total for San Nicolas Island (1949-2004) and four coastal weather stations (1949-2009) (WRCC 2009; Junak 2008).

3.3 Physical Conditions

3.3.1 Topography

San Nicolas Island's topography was initially formed and subsequently shaped by changes in sea level and differential uplift of the island (Vedder and Howell 1980). San Nicolas Island is the one Channel Island that is not directly of volcanic origin as it does not have igneous rock formations. San Nicolas Island rose from the seafloor, being exposed for the last one million years. From the sea, SNI presents a low, table-like profile containing fourteen distinct marine terraces all of which have been dated and used to establish sea level changes over the last one million years. The island

topography is dominated by a broad terrace or mesa with no distinctive peaks (Map 3-1). This mesa covers most of the surface area of the island, being roughly 6.4 miles (10.3 km) long and 2.1 miles (3.4 km) wide (USGS 1:24,000 Topographic Map, SNI California). The main axis of the island runs from northwest to southeast and the mesa slopes gently to the northeast from the highest points, which are near the south rim of the terrace. The highest point on the island is Jackson Hill at 907 feet (276 m), and the majority of the mountainless island is comprised of shifting sand dunes.

Cliffs along the northern perimeter of SNI's central mesa lead to seven well-defined marine terraces visible on the north side of the island. The most notable geographic feature of SNI is the series of Eocene marine terraces. Numerous terrace levels range from underwater depths of about 400 feet (122 m) to an elevation of 900 feet (274 m). Terraces are covered by windblown sand (dune) deposits that decrease in depth from northwest to southeast. The average surface elevation is 500 feet (150 m).

3.3.2 Geology

San Nicolas Island is thought to be underlain by the Franciscan formation, which consists of a variety of rocks including deep-marine sedimentary rocks as well as metamorphosed igneous rock. Eocene marine terraces on SNI are comprised of sandstone formed as a result of sand from the sea floor being compressed by the weight of the overlying sea. Changes in sea level and tectonic uplift eventually exposed the sandstone to a variety of erosional processes, such as wind, waves, and rain that gradually sculpted SNI into its current state. Underlying dune sands and marine terrace deposits are alternating layers of Tertiary marine sandstone and siltstone. All units have been folded into a broad anticline. The axis of this fold runs parallel to the length of the island, plunges slightly southeast, and is offset by several Pre-Quaternary faults (Vedder and Norris 1963).

According to Vedder and Norris (1963), the exposed Tertiary section on the island consists of nearly 3,500 feet (1,067 m) of alternating marine sandstone and siltstone beds that contain minor amounts of interembedded conglomerate and pebbly mudstone. Vedder and Norris divided this sedimentary rock sequence into 35 mapable units, all of Eocene age, and they reported that several small andesitic dikes of Miocene age intrude the sedimentary rocks near the southeastern end of the island. They found that dune sand and fossiliferous marine terrace deposits of Quaternary age cover most of the central and western parts of SNI.

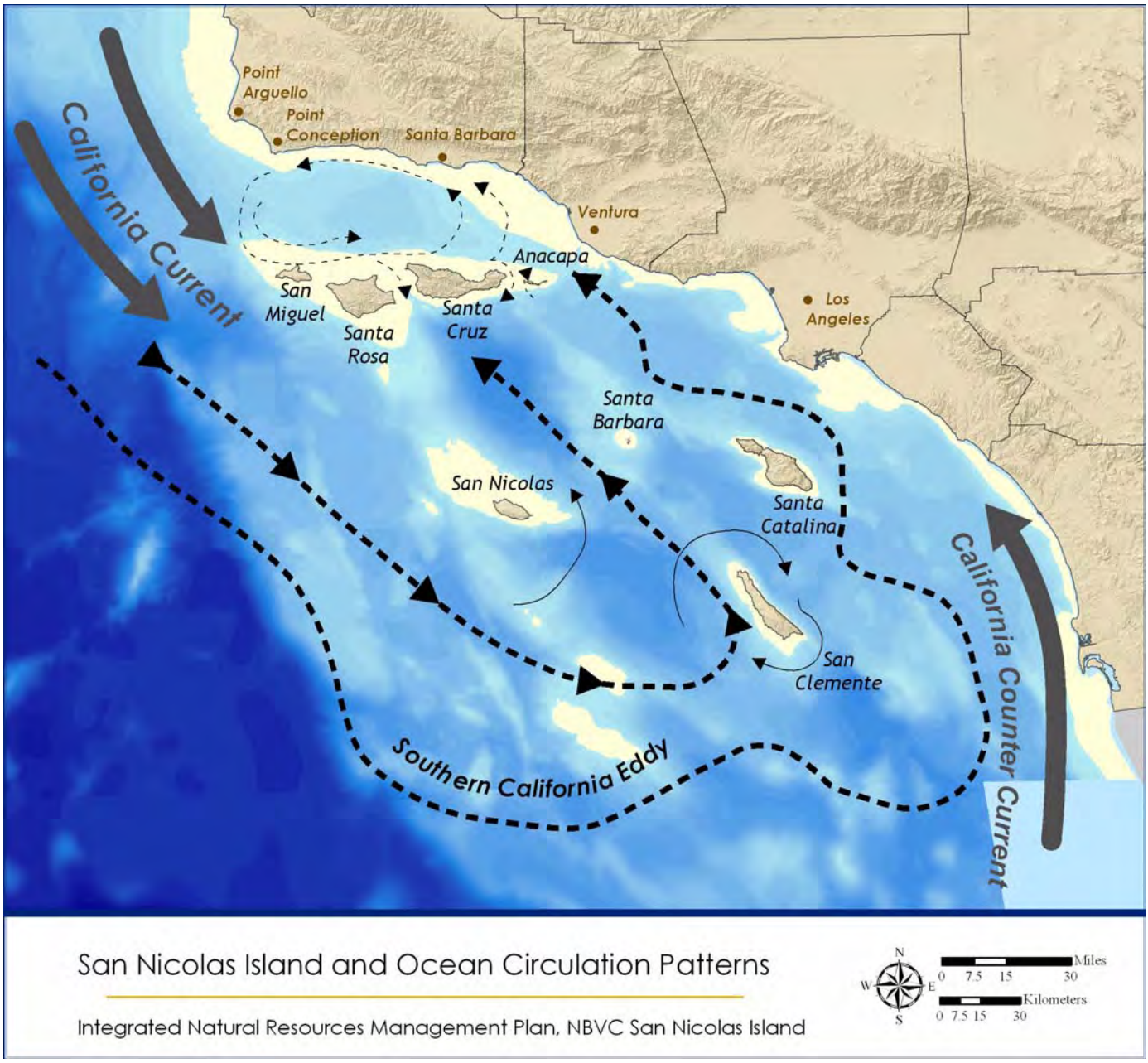
Fossils of Eocene rocks are predominantly foraminifera, which can be correlated with those of other geologic formations throughout southern California. Fossils of marine terrace deposits consist of over 250 species of mollusks and other invertebrates. These assemblages are presumed to occur throughout marine terraces on SNI and are unique in their completeness (Vedder and Norris 1963). The fossils "…represent one of the most complete sequence of fossil assemblages from successive terrace levels in southern California and contain the largest faunas reported from terrace levels higher than 500 feet (150 m)" (Vedder and Norris 1963).

3.3.3 Hydrology

During their investigations, Burnham *et al.* (1963) found no evidence of any geologic feature that would allow fresh water to move between the California mainland and SNI. They stated that groundwater on the island is recharged by deep penetration of rainfall and runoff into the highly absorptive fresh dune sand at the west end, which gravity moves downward to the main water table or to impermeable zones that divert the water laterally downslope. Groundwater is discharged at the island's surface by a number of intermittent, as well as some perennial, springs and seeps concentrated along the north side of the island (Burnham *et al.* 1963). The limited sources of groundwater play a vital role in vegetation community structure contributing to the geographic partitioning of vegetation found on SNI.

Map 3-1. Topography at San Nicolas Island.

The climate, and ultimately terrestrial hydrology, of the Channel Islands are also influenced by the general ocean circulation patterns in the SCB. Current dynamics are dominated by convergence of the California current and the California counter current (Map 3-2) and are modified by complex bottom topography, shoreline morphology and the presence of the islands (Browne 1994). The cold, southward flowing California Current is pushed offshore just west of the northern Channel Islands at Points Arguello and Conception. The release of the coastal waters from the influence of the California Current, in combination with the California counter current, admits a large scale, counterclockwise flow (Southern California Eddy) which influences the entire Channel Island system (Browne 1994; Engle 1994). The southward flowing limb of the Southern California Eddy is held outside the Santa Barbara and San Pedro channels, and brings cold water to the more oceanward islands such as SNI and San Miguel Island. These oceanographic circulation patterns directly affect the formation of low stratus cloud formation and the formation of coastal fog.



Map 3-2. Channel Islands and adjacent mainland. The intermediate beige tone surrounding each island approximates the extent of the islands at sea level minima (17,000–18,000 yr BP). The large southward pointing arrows (dark) represent the California Current. The large northward pointing arrow (grey) indicates the California counter current. The large dashed lines indicate the Southern California Eddy. The small dashed lines indicate a small eddy flow in the Santa Barbara Channel. (Modified and combined from Seapy and Littler 1980, and Browne 1994.)

The terrestrial hydrology of SNI may also be directly influenced by coastal fog as a summer moisture source. California's "fog belt" is located along the immediate coast of the mainland and of its offshore islands and is subject to persistent summer fog and overcast conditions (Fischer *et al.* 2008; Raven and Axelrod 1978). Coastal fog and overcast conditions both result from low stratus cloud formation. The distinction is that "overcast" is a cloud layer above the surface that obscures all (or most of) the sky, while "fog" is in contact with the surface and reduces visibility to below one kilometer (National Weather Service [NWS] 2007). Both fog and overcast conditions can reduce the severity of plant drought stress during the summer rainless season, through different mechanisms (Fischer *et al.* 2008). Previous studies in the California fog belt have shown that stratus clouds can enhance the availability of water to the ecosystem during the rain-

less summer through fog drip (Fischer *et al.* 2008; Kennedy and Sousa 2006; Corbin *et al.* 2005; Cole 2005; Burgess and Dawson 2004; Dawson 1998; Ingraham and Matthews 1995; Jacobs *et al.* 1985; Azevedo and Morgan 1974). For more information on how summer fog and overcast conditions may affect drought stress and ecological functioning of coastal California endemic plant species refer to Fischer 2008.

3.3.4 Soils and Soil Condition

The central and northeastern parts of the island are covered by marine terrace deposits and the western end of the island is covered by deep (up to 75 feet [23 m] thick) dune sand deposits composed of wind-transported medium grain sand (USDON 2005a). Marine terrace deposits are composed of unconsolidated clayey, silty sands. Some of these are cemented together by caliche, a cement-like calcium carbonate deposit formed by the downward percolation of rainwater. The rest of SNI is covered with sandy loams. Sandy beaches are scattered along the coast.

The U.S. Soil Conservation Service (USSCS; now the Natural Resources Conservation Service [NRCS]) (Estrada 1985) mapped 27 soil units on SNI, including beach and dune sand; Jehemy clay; several sandy loams and loamy sands; rock outcrops; and eroded, channeled, and gullied complexes. Rock outcrops (3,699 acres [1,497 ha]), Vizcapoint severely eroded land complexes (1,270 acres [514 ha]), dune sand (1,158 acres [469 ha]), and Vizcapoint sandy loam (1,079 acres [437 ha]) were identified as the most common soil types on the island.

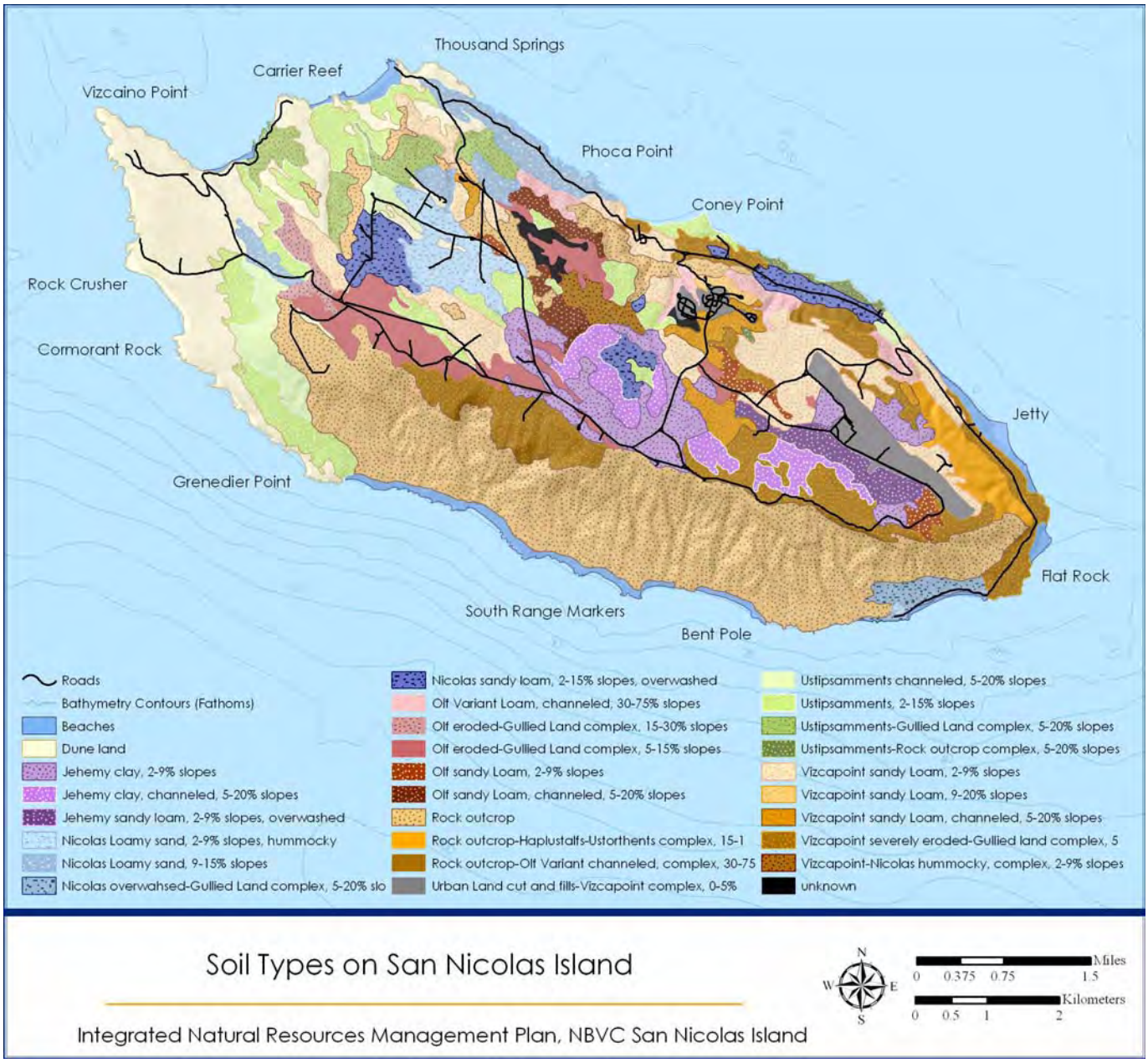
Most island soils are rated as severely limited for construction, are highly susceptible to erosion by wind, and are moderately erodible by water (Estrada 1985; USDON 2005a). Map 3-3 depicts the soils of SNI.

Erosional forces from seasonal rainfall and consistent northwest winds in conjunction with grazing effects have facilitated the loss of surface soil particles to the adjacent nearshore waters, especially along the steep southern edge of the island. The Vizcapoint sandy loam soil layer is virtually nonexistent, presumably eroded away due to these factors.

3.3.5 Water and Sediment

Nearshore waters of SNI are regulated by oceanic circulation and hydrology as reviewed in the "Ecology of the Southern California Bight: A Synthesis and Interpretation" (Dailey *et al.* 1993). Springs are the only perennial source of fresh water on the Island. San Nicolas Island has limited surface fresh water sources that only persist during seasonal rainfall events. There are no perennial surface fresh water streams that run to SNI's shoreline. Erosion and sediment input do affect streams and nearshore waters. These erosion events occur primarily during seasonal rain fall events. Current conditions and annual monitoring performed by ASBS tracks point and non-point source inputs from SNI. Current and historic sea surface temperatures, predominant winds, and waves are archived in NOAA NWS Los Angeles/Oxnard records.[1]

1. The NOAA NWS Los Angeles/Oxnard records are accessible at: http://www.wrh.noaa.gov/lox.



Map 3-3. Soil mapping units of San Nicolas Island (Estrada 1985).

The nearshore waters around SNI to a depth of 300 feet (91 m) are designated as an ASBS by the SWRCB. The ASBS designation of SNI nearshore waters enacted in 1974 established regulations and guidelines pertaining to water quality concerns and focused on the beneficial uses of water resources related to surface water runoff, point source discharge, and the potential biological impacts for the water input. Beneficial uses for water resources at SNI include consumption, navigation, water contact recreation, commercial and sport fishing, shellfish harvesting, and preservation of terrestrial and marine habitats and rare, threatened or endangered species (LARWQCB 1994). The SWRCB and the RWQCB recognize that most beneficial uses of water resources are to some degree mutually antagonistic; therefore, waste discharge requirements can at best provide relative protection for all beneficial water resource uses. The concept of an area of special biological significance recognizes that certain biological communities because of their value or fragility deserve very special protection consisting of preservation and maintenance of natural water conditions to the extent practicable (SWRCB and RWQCB 1970). For more information regarding the means by which the SWRCB accomplishes this goal refer to *Appendix B, Section B.4: California State Laws*.

3.4 Terrestrial Vegetation and Flora

3.4.1 Overview

The significance of the Channel Islands natural communities stems from the islands' remote, isolated position at the confluence of two major ocean currents, resulting in two biogeographical provinces in the ocean, the Oregonian and the Californian, and a dynamic transition zone between them. The resulting climate produces a Mediterranean-type island system that sustains high biological endemism. San Nicolas Island's position at the southern-most intersection between the California current and California counter current (see Map 3-2) in conjunction with its isolation from the mainland, topography and soil types have manifested distinctive natural communities relative to adjacent islands. Finally, native vegetative communities have been greatly altered by people and the introduction of non-native species, and are in various stages of change.

Vascular flora of SNI has strong floristic affinities with nearby geographic regions including the southern California mainland and the other Channel Islands. The vascular flora of SNI includes 273 species from 172 genera, of which 140 of those species are non-native (Junak 2008). San Nicolas Island has limited species diversity when compared to the other California Channel Islands, presumably due to its isolation and relative lack of topographic diversity (Junak 2008). Plant nomenclature used in this report is consistent with Junak (2008) since this is the most recent treatment of the SNI flora.

■ **For more information on non-vascular plants refer to *Section 3.4.4: Non-Vascular Flora - Microbiotic Crusts*.**

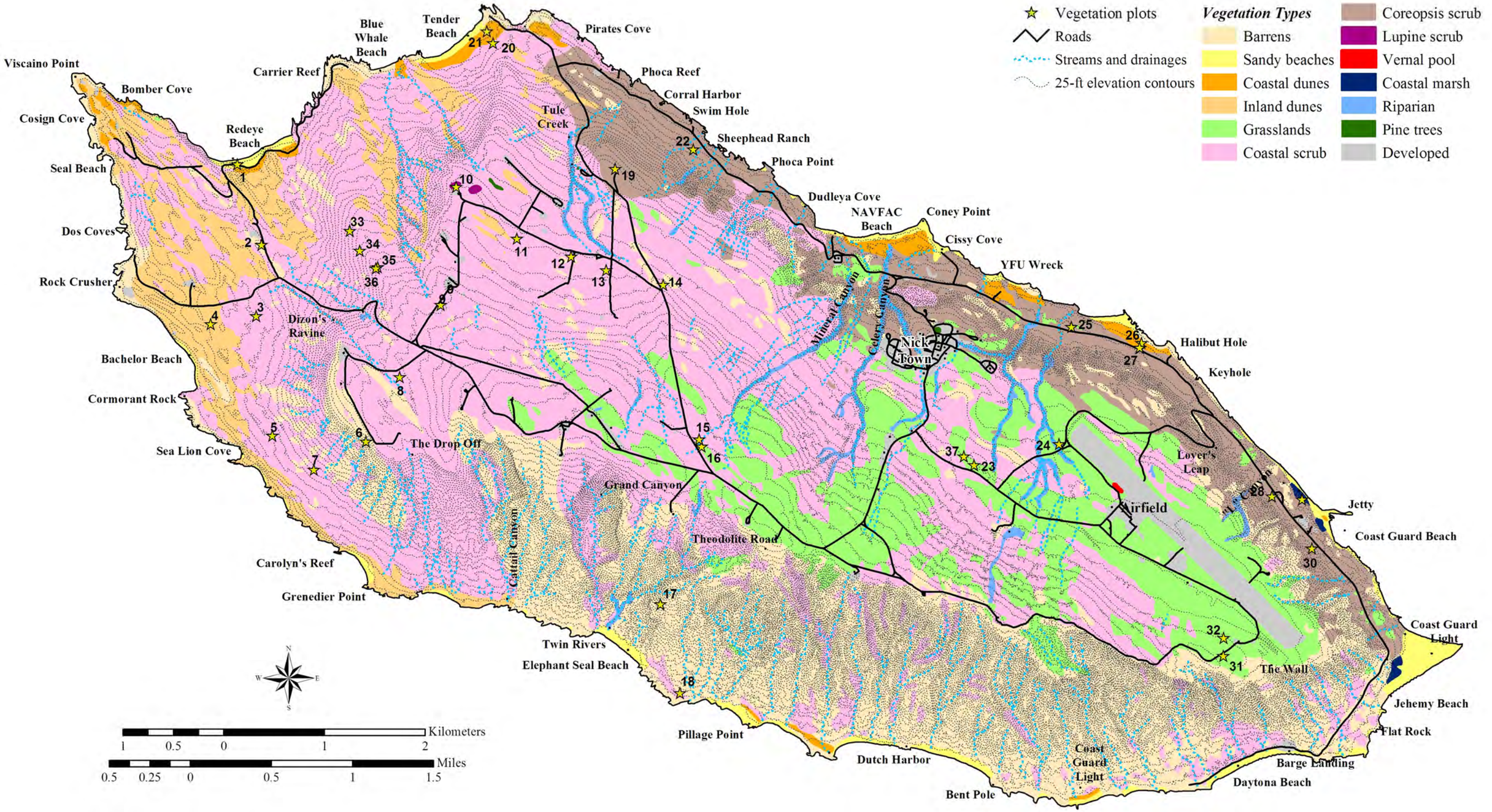
Non-vascular plants are also important ecological components of the flora of SNI. The species diversity and ecology of non-vascular plants on the island are poorly understood, although some checklists have been compiled for mosses and lichens (Appendix E). The most important non-vascular plants in the ecology of SNI may be mycorrhizal fungi, soil algae, and blue-green algae (Cyanobacteria), which help to form soil crusts, stabilize soils, and may be vital to repopulation and survival of shrubs.

3.4.2 Vegetation Communities

A survey of the plant communities for the purpose of mapping and describing them was conducted from February to June 1992 by Halvorson *et al.* (1996). Twelve vegetation communities (Map 3-4; Table 3-1) were identified on SNI (Halvorson *et al.* 1996), including five scrub communities (Caliche, Isocoma, Baccharis, Lupinus, and Coreopsis), freshwater aquatic vegetation communities such as vernal pools and riparian communities, coastal and inland dunes, beaches, coastal marshland, native and nonnative grasslands, and disturbed and developed types also occur. Barren areas, which support no vegetation, also occur. These vegetation communities were classified based on 103 relevé plots. The description resulting from this work was the first quantitative analysis of the vegetation of SNI, and provides a baseline against which future floristic comparisons can be made. The current vegetation classification system used by Halvorson *et al.* (1996) combines the work of Foreman (1967), Philbrick and Haller (1977), Halvorson *et al.* (1996), Junak *et al.* (1996), and Junak (2003). The classification is a physiognomic one (based on vegetation structure or form), and is similar to that used on other Channel Islands, and so allows comparison to those flora.

The flora of SNI, its relation to other islands and the mainland, disturbance history and patterns of endemism were analyzed most recently by Junak (2008). Field surveys for special status plants had been conducted during the spring and summer of 1992 and 1993 to determine the distribution, habitat characteristics, and population status of 11 special status plant taxa (Junak *et. al* 1996). An additional 14 sensitive taxa were mapped on SNI during an earlier phase of this survey. These taxa are restricted to the California Channel Islands, are of local concern, or have been identified as sensitive species by the USFWS, State of California, or the California Native Plant Society (CNPS).

Vegetation Monitoring Transects on San Nicolas Island



Map 3-4. Vegetation communities of San Nicolas Island (Halvorson et al 1996).

Note: Plot #37 is not shown on this map. It located along road somewhere to the west of plot #23.

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Table 3-1. Vegetation communities of San Nicolas Island (Halvorson et al. 1996).

Vegetation Community	Area (acres)
BEACHES AND DUNES	
Beaches	234.4
Coastal dunes	138.6
Inland dunes	783.2
Scrubs	
Coreopsis Scrub	1348.7
Lupine Scrub	2.7
Coastal Scrub*	6003.0
GRASSLANDS AND OTHERS	
Grasslands	1739.3
Barren areas	3469.9
Vernal pools	0.8
Coastal marshes	9.1
Riparian	201.2
Pine trees (planted)	2.7
Developed areas	324.8

The Caliche, Isocoma, and Baccharis Scrub types are not delineated in the vegetation map, as they comprise a highly complex mosaic across the island.

Coastal Scrub

Coastal Scrub is the island's dominant land cover making up 51.6 percent of the land cover types on SNI. Coastal scrub is comprised of five defined scrub habitats (Halvorson *et al.*1996; Junak 2008).

Caliche Scrub. The most distinctive coastal scrub, Caliche Scrub, occurs at the southern boundary of the island's central mesa with several areas completely denuded of top soil (Junak 2008). The dominant feature of these sites is the presence of a calcium carbonate layer called caliche (Halvorson *et al.* 1996). This substance typically forms a hardpan layer in arid-land soils and can be accompanied by a thin layer of top soil. On SNI, the caliche layer has presumably been exposed by soil erosion caused by wind and water after the vegetation was removed by introduced grazing animals. Vegetation in these caliche areas is sparse because there are few pockets of soil where plants can grow. Eighteen of the 28 plant taxa typically found in this community are non-native, presumably due to the disturbed nature of the sites (Halvorson *et al.* 1996).

Isocoma Scrub. Isocoma Scrub (Photo 3-1), dominated by coast goldenbush (*Isocoma menziesii*), is one of the most common and widespread types on SNI (Junak 2008). This community is the most diverse assemblage on the island with 67 percent of the native species on the island occurring in this scrub community and diversity and richness of plant taxon varies between localized areas. Numerous patches of cactus (*Opuntia* spp.) occur in this community and can be locally dominant. The species most widespread over the landscape are bromes (*Bromus* spp.), wild carrot (*Daucus pusillus*), southern island silver lotus (*Lotus argophyllus* var. *argenteus*), and iceplant (*Mesembryanthemum crystallinum*) (Halvorson *et al.* 1996; Junak 2008).

Baccharis Scrub. Baccharis Scrub (Photo 3-2), dominated by coyote brush (*Baccharis pilularis*), is found in scattered patches on the central mesa, particularly in depressions, drainages, or other locations that are protected from wind (U.S. Navy 2005). Baccharis Scrub is also found in some of the canyons and drainages on the north side of the island (Halvorson *et al.* 1996). The most widespread associates in this community are bromes, Australian saltbrush (*Atriplex semibaccata*), slender wild oats (*Avena barbata*), silver lupine (*Lupinus albifrons* var. *douglasii*), and dunedelion (*Malacothrix incana*) (Junak 2008).

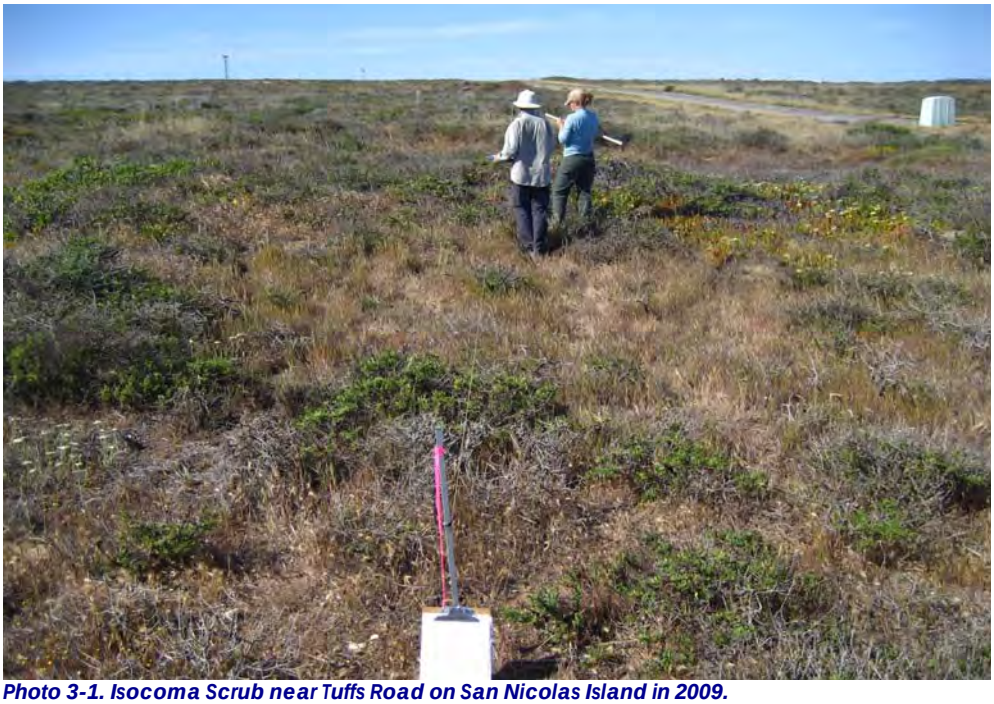


Photo 3-1. Isocoma Scrub near Tuffs Road on San Nicolas Island in 2009.

Lupine Scrub. Lupine Scrub occurs in two small patches of less than 3 acres (1.2 ha) and is rare on SNI; it occurs in sandy areas of coastal scrub and is dominated by silver lupine (U.S. Navy 2005). This scrub community occurs primarily on stabilized dunes on the north side of the island and the most prominent species in these areas is silver lupine. Common associates include sand verbena *(Abronia* sp.*)*, silver beach-weed *(Ambrosia chamissonis)*, bromes, beach primrose *(Camissonia cheiranthifolia* ssp. *cheiranthifolia)*, giant coreopsis *(Coreopsis gigantea)*, southern island silver lotus, and dunedelion (Junak 2008).

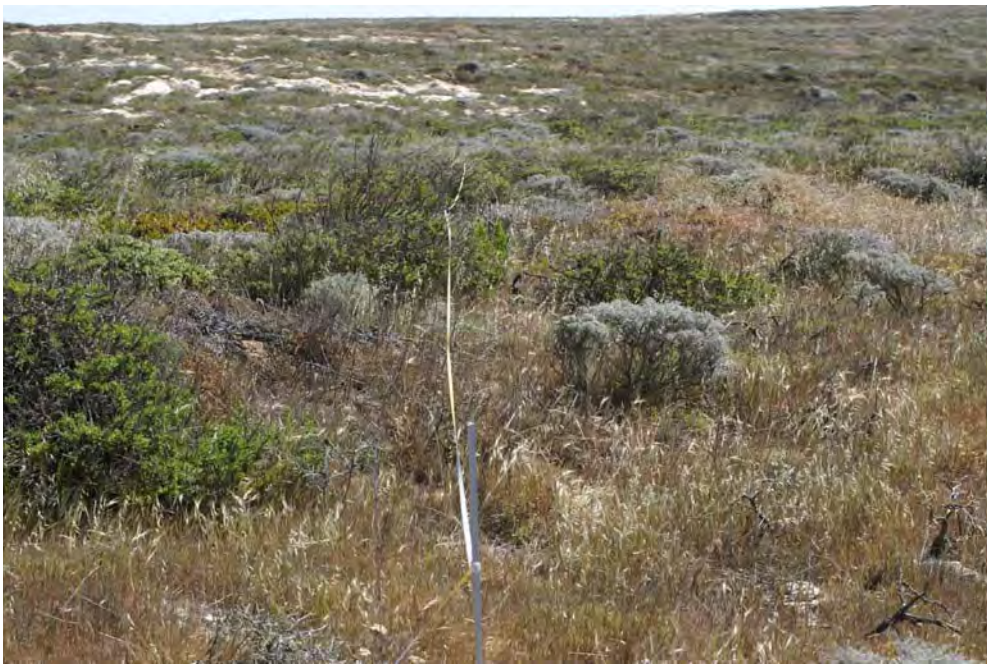


Photo 3-2. Baccharis Scrub at the western end of San Nicolas Island in 2009.

Coreopsis Scrub. Coreopsis Scrub (Photo 3-3) is dominated by giant coreopsis, and is the second most diverse community on SNI (Halvorson *et al.* 1996). This scrub community is conspicuous along the north facing slopes on the north side of the island because of its dense stands and distinct erect appearance. Most of the other scrub associations on the island are generally not much more than a meter tall, while Coreopsis Scrub often reaches heights of up to 6 feet (2 m) tall or more (Junak 2008). The community accounts for 1,348 acres (546 ha) (Halvorson *et al.* 1996) and noticeably changes in appearance between winter and summer seasons. The most widespread associates in this community typically include annual grasses (*Avena* and *Bromus* spp.), filaree (*Erodium* spp.), yellow sweet clover (*Melilotus indicus*), pygmy-weed (*Crassula connata*), rattlesnake weed, silver lupine, coastal goldenbush, San Nicolas Island malacothrix (*Malacothrix foliosa* ssp. *polycephala*), common sowthistle (*Sonchus oleraceus*), Australian saltbrush, silver beach-weed, burclover (*Medicago polymorpha*), southern island silver lotus, and dunedelion (Junak 2008).

Photo 3-3. Coreopsis Scrub near Shannon Road on San Nicolas Island in 2009.

Vernal Pools

Several vernal pools totaling 0.8 acre occur on the western and northeastern portions of the mesa (Halvorson *et al.* 1996). Vernal pools are landforms that are typically inundated during and after winter rains, and that support unique flora and fauna that have adapted to ephemeral aquatic conditions. These communities flourish in the late winter into the spring and become dry and dormant during summer months. The dominant species around the margin of the vernal pools on the central mesa is pale spikerush (*Eleocharis macrostachya*) (Halvorson *et al.* 1996; Junak 2008). Associates include toad rush (*Juncus bufonius*), sickle grass (*Parapholis incurva*), and Persian knotweed (*Polygonum argyrocoleon*) at some locations (Junak 2008).

Riparian Woodland

Riparian communities are mostly isolated on the southern side of the island in deep drainages within the islands canyon bottoms associated with intermittent streams, or in low spots on the mesa top where moisture accumulates (U.S. Navy 2005; Junak 2008). This habitat has been highly modified by erosion and human activity over the years and the small disturbed patches of riparian habitat on SNI comprise about 201 acres (Halvorson *et al.* 1996). Plants now found in canyon bottoms and other moist areas include cattails (*Typha* spp.), brass-buttons (*Cotula coronopifolia*), rabbitsfoot grass (*Polypogon*

monspeliensis), saltgrass (*Distichlis spicata*), spear-leaf saltbush (*Atriplex prostrata*), tall fescue (*Festuca arundinacea*), willow dock (*Rumex salicifolius* var. *salicifolius*), curly dock (*Rumex crispus* ssp. *crispus*), mulefat (*Baccharis salicifolia*), arroyo willow (*Salix lasiolepis*), myoporum (*Myoporum laetum*), horehound (*Marrubium vulgare*), celery (*Apium graveolens*), and common loosestrife (*Lythrum hyssopifolia*) (Junak 2008).

Grasslands

The grassland community (Photo 3-4) is a mixture of native and non-native species covering 1,738 acres (703 ha) (U.S. Navy 2005). Large areas on the mesa are dominated by non-native grasses, especially slender wild oats, bromes, and foxtail (*Hordeum murinum*) (Junak 2008). While non-native grasses account for the majority of the grasslands on SNI, there are some small patches with greater proportions of native grasses, primarily purple needlegrass (*Nassella pulchra*). Also the native annual vernal barley (*Hordeum intercedens*) can be very common in wet years and can dominate small areas (Junak 2008). Small, but very interesting, populations of native annuals occur in scattered areas, especially in grassy openings between shrubs on the northeastern coastal flats and in the northeastern portion of the central mesa. Goldfields (*Lasthenia gracilis*), owl's-clover (*Castilleja densiflora*), rattlesnake weed, clovers (*Trifolium* spp.), miner's lettuce (*Claytonia perfoliata*), pygmy-weed, and San Nicolas Island malacothrix can be locally common in these locations (Junak 2008). Australian saltbrush, an herbaceous perennial, is also an important component of the non-native grasslands.

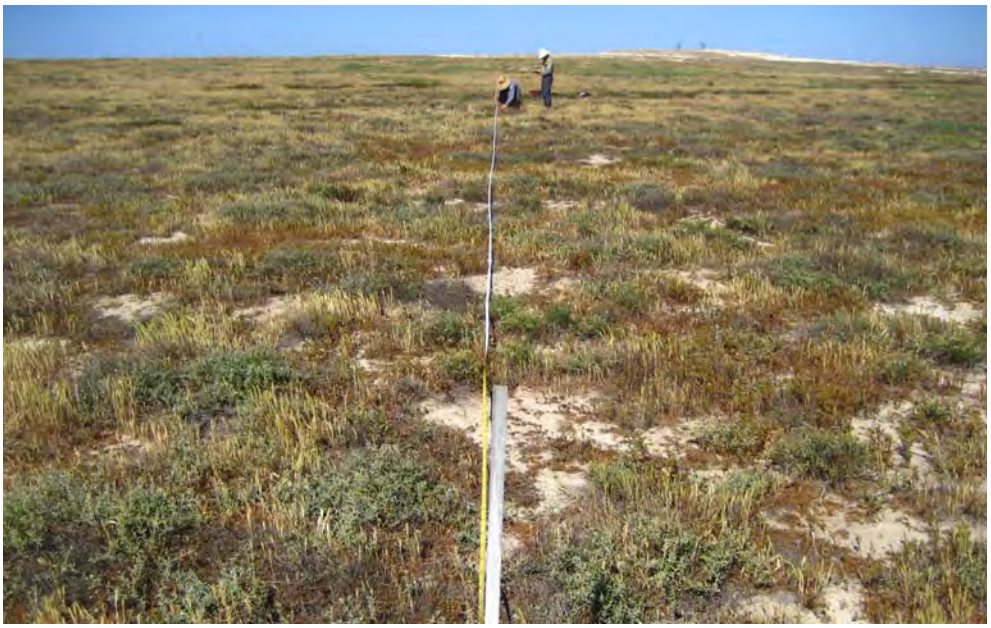


Photo 3-4. Grassland vegetation at the southeast end of San Nicolas Island in 2009.

Coastal Marsh

Coastal salt marsh occurs in a very small area on flats near the base of the sandspit at the southeastern end of SNI (Junak 2008). Coastal salt marsh accounts for about 10 acres (4 ha), or less than 0.1 percent of the Island (Halvorson *et al.* 1996). Pickleweed (*Salicornia depressa*) and alkali heath (*Frankenia salina*) are the dominant species (U.S. Navy 2005). Associates include saltgrass, iceplant, California saltbush (*Atriplex californica*), southern island morning-glory (*Calystegia macrostegia* ssp. *amplisima*), sickle grass, verbena (*Abronia* spp.), silver beach-weed, soft chess (*Bromus hordeaceus*), and large-flowered sand-spurry (*Spergularia macrotheca* var. *macrotheca*).

Beach and Dune

Sandy beaches and dunes encompass a majority of the coastline around SNI. The beaches are largely unvegetated, but the dune areas can be divided into two types, unstabilized coastal dunes and stabilized inland dunes.

Unstabilized dunes (Photo 3-5) account for approximately 138 acres (56 ha) (Junak 2008). Plant communities on unstabilized dunes are diverse and scattered, with no species dominating large areas (Halvorson *et al.* 1996). Sticky sand-verbena (*Abronia maritima*) occurs near the water and is the most abundant plant species. Dunedelion, silver lupine, beach sand-verbena *(Abronia umbellata)*, silver beach-weed, iceplant, island morning glory, beach primrose, and silver birdsfoot trefoil also occur on the coastal dunes (U.S. Navy 2005).

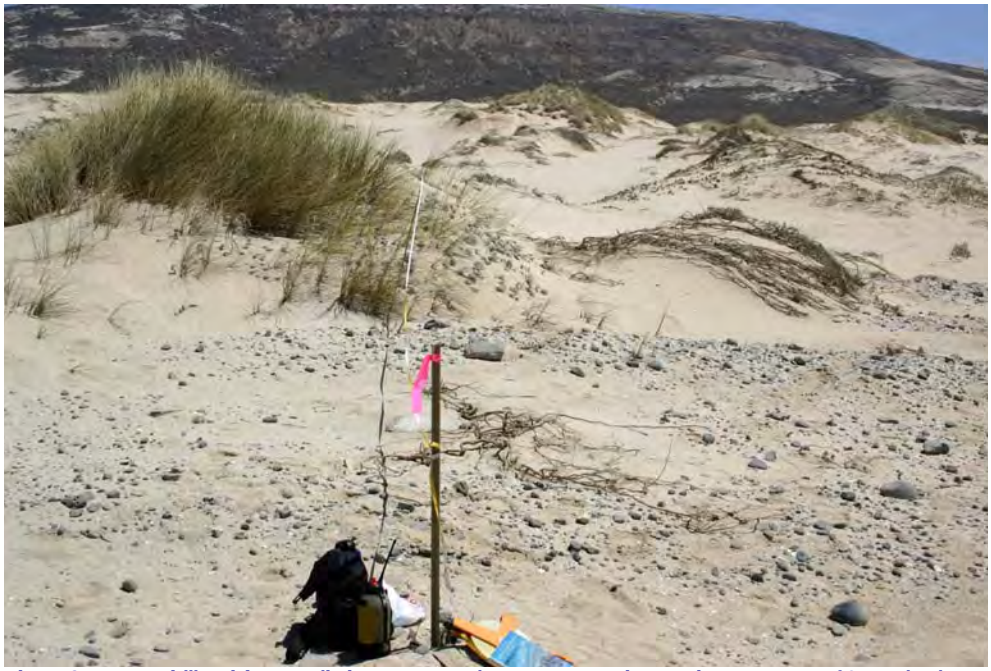


Photo 3-5. Unstabilized (coastal) dune vegetation type near the northwest coast of San Nicolas Island in 2009.

Stabilized dunes (Photo 3-6) account for approximately 783 acres (317 ha) (Junak 2008). Hottentot fig *(Carpobrotus* spp.*)* and Trask's milkvetch *(Astragalus traskiae)* are common, especially on the west end of the island where some areas are dominated by large stands of milkvetch, which is endemic to SNI and Santa Barbara Island (Junak 2008). Other widespread species in the stabilized dune areas include sand verbena, silver beach-weed, brome, sea- rocket (*Cakile martima)*, beach primrose, filaree, silver birdsfoot trefoil, silver lupine, and dunedelion (Junak 2008).

Developed Areas

Developed areas occur primarily on the eastern end of SNI, covering 324 acres (131 ha). The island has approximately 47 miles (76 km) of roads, with 22 miles (35 km) paved, and a 10,000-foot (3,048 m) concrete and asphalt runway. Daytona pier was recently constructed to support loading and unloading of barge and minimize the disturbance effects to adjacent pinniped colonies. Major facility locations are summarized in Map 1-2. Developed land supports no native vegetation and often contains structures, such as buildings or roads.

Photo 3-6. Stabilized dune vegetation near the northwest coast of San Nicolas Island in 2009.

3.4.3 Vascular Flora

Approximately 273 vascular plant species have been documented on SNI (Junak 2008). Floristic relationships among the California Channel Islands have been examined and discussed by several notable botanists (see Raven 1967; Wallace 1985; Moody 2000; Oberbauer 2002). San Nicolas Island shares 86 percent of its native plants with the southern California mainland, 85 percent with the four northern Channel Islands, 84 percent with the other three southern Channel Islands, and 53 percent with islands off the Pacific coast of Baja California (Junak *et al.* 1996). Compared to the other seven Channel Islands, SNI has a relatively limited richness of native plant species and also has the highest percentage (51 percent) of introduced plant species. At least 141 taxa are considered to be introduced to SNI and most are native to the California mainland that were either intentionally or unintentionally introduced to SNI during the last 100 years. At least ten non-native plant taxa, which have become naturalized on SNI have not yet been reported on the other California Channel Islands (Junak 2008; see Appendix E).

Endemics

■ **See Section 3.8.2: Other Special Status Species, Table 3-4.**

Approximately 11 percent of the island's native vascular plant taxa are endemic to the Channel Islands, ranking it in the middle amongst other Channel Islands (Junak 2008). Two vascular plant taxa found only on SNI are the San Nicolas Island buckwheat (*Eriogonum grande* var. *timorum*) and the San Nicolas Island malacothrix. San Nicolas Island has no federally listed endangered or threatened plant species. Special-status plants on SNI include one state endangered, one state threatened, one state rare, and five considered sensitive by the CNPS.

3.4.4 Non-Vascular Flora - Microbiotic Crusts

Microbiotic crusts, or cryptogamic crusts as they have often been called, are arid land soil crusts consolidated by a combination of cyanobacteria, eukaryotic algae, fungi, lichens, and bryophytes. Microbiotic crusts well represented throughout the Channel Island and are often defined as a group of flowerless and seedless plants that reproduce by means of spores and included ferns, mosses, algae and fungi. Lichens are a fungus, usually of the class Ascomycetes, that grows symbiotically with algae, resulting in a composite organism that characteristically forms a crust like or branching

growth on rocks or woody surfaces. Liverworts are bryophytes of the of the phylum *Hepatophyta*, growing in wet places and resembling green seaweeds or leafy mosses. In many arid and semiarid areas of the world, soil surfaces are consolidated by complex communities consisting of microorganisms, lichens, and bryophytes. The physical structure of microbiotic crusts varies depending on climate, soil type, and the composition of the biological community. Biological soil crusts are known to have a variety physical form. Some crusts are flattened, polygonally cracked, and have a rough, undulating surface, while others are pedicellate and demonstrate a complex vertical microtopography. All soil crust communities contain some combination of cyanobacteria, bacteria, eukaryotic algae, and non-lichenized fungi. More structurally complex soil crusts contain some combination of lichens and bryophytes.

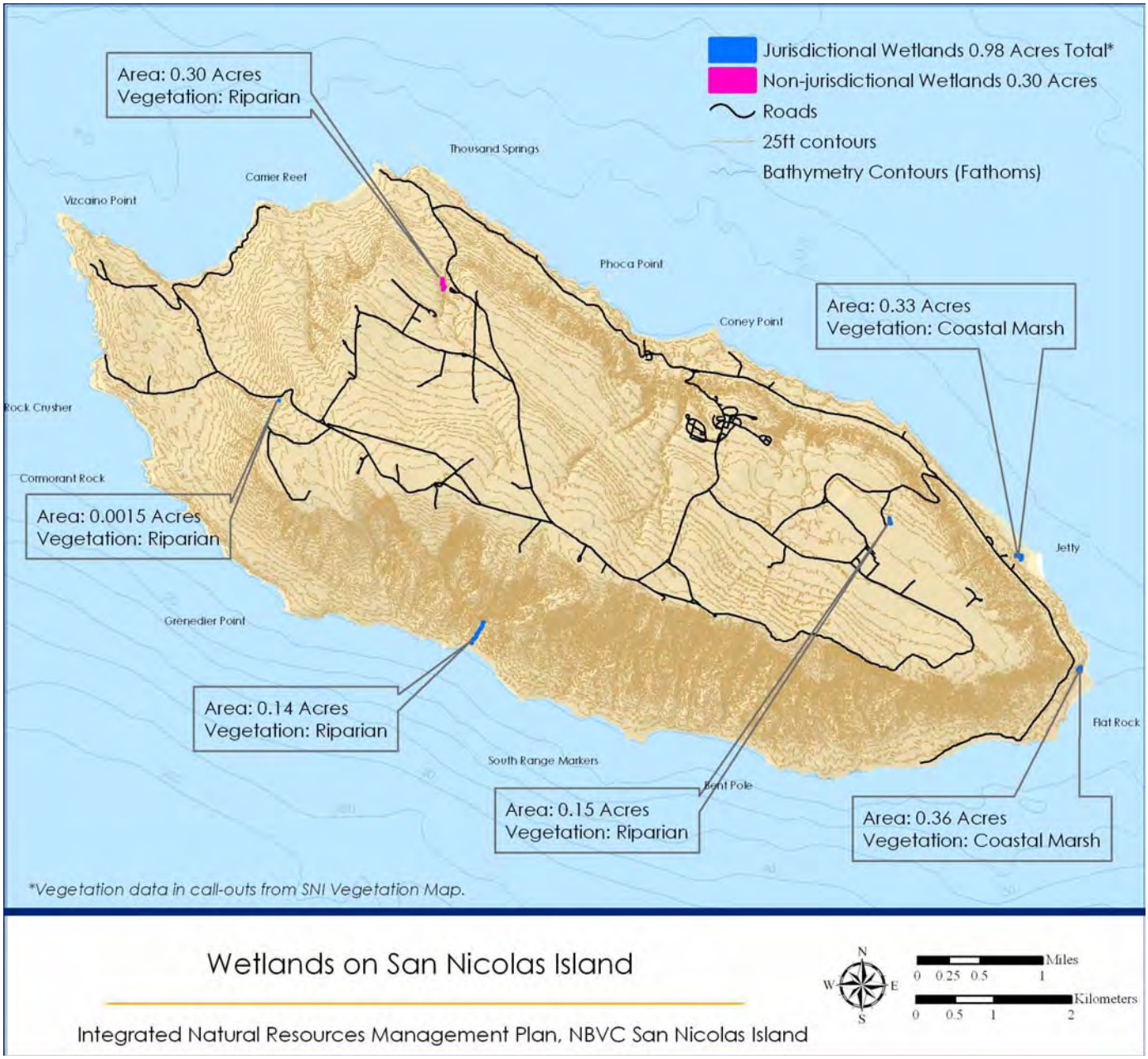
A growing body of data suggests that microbiotic crusts play several important ecological roles in arid and semiarid ecosystems. The most obvious and likely the most important role is stabilization of soil surfaces, which effectively controls and reduces erosion (Johansen *et al.* 1998). Lichens are the most conspicuous forms of non-vascular plants on the island, covering large rocky barren areas on the northeast slopes. Mosses and liverworts are found infrequently around seeps and springs, and in shady microhabitats. Borlander's moss (*Entosthodon bolanderi*) and California hard-stalk moss (*Scleropodium californicum*) represent the endemic Channel Island bryophytes present on the island, and two species of lichens *Niebla ramosissima* and *N. dactylifera* are found only on SNI. The historic diversity and abundance of SNI microbiotic crusts is not well documented and has likely been reduced to some extent from human occupation and grazing.

3.4.5 Jurisdictional Waters

The USACE delineated wetlands at SNI in December 2008 (USACE 2008). This delineation surveyed intermittent stream channels that discharge to the ocean, seeps, and a lagoon. This 2008 wetland delineation identified a total of 0.98 acres (0.4 ha) of jurisdictional wetlands on SNI, including riparian and coastal marsh habitats. The wetlands delineated by the USACE are identified in Map 3-5.

3.4.6 Long-Term Monitoring of Plant Communities

In 1993, the Navy contracted CINP to establish 36 vegetation sampling plots to evaluate long term plant community trends and contribute to the ongoing monitoring program taking place throughout the Channel Islands (see Map 3-4). The methods established for this program were consistent with those utilized on the other islands of CINP to enable the modeling of vegetation change throughout the Channel Islands. The goal of the project was to monitor the distinct assemblages of plant species and vegetation communities that developed on the island as a result of isolation from the mainland and other islands (Halvorson *et al.* 1996). From the Navy's perspective, "the objective of this project is to enable the Navy to make proper management decisions pertaining to the recovery of island plant communities" (from NAVFAC SW Scope of Work for 2009 monitoring). This comes from the recognition that SNI vegetation is in various stages of recovery from grazing, farming, military use, and introduction of invasive plant species. The monitoring program documents natural vegetation recovery by gathering and analyzing data on botanical composition, vegetation cover, and ground cover from the long-term sampling transects. Methods utilized to perform the long term monitoring as well as newly implemented methods were reviewed and reported in most recent vegetation monitoring report (Tierra Data Inc. [TDI] 2009).



Map 3-5. Jurisdictional wetlands on San Nicolas Island (USACE 2008).

Summary of 2009 Monitoring

Thirty-six of the 37 plots were resampled in 2009. Total vegetation cover in 2009 on all plots averaged approximately 64.2 percent, compared to over 80 percent in all previous samplings (TDI 2009). This was likely a result of the drought conditions that have prevailed on the island in recent years. This same trend held true for most vegetation communities, with lower average cover in 2009 than in previous years, but there were exceptions. On the grassland plots, vegetative cover in 2009 was lower than in 1995 and 1996, but was similar to 1993 and 1994. On stabilized dunes, vegetative cover in 2009 was somewhat higher than 1995-1996 and lower than 1993-1994. The greatest decline in vegetative cover was seen in the Isocoma/Baccharis scrub (68-97% cover in 1993-1998, only 33% cover in 2009) and Lupine Scrub plots (92-95% cover in 1993-1998, only 58% cover in 2009).

The percent cover of native and non-native plant species varies widely from one vegetation type to another (TDI 2009). Grassland plots have the highest overall non-native cover (67.4%) and lowest native/non-native ratio of 0.35. Lupine scrub plots also had a very low native/non-native ratio of 0.52. Coreopsis Scrub plots have the next highest percent cover of exotics, but a much higher native/non-native ratio of 0.85, with highest percent cover of natives. Most other vegetation types had nearly equal cover of natives and non-natives.

Over the long term, the percent cover of annual forbs has fluctuated greatly from year-to-year, while annual grasses increased over the first two years of the study before leveling off at around 60 percent between 1995 and 1998, followed by a sharp decline in 2009 (TDI 2009). In addition average shrub cover has remained fairly steady at around 25-35 percent since 1993. The fluctuations in annual forb cover tend to closely follow the annual rainfall patterns (TDI 2009), as might be expected.

3.5 Coastal and Marine Communities

The Channel Islands, including SNI, lie within the greater context of the SCB. The SCB is a 100,000-square-mile body of water and submerged continental shelf that extends from Point Conception, California, in the north to Cabo Colnett, Baja California, Mexico, in the south (Noblet *et al.* 2003). The SCB is subject to short-term and long-term temperature fluctuation, depending upon the strength or weakness of the ocean current systems (Dailey *et al.* 1993). The complex interactions related to the physical topography, current systems, and biological contributors manifested over eons has defined the richness and diversity of marine life in the SCB. Considering the SCB's isolated position at the confluence of two major ocean currents, marine communities garner significant contributions from these two distinct biomes. San Nicolas Island is situated along the outer (western) edge of the SCB, and is primarily influenced by the cold productive waters of the California current. Marine habitats and communities associated with SNI represent a wide variety of assemblages including similarities in terms of fish and algal diversity to northern regions like San Miguel Island and the central coast of California. The dominant invertebrate species resemble those prominent at neighboring Santa Barbara Island and SCI. The complex oceanographic conditions and circulation patterns associated with SNI contribute greatly to its species diversity and richness.

Overlaid on this range of habitats are temporal and spatial fluctuations in primary production that depend on nutrient supply from coastal runoff, seasonal upwelling, and long periods of sunshine. A depth gradient of marine habitats from coastal intertidal to deep benthic communities. Coastal cliffs, rocky intertidal habitat, sandy beaches, and small embayments make up the island's coastlines. The nearshore marine environment consists of offshore rocks and islets, rocky reefs, kelp forest, eelgrass beds, and soft (mostly sandy) bottom.

3.5.1 Sandy Beach

Sandy beaches dominate significant portions of SNI shorelines similar to Santa Rosa Island and the mainland. In contrast, only 20 percent of the shoreline of the other California Channel Islands are sandy beach, in comparison to 80 percent of the shoreline of the southern California mainland coast (Richards 2004). Macrophyte debris, primarily algal wrack, serves as a major source of energy for the beach communities. High depositional beaches, such as Redeye Beach and Tender Beach on SNI, face northwest into the prevailing winds and swell. Consequently, they receive large quantities of marine debris, carcasses, and macrophyte wrack, primarily giant kelp (*Macrocystis pyrifera*) (D. Lerma, *personal observation* [*pers. obs.*], 2009).

Key invertebrate fauna on sandy beaches are sand crabs (*Emerita analoga* and *Blepharipoda occidentalis*), bloodworms (*Euzonus mucronata)*, isopods (*Excirolana chiltoni*), beach hopper amphipods (*Megalorchestia* spp. [*Orchestoidea* spp.]), purple olive snails (*Olivella biplicata*), and Pismo clams (*Tivella stultorum*) (Morris *et al.* 1980). Surveys performed at SNI in support of an ASBS evaluation sampled several intertidal

and subtidal areas where sandy subtidal habitat was the dominant substrate, along the southeastern portion of SNI, including Coast Guard Beach, Sand Spit, and Daytona Beach. A qualitative survey of the area in the vicinity of the pier at Daytona Bach documented sand dollars (*Dendraster excentricus*) and purple olive snails as well as some common polychaete worms (e.g. *Diopatra* spp.). Common organisms typically present on coastal beaches were also reported, including beach hoppers and bloodworms. Kelp flies (*Coelopidae*), isopods, and beach hoppers occurred in association with kelp wrack. Noticeably absent were sand crabs, although sand crabs were observed at Daytona Beach during past surveys (L. Honma, *pers. obs.*).

Sandy beaches provide foraging and resting habitat for a number of shorebirds. Depositional beaches, exposed to prevailing winds and waves, tend to be the most productive beaches as a result of kelp wrack input; however, they are also the most vulnerable to an oil spill. Studies conducted at sandy beaches within the northern Channel Islands reported a direct relationship between amphipod abundance and macrophyte wrack cover (Lerma and Richards 2000; Dugan *et al.* 2000; Richards 2004). Infaunal invertebrates contribute to the overall productivity of beaches on multiple trophic levels.

Sandy beaches provide foraging and resting habitat for a number of shorebirds including snowy plover (*Charadrius alexandrinus*), black-bellied plover (*Pluvialis squatarola*), willet (*Tringa semipalmata*), whimbrel (*Numenius phaeopus*), long-billed curlew (*Numenius americanus*), gulls (Family Laridae), and sanderlings (*Calidris alba*). Invertebrates in wrack on the upper beaches attract black and ruddy turnstones (*Arenaria melanocephala* and *A. interpres*), dowitchers (*Limnodromus* spp.), and other shorebirds. Other birds observed at the sandy beaches are black oystercatchers (*Haematopus bachmani*), killdeer (*Charadrius vociferus*), song sparrows (*Melospiza melodia*), western gulls (*Larus occidentalis*), and western sandpipers (*Calidris mauri*). Snowy plovers nest on several SNI beaches; access to these areas is restricted during the nesting season. Pinnipeds haul out and breed on the majority of beaches.

3.5.2 Rocky Intertidal

The intertidal zone is the strip of shore ranging from the uppermost surfaces wetted during high tides to the lowermost areas exposed to air during low tides. The vertical extent of tidal range on SNI can be as high as 10 feet (3 m; +7.9 to 2.0 feet [+2.4 to -0.6 m]) during full or new moon periods. On surf-swept rocky cliffs, the wave splash can extend the marine influence upward another 16 feet (5 m) or more. Low slope rocky benches can result in intertidal regions tens-of-meters wide. Bottom substrate within SNI intertidal consists of sand, gravel, cobble, boulders, and bedrock.

The intertidal zone is unique among marine environments in that its inhabitants are regularly exposed to air and must be adapted to extremes of temperature and desiccation, and physical disturbance from waves and tidal action. For intertidal habitats, tidal characteristics represent the most important abiotic gradient at a given location (Dailey *et al.* 1993), though tidal characteristics and the subsequent periods of tidal immersion vary little from site to site at SNI. The abiotic parameters of greatest geographic importance appear to be (1) substratum characteristics, (2) surface water masses and accompanying temperature regimes, and (3) wave action (Dailey *et al.* 1993). Additionally, intertidal areas are subject to high degrees of physical disturbance from prevailing winds and waves depending upon aspect. The richness and complexity of intertidal life represent ecological niches from wave-swept open coasts to protected embayments, and span from the upper splash zone to the nearly continuously submerged lower intertidal. Site specific species diversity and abundance is dependent on the various degrees of biotic and abiotic interaction that sculpt the resulting biological communities.

Upper Intertidal. The organisms in this highest zone are most exposed to the air, staying wet mainly by wave splash. The dominant plants are lichens and cyanobacteria. Marine algae is somewhat limited in the high intertidal and consists of primarily green algae where water collects. Large numbers of periwinkles (*Littorina* spp.) graze on the algae as well as several species of limpet (*Acmea* spp.). Few marine predators occupy this area, but it is visited more frequently by land animals, such as shorebirds, foxes, and people. Variations in species diversity and presence/absence among locations vary widely based on the exposure to wave overwash and spray.

Middle Intertidal. This zone is covered and uncovered by the tides on a regular basis. The majority is dominated by lush marine algae and a broad host of invertebrate species including owl limpets (*Lottia gigantea*) and black abalone. The higher zones seem relatively barren by comparison with the teeming life of this mid-region, which is exceeded in density only by that of the outer tidelands (Ricketts *et al.* 1985). Two fucoid alga (*Selvetia* spp. and *Fucus* spp.) typically dominate this area as well as a diverse assemblage of red alga (*Chondracanthus* spp., *Porphyra* spp., *Prionitis* spp., among others). Considering the various exposure types incorporated within island locales, the invertebrate community can vary widely by site. Representational invertebrates of the middle-intertidal include anemones (*Anthopluera elegantisima*), limpets (*Collisella* spp., *Acmea* spp., etc), snails (*Tegula* spp.) and various sea stars.

Lower Intertidal. This zone is submerged most of the time. Plants that cannot tolerate desiccation grow profusely here. The lower intertidal is dominated by mussels (*Mytilus* spp.), gooseneck barnacles (*Pollicipes polymerus*), various seaweeds, including red, green and brown algae. Sea urchins, sea anemones, polychaetes, and snails are among the many small animals that live among the seaweeds. Most intertidal fishes live in this zone and include gobies, clingfishes, pricklebacks, and sculpins (*Cottoidae* spp.).

Soft Bottom Communities. Sand channels interspersed within rocky intertidal habitat support soft bottom communities similar to adjacent subtidal soft bottom habitat and provide important access points for foraging fauna. The sediment is constantly shifting in response to the waves and currents. Therefore, few plants and animals can attach themselves to the substrate, as they do in the rocky communities. Most of the resident animals burrow into the substrate, and seagrasses, with their more extensive system of roots and underground stems, can establish themselves in sheltered areas. The challenges of soft-bottom intertidal life are different than those of hard-bottom. Transient predators typically utilize intermittently submerged soft bottom habitat to forage and include a multitude of fish, invertebrates, birds, and marine mammals. Soft bottom communities can sustain high densities of invertebrate infauna including various bivalves, worms, and amphipods (sand crabs).

Intertidal surveys performed at four distinct sites in the winter of 2006/2007 reported a wide variety of invertebrates and algae including coralline algae, both geniculate and crustose forms, low-lying red algae (e.g. *Gelidium* spp., *Mastocarpus* [*Gigartina*] spp.) and erect red algae (e.g. *Pterocladia* sp., *Prionitis lanceolata*) present at all tidal elevations but most common at the +3 feet (+0.9 m) mean lower low water (MLLW) tidal level (Merkel and Associates Inc. 2007a). Invertebrates documented included several species of limpet (*Lottia gigantea*, *L. scabra*, *L. digitalis*), barnacles (*Balanus glandula*, *Chthamalus fissus*, and *Tetraclita rubescens*), littorine snails (*Littorina scutulata*), mussels (*Mytilus californianus*), and anemones (*Anthopleura elegantissima*, *A. sola*) among other species. Addtionally, long term black abalone studies established in the late 1970s are currently ongoing (VanBlaricom 1993) at several locations along the northeastern shore of SNI, yielding important information on population trends, disease resistance, and recruitment patterns.

3.5.3 Nearshore Waters

The nearshore waters throughout the Channel Islands are comprised of a variety of bottom types and associated biological communities based on the underlying substrate type and the dominant oceanic conditions. They are influenced by the cold California current and the California counter current, creating a rich assemblage of fish, invertebrates, macroalgae, and marine mammals comprised of species ranging from the northern Channel Islands to northern Baja Mexico. The shallow subtidal waters surrounding SNI are defined by -9.8 feet (-3 m) MLLW to approximately -30 m MLLW and are comprised of soft sand bottom, small low-lying patch reefs, and large high-relief rocky reefs. Habitats can be further subdivided into vegetated and unvegetated as well as into depth gradients.

Unvegetated Soft Bottom

Considering the expansive nature of the SCB and encompassed Channel Islands the majority of the nearshore habitat is unconsolidated (gravel, sand, or mud) sediments, hereafter referred to as soft bottom sediments. Benthic species can be epifaunal (attached or motile species that inhabit rock or sediment surfaces) or infaunal (those that live in rock or soft sediments). Nearshore unvegetated sandy soft bottoms support benthic invertebrates and fish in a vertically stratified pattern. In shallow waters the benthic epifauna are dominated by suspension feeders, giving way to primarily carnivores and scavengers below 33 feet (10 m). The segregation of species by depth within the soft bottom habitat is likely attributed to the ability of suspension feeders to avoid predation by residing in the harsh physical environment characterized by strong wave action. Moving deeper, the epifaunal densities decrease while the infaunal densities increase (Barnard 1963), probably because of the greater stability of the sediment. The zonation along the complex depth gradient that is apparent for higher taxa and trophic groups is also found within genera (Dailey *et al.* 1993).

The intricate interactions among individual species and the physical environment provide a multitude of niches from the shore to deep offshore areas. Unvegetated soft bottom habitat allows larger predatory invertebrates (crabs and starfish) and fish to take advantage of expansive foraging areas within a mostly homogeneous habitat.

Vegetated Soft Bottom

Vegetated soft bottoms, primarily eelgrasses (*Zostera spp.*), are widely distributed in the temperate and cold waters of the Pacific and occur mostly within shallow protected coastal waters and embayments. Sometimes exposed at low tide and occurring as deep as 98 feet (30 m) eelgrass communities are important biological habitats common throughout the SCB and the Channel Islands. Eelgrasses can grow into thick luxuriant beds that rank among the most productive communities in the ocean (McRoy and McMillan 1977). Their roots and stems help stabilize the soft bottoms, and their leaves reduce wave action and currents. Reduction of turbulence causes greater and finer sediment deposition, thus affecting colonization by other organisms. The structural complexities of eelgrass beds in conjunction with the diverse assemblage of organisms that inhabit them benefit multiple trophic levels.

Information regarding the distribution of eelgrass habitat within SNI waters is limited and only one location, at Coast Guard Beach, has been documented to support a persistent community (Engle and Miller 2003), though additional eelgrass communities may occur within other protected areas along the southeast side of the island. Eelgrass communities are characterized as submerged aquatic vegetation (SAV) that affords it special status and protection under federal statues and defines the habitat as a special aquatic site. Protecting and understanding this habitat is important because various invertebrate and fish species depend on eelgrass beds as essential foraging sites and nursery grounds. Wyda *et al.* (2002) demonstrated a significantly higher abundance, biomass, and species richness of fish assemblages within sites that have high levels of eelgrass habitat complexity, compared to sites without any eelgrass. The dense eelgrasses offer shelter to many invertebrates otherwise exposed to predation, stabilize sediment erosion, and supply important nutrients from detritus material.

Rocky Reefs and Kelp Forests

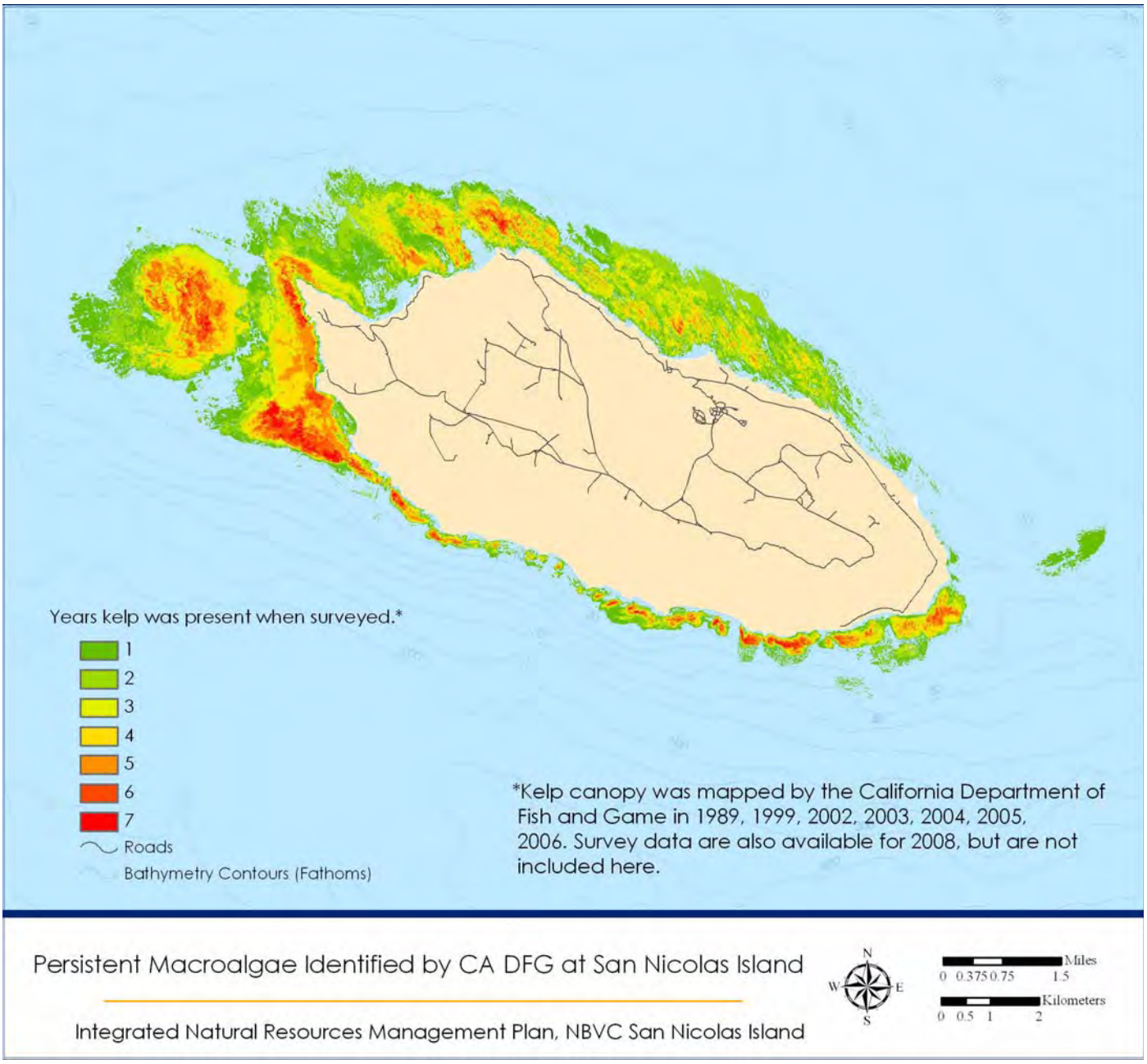
Hard bottom portions of the continental shelf are usually just submerged extensions of rocky shores. These communities are generally rich and productive; their most obvious feature is the abundance of seaweeds. Unlike eelgrasses, which have true roots and can absorb nutrients from the sediments, seaweeds must depend on nutrients dissolved in the water. One of the main problems for seaweeds in this environment is finding a place to attach. Different seaweeds are adapted to different temperature, light, and grazing regimes. They also vary in their life history strategies. Some species grow fast but only for a short time, while others grow more slowly and live longer.

Forests of the macroalgae giant kelp sustain one of the most diverse, productive, and dynamic ecosystems on the planet (Mann 1973; Dayton 1985; Barnes and Hughes 1988; Graham *et al.* 2003). In southern California alone, over 200 species of algae, invertebrates, fishes, and mammals are commonly observed within giant kelp forests (North 1971; Foster and Schiel 1985). The distributions of many of these organisms are known to be linked tightly to the presence of giant kelp, due to a variety of trophic and habitat associations (see examples in North [1971] and Foster and Schiel [1985]). Kelp forests are diverse, structurally complex and highly productive components of cold water rocky marine coastlines (Steneck *et al.* 2002). Unlike eelgrasses, seaweeds are also subject to a greater number of grazers. Perhaps the most important herbivore in this community is the sea urchin. Chitons, sea hares, limpets, and abalones are also important grazers. As in soft-bottom communities, grazers and their predators have a strong influence on composition as they remove residents from the rocks and open space for other organisms.

San Nicolas Island kelp forests (Map 3-6), are well distributed within the nearshore waters and display temporal and spatial variability between years based on oceanographic circulation, growth conditions, and grazing pressure. The competitive dominant, the canopy-forming giant kelp, has the highest productivity and biomass per square meter (reviewed by Foster and Schiel [1985] and North [1994]). Subtidal surveys performed at four separate sites around SNI, as part of an ASBS evaluation, documented giant kelp and other understory kelps present in the subtidal zone at various life stages (USDON 2007). A highly diverse nonkelp macroalgal group was also documented along the intertidal rock crevices and was represented by a variety of species of brown, green, and red algae. These kelp and nonkelp macroalgae support a detrital pool that represents a trophically important conduit of fixed carbon into the food web; giant kelp is generally the dominant contributor of macroalgae based phytodetritus in this system (Zobell 1971; Gerard 1976; Harrold and Reed 1985).

San Nicolas Island kelp forests occupy a physically challenging environment and subsequently contribute significant quantities of wrack (drift algae), that break off and disperse, throughout the subtidal marine environment. Drift algae is a important because it provides food to abalone and other grazers that are limited in their ability to directly graze on the highly nutritional fronds of adult giant kelp plants located near the surface. Abalone, specifically red abalone, black abalone, and white abalone are species of special concern throughout their range because of protection status and historical value as commerical fisheries black and white abalone are discussed in depth later in this section. Red abalone located in the nearshore waters surrounding SNI represent an important portion of the population located south of Point Conception and are the largest of all abalone species.

The importance of kelp bed density, distribution, and species composition to fish abundance is well documented (Carr 1994; Hamilton 2004). Although the persistence and stability of kelp beds are at least partly determined by suitable space and substratum type (Dayton 1985), the importance of overall habitat complexity (i.e. kelp cover and substrate topography) to kelp-associated fish species is well understood. Hamilton and Konar (2007) found that structural habitat complexity is important to both fish and kelp in that greater physical habitat complexity is associated with greater overall densities of fish in these communities. Fish diversity and biomass increases with structural complexity of the bottom and attached macroalgae. Trophic contributions from rocky reef and kelp forests to the overlying nearshore waters are directly responsible for the associated high species diversity and the cascading support to every trophic level, specifically marine mammals and sea otters. Though substantial portions of the subtidal rocky habitat lie beyond kelp forest depth they provide equally important productivity contributions to various habitats within the nearshore ecosystem.



Map 3-6. Macroalgae identified by the California Department of Fish and Game at San Nicolas Island.

3.5.4 Offshore Rocks

Offshore rock outcrops are important habitat for many species of plants and wildlife. San Nicolas Island and adjacent nearshore waters encompass a wide variety of offshore rocks that provide important habitat to resident and migratory marine, terrestrial, and avian wildlife.

The majority of SNI offshore rocks are small in size, close to the island and of low elevation. Many are composed of exposed rock, washed by active seas. A small but important minority is large enough to have soil and low vegetation.

The offshore rocks and sea stacks are unique habitats that provide protected breeding sites for thousands of migrating seabirds and marine mammals. Remote, undisturbed offshore breeding sites are extremely important for seabird species (USFWS 2005). Due to their isolation from the mainland and relative inaccessibility to the islands, offshore rocks serve as prime sanctuaries for birds and marine mammals. The largest rocks host a small complement of plants and often breeding seabirds. Some smaller rocks have seabird nesting sites as well; isolated pairs of black oystercatchers, pelagic cormorants (*Phalacrocorax pelagicus*), and pigeon guillemots (*Cepphus columba*) will use such suitable sites. Many rocks that are over washed during high tide and heavy sea events are important feeding sites for black oystercatchers and a suite of wintering and migrating shorebirds such as black turnstones, rock sandpipers (*Calidris ptilocnemis*), surfbirds (*Aphriza virgata*), wandering tattlers (*Tringa incana*), and whimbrels (MRB 2002).

San Nicolas Island and adjacent offshore rocks provide breeding habitat for several seabird species, including: the black oystercatcher, Brandt's cormorant (*Phalacrocorax penicillatus*), and western gull (USDON 2005a). Gulls and cormorants seasonally establish large breeding colonies on the west end of the island. California brown pelicans *(Pelecanus occidentalis californicus*) and the three species of cormorants utilize the offshore rocks as a primary roosting and foraging location. San Nicolas Island has one of the largest Brandt's cormorant breeding colonies in California estimated at 5,000 breeding pairs in 2006 (Capitolo *et al.* 2007).

Underwater, the offshore rocks contain similar intertidal and subtidal communities previously described in this section. Considering the isolated nature and physical factors affecting offshore rocks within the nearshore waters of SNI, the associated biological communities are essentially islands within themselves. Invertebrates including bivalves (mussels, scallops, etc), echinoderms (starfish and urchins), and other invertebrate families benefit from the continual inundation of cool productive water to promote growth. Some invertebrate species, primarily mussels and scallops, grow in high densities and to a larger size due to the lack of predators that result from the rock's spatial isolation. Fish congregate near offshore rocks and structures to take advantage of food and protection from predation associated with such structures. Therefore, offshore rocks contribute to the richness of both terrestrial and marine systems on multiple trophic levels and play an important role in sustaining sensitive island populations.

3.5.5 Protected Habitats

No critical habitat designations, as defined under the ESA, occur for SNI. However, snowy plover critical habitat was proposed on SNI, but not designated due to the INRMP which afforded protection of habitat under the military exemption under the NDAA.

For information on Jurisdictional Waters of the U.S. refer to *Section 4.3.2: Jurisdictional Waters - Wetlands*.

No MPAs currently exist in the vicinity of SNI but CDFG and USDOD are currently coordinating efforts through the development of INRMPs to propose various alternatives that would establish a State Marine Reserve at Begg Rock in order to support the MLPA. For more information regarding these MPAs refer to Appendix B, *Section B.4: California State Laws*.

3.6 Terrestrial Wildlife Populations

Evaluating trends in important fish and wildlife species within a defined boundary while prioritizing species in need of conservation attention is an essential step in developing appropriate management strategies and allocating limited financial or human resources. Although many globally threatened species have been identified through standardized ranking systems (e.g. International Union for Conservation of Nature [IUCN] Red List, MBTA), the burden of identifying priority species at smaller geographic scales often falls on agencies or institutions operating within political boundaries much smaller than the geographic ranges of most species. Species within

a region can be assessed using two important factors: (1) scale (globally or locally) at which the level of risk is applied and (2) the biological capacity of a region to contribute towards sustaining populations of a species based on the proportion of the global or regional population. For example, the species diversity of vascular plants within the Channel Islands is low compared to mainland areas of similar size while edemnism is relatively high (Junak *et al.* 1996; Junak 2003, 2008). Island ecosystems are insular systems that highlight important interspecies relationships and create defined niches and habitats sometimes exclusive to specific regions or islands.

3.6.1 Invertebrates

Relatively few surveys have been conducted on insects and related terrestrial arthropods on SNI. Nevertheless, over 200 species have been documented (Appendix E). Based on the best available data, over a dozen taxa of insects found on SNI are considered endemic specifically to SNI or to the Channel Islands. However, it may be premature to draw conclusions from these data because (1) some of these supposed endemics may eventually prove not to be, and (2) some endemics have not been described and others have probably not yet been collected or recognized in collections (Miller and Menke 1981). Many of the native pollinators may have co-evolved with island endemic flora and be important to habitat and rare plant management.

The status of most invertebrate species on SNI has been largely overlooked with the exception of the land snail fauna that is fairly well understood and particularly rich. Invertebrates play ecologically crucial roles in the terrestrial ecosystem and are important food items for many birds, small mammals, and lizards. As pollinators, insects are vital to the reproduction of many island plant species and are also essential for decomposition and soil formation processes. Insects of the Channel Islands are typically associated with mainland forms but differences in insect assemblages exist between the northern and southern Channel Islands. The southern islands tend to have higher numbers of California endemics and greatest affinity with insects of more arid climates, such as the southern coastal and foothill habitats and the desert environs of the Mojave and Colorado deserts (Powell and Hogue 1979).

Thirteen species of snails have been documented on SNI (Appendix E). Perhaps the rarest land snail is the San Nicolas island snail (*Micrarionta feralis)*, its entire global range limited to one small cactus patch on SNI. The prickly-pear island snail (*Micrarionta opuntia)*, Santa Barbara shelled slug (*Binneya notabilis)* (known only from recent fossil records), and bicolor cactus snail (*Xerarionta tryoni)* are also SNI endemics (USDON 2005a). Other Channel Island endemics found on the island include Durant's island snail (*Haplotrema duranti)*, pouch snail (*Physa virgata)*, San Clemente Island blunt-top snail (*Sterkia clementina)*, and the California vertigo snail (*Vertigo californica)*. At least two introduced non-native snail species, the European garden snail (*Helix aspersa*) and the decollate snail (*Rumina decollata)* are present on the island (USDON 2005a). The decollate snail is a relatively large snail which preys on other mollusks and hence may pose a serious threat to the small remnant populations of terrestrial land snails on SNI.

3.6.2 Reptiles and Amphibians

Only three reptiles are known to occur on SNI, the southern alligator lizard (*Elgaria multicarinata*), sideblotched lizard (*Uta stansburiana elegans*), and the federally threatened island night lizard (*Xantusia riversiana*). The island night lizard is discussed in *Section 3.8.1: Federally Listed Species and Critical Habitat.* Alligator lizards and sideblotched lizards are presumed to have been introduced to the island in recent historical time. The distribution of both species on SNI is limited, but ranges have been gradually increasing. No amphibian species are currently documented to occur on SNI.

Alligator lizards are members of the family Anguidae, a family of lizards found in the Americas, Europe, Asia, and Africa. Alligator lizards are generally secretive, tending to hide in brush, under rocks, and human introduced debris, although they are often seen foraging out in the open or on roads in the morning and evening. The southern alligator lizard eats a variety of small invertebrates, small lizards, small mammal and occasionally on bird eggs and young birds (Stebbins 2003).

The sideblotched lizard is the most abundant and commonly-seen lizard in deserts and semi-arid areas. Diurnal in nature this lizard is usually the first species out in the morning due to its small size and is active mostly on the ground, but it is also a good climber (Stebbins 2003). No estimates of abundance are available.

3.6.3 Birds

San Nicolas Island provides nesting, roosting, and foraging habitat for over 300 species of birds including resident and migratory birds (Appendix E).

Landbirds (Passerines)

Passerines (including songbirds) are bird species that are small, often live near the ground, and have appendages adapted for perching. Migration for passerines is predominantly over land. They rarely are seen over open water. The Passerine order of birds encompasses more than half of all bird species and inhabits a variety of land cover types including forest, scrub, riparian, and coastal habitats. Table 3-2 lists the landbird species that nest on SNI.

Table 3-2. Landbird species nesting on San Nicolas Island.

Species (Scientific Name)	San Nicolas Island Status
American kestrel (*Falco sparverius*)	Resident, common
barn swallow (*Hirundo rustica*)	Summer visitor, rare, known to breed on SNI
barn owl (*Tyto alba*)	Resident, uncommon
chukar (*Alectoris chukar*)	Resident, abundant
European starling (*Sturnus vulgaris*)	Resident, abundant
horned lark (*Eremophilia alpestris insularis*)	Resident, abundant
house finch (*Carpodacus mexicanus clementis*)	Resident, abundant
house sparrow (*Passer domesticus*)	Resident, uncommon
northern mockingbird (*Mimus polyglottos*)	Resident, common
orange-crowned warbler (*Oreothlypis celata sordida*)	Summer visitor, abundant
rock wren (*Salpinctes obsoletus*)	Resident, common
western meadowlark (*Sturnella neglecta*)	Resident, abundant

Resident landbirds on SNI are defined as such dependent upon the amount of time the species spends; they are typically present year round and breed on SNI. These species include three Channel Island endemics: the island horned lark (*Eremophila alpestris insularis*), San Clemente Island house finch (*Carpodacus mexicanus clementis*), and orange-crowned warbler (*Oreothlypis celata sordida*), as well as the western meadowlark (*Sturnella neglecta*), rock wren (*Salpinctes obsoletus*), and northern mockingbird (*Mimus polyglottos*). Northern mockingbirds are year round residents that are often found within developed areas. Twenty species regularly breed on the island including three non-natives, the house sparrow (*Passer domesticus*), European starling (*Sturnus vulgaris*), and chukar (*Alectoris chukar*). Of the bird species breeding on SNI, the western snowy plover (*Charadrius alexandrinus nivosus*) is the only species that has special status under state and/or federal law. The western snowy plover is discussed in further detail in the special status species sections.

Island horned larks are ground dwelling birds of open habitats that prefer short height vegetation interspersed with bare ground. Breeding season for the San Nicolas Island horned lark is slightly earlier than in the mainland population. Island horned larks are locally common on SNI, and much of the island consists of sparsely vegetated areas of the type horned larks use for breeding and foraging with the exception of steep slopes and dense vegetation (Wehtje 2000).

San Clemente Island house finches are quite common on SNI and are year-round residents. These finches are very adaptable and have increased their range in the last 60 years (Wehtje 2000). The primary limiting factor on SNI is access to safe breeding sites. Wehtje (2000) indicates the presence of large numbers of nests at the main compound on SNI may suggest that good nesting sites in native vegetation are lacking. House finches range all across SNI and are not affected by most human activities.

A third SNI endemic, the dusky orange-crowned warbler, is a migrant that breeds on all of the California Channel Islands, and is associated with tall vegetation. During the breeding season, these warblers are most common in Giant Coreopsis Scrub, but Coyote Brush Scrub and deep drainages will also support them. This warbler's breeding cycle is strongly correlated with winter rains and as soon as the island begins to dry out, the birds depart typically in May.

■ **Western meadowlarks are a California Partners-In-Flight focal species for monitoring grasslands.**

Western meadowlarks breed on SNI wherever the grass or scrub is sufficiently dense. They do not breed in tall vegetation nor on bare ground. They are a California Partners-In-Flight (PIF) focal species for grasslands.

In California, rock wrens are found throughout the state except along the coastal belt north of Marin County. On SNI, rock wrens are common in areas of exposed soil or rock in combination with cracks and cavities where they might breed (Wehtje 2000). Island-wide point counts in 2000 showed a very strong correlation between steep slopes with bare soil and rock wren presence (Wehtje 2000). Dense vegetation is the most limiting factor for this species.

The northern mockingbird has greatly expanded its range and breeds almost contiguously throughout the U.S. and Mexico. On SNI, northern mockingbirds appear tied to the presence of fruiting shrubs, especially myoporum (Wehtje 2000). As a result, the majority of mockingbird territories are located on the main compound which uses myoporum for landscaping and windbreaks. The population is stable and is primarily limited by lack of suitable habitat and nest vulnerability to high winds.

In 1968, the CDFG introduced 85 chukar to SNI in order to develop a source population to restock mainland populations and establish a recreational hunting program for Navy personnel. By the time a sizable population was established, the Navy's mission had increased and personal firearms were no longer allowed on the island. Current population numbers for chukar are unknown but are estimated in the thousands (USDON 2005a).

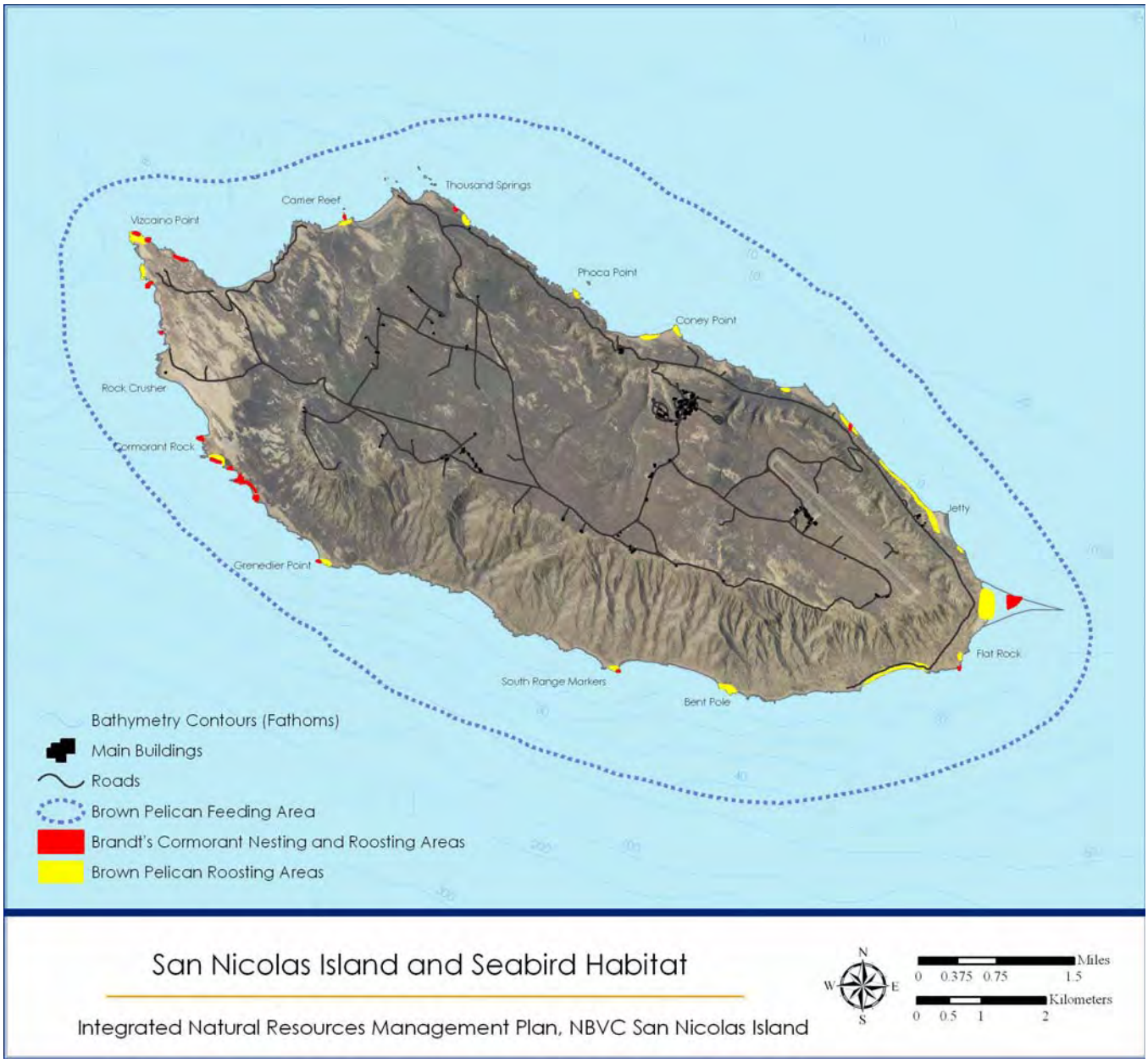
Raptors are uncommon visitors to SNI, with the exception of American kestrels (*Falco sparverius*) and barn owls (*Tyto alba*), which are permanent residents. Additional raptors previously observed on SNI include rare occurrences of transient and wintering visitors including sharp-shinned hawks (*Accipiter straitus*), Cooper's hawks (*Accipiter cooperii*), peregrine falcons (*Falco peregrinus*), merlins (*Falco columbarius*), and other extremely rare raptors (see Appendix E for a full list). Kestrels are documented predators of western snowy plovers and island night lizards. SNI sustains a regular wintering population of burrowing owls (*Athene cunicularia*), which is considered a California Species of Special Concern.

Although most resident species are adapted to the arid island conditions, neo-tropical migrants rely on the limited riparian areas and water sources for food and shelter. San Nicolas Island has a multitude of migrant bird species that visit throughout spring and fall migration. As some of the migration routes can be varied seasonally, there is a flux in the species diversity on the island when comparing spring versus fall migration. Refer to Map 3-7 for important locations utilized by migratory land birds at SNI.

Shorebirds

■ **The western snowy plover's use of SNI is described in more detail under *Section 3.8.1: Federally Listed Species and Critical Habitat*.**

Shorebirds are closely associated with wetland and coastal environments. They utilize beaches, estuaries, wetlands, coastal dunes, islands, and mudflats for nesting, foraging, and as stopover sites during migration. San Nicolas Island beaches support a variety of winter and summer visiting shorebirds including willets, yellowlegs, wimbrels, curlews, godwits, and turnstones among others. San Nicolas Island is also the home to several species of plover including the federally endangered western snowy plover.



Map 3-7. Areas commonly used by seabirds on San Nicolas Island.

The black oystercatcher is a long-lived monogamous shorebird that is completely dependent upon the marine shoreline for food and nesting (Andres and Falxa 1995). It is a locally distributed resident on the west coast of North America south to Laguna San Ignacio, including offshore islands (Jehl 1985). Breeding pairs establish well-defined breeding and foraging territories and will occupy the same territory for years. The American oystercatcher (*Haematopus palliatus*) and black oystercatcher are present year round on SNI and the black oystercatcher has been documented to breed on rocky shelf areas. The dominant prey items of the oystercatchers are mussels and limpets along the rocky intertidal. During the winter, the oystercatcher will often leave their territories and form a large flock in areas of high mussel density (Andres and Falxa 1995).

Seabirds

Seabirds are those species of birds that have adapted to the marine environment and spend a large portion of their life at sea. Coastal habitats and productive offshore waters are important nesting and foraging areas for breeding and migratory seabirds. The most numerous groups of seabirds within the SCB are shearwaters, storm petrels, phalaropes, gulls, terns, and auklets.

Many of the seabirds roost on islands and offshore rocks around the Channel Islands. The Channel Islands offer nesting sites, some of which have extremely scarce suitable habitat elsewhere in southern California. These offshore islands are readily available to ocean birds and provide protection from human disturbance and predation. The Northern Channel Islands (San Miguel, Santa Rosa, Santa Cruz, and Anacapa) contain the majority of seabird breeding colonies considered special status. Map 3-7 shows some sites that have been identified on SNI as areas commonly used by resident and migratory seabirds.

Several seabird species are considered particularly important here because of their large numbers, their limited ranges, the rapid decline in numbers, or their use of unique habitats. Of the 48 seabird species known to occur on or near SNI, several are under the listing authority of the ESA (Table 3-6). One species is a candidate for federal listing (Xantus's murrelet [*Synthliboramphus hypoleucus*]), and nine species have either or both state and federal Species of Special Concern listing (ashy storm-petrel [*Oceanodroma homochroa*], black storm-petrel [*Oceanodroma melania*], black skimmer [*Rynchops niger*], Caspian tern [*Sterna caspia*], Cassin's auklet [*Ptychoramphus aleuticus*], elegant tern [*Sterna elegans*], Layasan albatross [*Phoebastria immutabilis*], pink-footed shearwater [*Puffinus creatopus*], and royal tern [*Sterna maxima*]). Of the 11 species listed as Birds of Conservation Concern (BCC) (USFWS 2008), four have active breeding populations within the SCB (ashy storm-petrel, Xantus's murrelet, California brown pelican, and Cassin's auklet), two are extremely rare transient (Layasan albatross and black storm-petrel), four utilize primarily bay and estuarine habitat adjacent to the SCB (Caspian terns, elegant terns, royal terns, and black skimmers) and one is a summer visitor (pink-footed shearwater).

Cormorants

Cormorants are considered coastal rather than oceanic birds, with some having colonized inland waters. This type of seabird is a colonial nester, using trees, rocky islets, or cliffs. Cormorants are primarily piscivorous with at least 93 species of fish from 43 families documented in their diet (Wallace and Wallace 1998), but they are also observed foraging upon cephalopods and other invertebrates. All three species occurring within the SCB have significant breeding populations within the Channel Islands located on rocky headlands and isolated offshore rocks.

Pelagic cormorants have a similar distribution to Brandt's cormorants. They breed along the coast and islands from the Chukchi and Bering Seas south to Japan and northern Baja California. They are the smallest of the North American cormorants and the least gregarious, forming colonies of less than 100 birds per colony on steep cliffs (USFWS 2005). California maintains about 14,300 pelagic cormorants (5% of the North American population) (USFWS 2005).

Overall, numbers of cormorants have increased in southern California, but regional populations have suffered from gill net and oil-spill mortality as well as human disturbance at several colonies. Pacific coast colonies fluctuate annually, with low reproduction and population numbers influenced by El Niño events (Ainley and Boekelheide 1990). Populations of both pelagic cormorants and Brandt's cormorants appear stable although comprehensive surveys of their entire range are lacking. In addition to the Brandt's cormorant colony, SNI maintains a small breeding population of pelagic cormorants.

Other Seabirds

Alcids are marine birds with a stout bill, short wings and tail, webbed feet, a large head and heavy body, and thick, compact plumage. Confined to the northern parts of the Northern Hemisphere, alcids include auklets, guillemots, murres, and puffins. True seabirds, they come to breed in large colonies and then disperse to the open ocean for most of their lives. Important southern breeding colonies historically occurred on the Channel Islands of California, and continue to exist at mostly unknown levels.

Auklets and murrelets documented to occur on SNI reflect avian species that may occur in adjacent offshore waters but have not been documented to breed on the island. Seven species are represented in this group including two extremely rare wintering species: the common murre (*Uria aalge*), parakeet auklet (*Aethia psittacula*), and one extremely rare transient tufted puffin (*Fratercula cirrhata*). The two most most important rare resident species include the Cassin's auklet and rhinoceros auklet (*Cerorhinca monocerata*). Additionally, two rare perennial visitors, the Xantus's murrelet and pigeon guillemot are uncommonly observed utilizing the nearshore waters adjacent to SNI.

Gulls represent a common and recognizable family of seabirds primarily known as ground-nesting carnivores which will take live food or scavenge opportunistically. Ten species of gull have been documented on SNI with eight of these wintering here. Only one species, the western gull is an abundant year-round resident that breeds on SNI. All gull species and their corresponding abundance and seasonal use of SNI are listed in Appendix E.

Grebes and loons are primarily uncommon transients on SNI with the exception of western grebes (*Aechmophorus occidentalis*) which are common winter residents. All three species of loons known to occur at SNI are migratory visitors and breed in northern latitudes. On SNI, all three of these have been known to winter on the island. The Pacific loon (*Gavia pacifica*) and common loon (*Gavia immer*) are extremely rare summer visitors.

Terns and skimmers are fast flying pelagic foragers transiting great distances between summer and wintering areas. The majority of tern species hold special status at either the state or federal level. Caspian terns are federal listed as Birds of Conservation Concern, while elegant terns are listed as Birds of Conservation Concern at both the state and federal level. Royal terns have state listing as California Birds of Conservation Concern. On SNI, only royal terns are common winter visitors. Caspian terns, Forster's terns (*Sterna forsteri*), and elegant terns are rare visitors to the island during migration or foraging trips. Black skimmers are considered rare within the SCB. The western population breeds in southern California. During the last three decades, black skimmers have become increasingly common along the southern California coast. They are extremely rare transient migrants at SNI.

Storm-petrels are the smallest of seabirds and feed on planktonic crustaceans and small fish picked from the surface, typically while hovering. Storm-petrels have a cosmopolitan distribution, found in all oceans. They are strictly pelagic, coming to land only when breeding. In the case of most species, little is known of their behavior and distribution at sea. Storm-petrels nest in colonies on remote islands which are attended nocturnally to avoid predators (Bretagnolle 1990). Petrels typically show a high degree of tenacity to the same nest from year to year; once pairs are established, they would likely continue to breed at the same sites. Several species of storm-petrels are threatened by human activities (IUCN 2010). All three species documented to occur on SNI are considered extremely rare transients according to data collected by the San Barbara Museum of Natural History in 2000.

Shearwaters are medium-sized, long-winged seabirds most common in temperate and cold waters. Shearwaters come to islands and coastal cliffs to breed. They are nocturnal at the colonial breeding sites, preferring moonless nights to minimize predation (Sibley 2001). Outside of the breeding season, they are pelagic (frequent the open waters) and most are long-distance migrants. Four species of shearwater have been documented to occur at SNI primarily utilize offshore and coastal waters foraging along upwelling boundaries. The sooty shearwater (*Puffinus opisthomelas)* is common in both the spring and fall and the pink-footed shearwater is a common summer visitor.

A full list of observed avian species is presented in Appendix E.

3.6.4 Mammals

San Nicolas Island has only two endemic terrestrial mammals, the San Nicolas Island fox (*Urocyon littoralis dickeyi*) and the San Nicolas Island deer mouse (*Peromyscus maniculatus exterus).* The San Nicolas Island fox and the San Nicolas Island deer mouse have evolved into separate subspecies unique to SNI. These two native species of terrestrial mammals warrant special consideration and are discussed in *Section 3.8: Special Status Species* . Bats appear to be rare on SNI: with a few recent observations due to efforts to determine bat use of the island, as well as to provide data for a wind energy project.

There are six subspecies of island fox, each of which is native to a specific Channel Island, and which evolved there independently of the others. Foxes from each island are capable of interbreeding, but have genetic and phenotypic distinctions that make them unique. The foxes are believed to have "rafted" to the northern islands between 10,400 and 16,000 years ago (Wayne *et al.* 1991a,b). Initially, fox populations were located on the three northern islands, which were likely easier to access during the last ice age—when lowered sea levels united four of the northernmost islands into a single mega-island (Santa Rosae) and the distance between the islands and the mainland was reduced. It is likely that Native Americans brought the foxes to the southern islands of the archipelago, perhaps as pets or hunting dogs (Collins 1991 a,b). The San Nicolas Island foxes established themselves as an independent group about 2,200 years ago (Wayne *et al.* 1991a,b). Currently the San Nicolas Island fox is a state threatened species and is covered in depth in *Section 3.8: Special Status Species* .

The deer mouse (*Peromyscus maniculatus*) is the most numerous and widespread small mammal on the California Channel Islands. Deer mice are the only small mammals on SNI, both currently and historically. The island deer mice are larger than typical mainland deer mice, and differ in other aspects of measurements and coloration (von Bloeker 1967, Gill 1980). In the past, the deer mice on each of the Channel Islands have been described as separate subspecies, and the named subspecies on SNI is *P. maniculatus exterus* (von Bloeker 1967).

Deer mice on SNI occur across the entire island, in all habitats. They are typically most numerous in shrub-dominated habitats, such as the large Coreopsis stands on the island. Relative abundance of deer mice on SNI (number of individuals per 100 trap-nights) ranges from lows of 20 to highs of 90 (unpublished monitoring data from SNI, 2005-2010). Compared to some of the other islands, numbers on SNI are moderate, with neither the very high numbers nor the extreme fluctuations seen on Santa Barbara Island (Drost and Fellers 1991).

Deer mouse breeding is in the spring on SNI, corresponding to the flush of plant growth following the winter rains. Pregnant and lactating females, and juvenile and subadult mice, have been recorded throughout April and May, but have not been recorded in the fall (unpublished monitoring data). Because of this seasonal breeding pattern, numbers are typically higher in the fall, and lower in the spring. Deer mice on the Channel Islands eat a variety of seeds, fruit, and insects and other invertebrates, and in turn are preyed on (on SNI) by barn owls, American kestrels, other birds of prey, island foxes and (formerly, at least) feral cats. The deer mice on SNI have not been found to carry Hantavirus, the causative agent of the serious and often fatal respiratory disease in humans (Orrock and Allan 2008).

Historically, the only introduced terrestrial mammal was the feral cat which has long been established on SNI and has posed a serious risk to the integrity of various avian and reptile species. Feral cats have been well documented to be responsible for the extinction of many mammal and bird species worldwide, especially within island ecosystems (see Lever 1985; Wolf 2002; Keitt *et al.* 2005). Cats were introduced to SNI in historic times, probably originally as pets but later possibly for pest control. It is not known when the feral population became established, but Hillinger (1958) reported that large numbers of feral cats were roaming the island by the late 1950s. The size of the population likely fluctuates over time in relation to prey availability and other factors. After the extensive cat trapping effort in 2009 and early 2010 and since the removal of two cats at the end of June 2010, there has been no detection of additional cats during over 3,000 camera trip nights or their sign in over 270 km of sign search

(Edmund Pert, *pers. comm.* 2010). After all cats are assumed to be removed, monitoring will be in place to confirm success with this specific removal effort. Future monitoring to ensure identification of potential re-introduction of cats and other vertebrate species will occur. A full discussion of feral cats and their associated removal program is presented in *Section 3.10: Invasive Wildlife Damage*.

3.7 Marine Flora and Fauna

3.7.1 Macroalgae

California kelp forest ecosystems are highly diverse and productive and are one of the most distinctive features of the California coastline. Kelp forests are important to the physical and biological mechanisms that sculpt the ecological processes of rocky nearshore ecosystems and their inhabitants. They extend from seafloor to surface and form a vertically structured habitat that is the fundamental element to many important ecosystems in southern California (Rodriguez *et al.* 2001). Southern California's benthic macrophytes are represented by over 700 varieties of seaweeds, corallines, brown algae, green algae, and seagrasses (Leet *et al.* 2001). Benthic macrophytes are intensely zone specific and individual species dominate a specific substrate at a specific depth profile.

Natural history studies have described numerous trophic and habitat associations among kelp forest and macroalgal community taxa and the dependence of these multiple trophic levels on the persistence of vegetated ecosystems. Most subtidal macroalgae need a firm anchor and suitable substrate for attachment and eventual growth to maturity. In southern California five kelp species represent the primary conduit of fixed carbon into the system (Graham 2004). Other subcanopy kelps are abundant at SNI forming a dense understory that provides food and protection for various fish and invertebrates. Below the subcanopy of kelps, or in other suitable areas, highly diverse groups of various nonkelp macroalgae species persist, including members of the brown, green, and red algae families (including coralline algae and crustose coralline algae). Temperature, light, sedimentation, substrate, relief, wave exposure, and biological factors (i.e. grazing, competition with other species) determine the distribution and abundance of macroalgae. The most persistent kelp beds occur on solid rock substrate with moderately low relief and moderate sand coverage; very low relief and abundant sand has less persistent kelp (Deysher *et al.* 2002).

Wharton and Mann (1981) argue that kelp stands provide shelter and structural complexity in reef environments, resulting in increased abundance and diversity of organisms such as fishes and larger crustaceans. A large number of studies confirm the relationship between the presence of kelp forests and increased abundance and diversity of temperate reef fishes (Bodkin 1988; DeMartini and Roberts 1990; Holbrook *et al.* 1990; Carr 1991; Anderson 1994). While fishes are typically considered to dominate the upper trophic levels of kelp forests, their dependence on the multitude of supporting tropic levels is imperative. Most communities and their component populations exist along environmental gradients. The vital role of giant kelp in the coastal environment is accompanied by its dependence on the waters in which it inhabits. Optimum growth conditions for kelp and other macroalgae rely on a consistent delivery of cool nutrient rich water supplied from localized or regional hydrodynamic mechanisms. The health and diversity of kelp forests and their associated macroalgae are dependent on the hydrodynamic processes of the SCB on the large scale; however, they, in turn, modify flow conditions in their interior and vicinity that affect a wide range of kelp forest residents on a smaller scale.

San Nicolas Island macroalgae are a complex assemblage of species typically associated with cold water ecosystems of the northern Channel Islands and central California. Macroalgae regularly observed along intertidal and subtidal rocky reefs of SNI are diverse and robust, supporting a wide array of invertebrate and fish. Productivity from kelp and associated macroalgae within nearshore waters surrounding SNI benefit multiple trophic levels and support various species of concern both directly and indirectly, including the black abalone, snowy plover, southern sea otter (*Enhydra lutris nereis)* and others.

Information from Merkel and Associates Inc. (2007a), associated with the Navy-sponsored biological surveys cited in *Section 3.7.2: Marine Invertebrates*, provides valuable species accounts and density data for macroalgae within intertidal and subtidal zones. Collected data followed similar methodologies and species categories utilized by various ongoing long term monitoring programs at CINP, SCI and Santa Catalina Island. The reported data provides important baseline data sets for subtidal and intertidal marine macroalgae and associated substrates. These surveys involved kelp forest assessments evaluating densities of key algal and invertebrates species at several permanent locations in order to characterize trends and species diversity.

Scientists from USGS–Biological Resources Division have surveyed six benthic study sites 33-39 feet (10-12 m deep) semiannually at SNI since 1980 (with few exceptions). At each site, five 20-m^2 permanent plots were established to enumerate macro-invertebrates and various kelps. The investigation examined the association between two species of sea urchins (*Strongelocentrotus* spp.) and giant kelp, and the their relationship to the southern oscillation (El Niño) as well as other ecological questions. These data provide the best long-term and comprehensive evaluation of subtidal macroalgae at SNI, but remain unpublished and unavailable.

3.7.2 Marine Invertebrates

Invertebrates inhabit nearly every conceivable niche within the marine environment and are typically divided by size (macro vs. micro), locomotion (motile vs. sessile), and habitat (benthic vs. pelagic). Benthic invertebrates inhabit the sea floor during most of their lives, but they may have pelagic gametes or larvae. Habitats are generally the primary classification tool used for partitioning marine invertebrates into functional groups for discussion. Substrate is typically divided into rock or unconsolidated (gravel, sand, or mud) sediments, hereafter referred to as soft sediment. Benthic species can be epifuanual (attached or motile that inhabit rock or sediment surfaces) or infaunal (those that live in rock or soft sediments) (Dailey *et al.* 1993). Information about marine invertebrate life histories, characteristics, and range are well documented for the intertidal and subtidal species compared to those of deeper areas (see Smith and Carlton 1975 and Morris *et al.* 1980).

Vertical zonation is obvious in the distribution of marine invertebrates, especially in the rocky intertidal where rocky surfaces span from the upper splash zone to the subtidal. Zonation is also evident to a lesser degree in sandy beaches and subtidal habitat where depth, circulation, and water movement dictate suitable habitat.

While very little information is available for the majority of SNI marine invertebrates that exist at greater than 98 feet (30 m) depth, a significant amount of scientific research has been published on intertidal and kelp forest ecology that applies to SNI. Published natural history studies have described clear functional ties to the presence of macroalgae (giant kelp, *M. pyrifera* in particular) for many marine invertebrates (Graham 2004). Sea urchins and gastropods (snails) are conspicuous grazers within kelp forests but rarely consume living algae and rely on drift algae as their primary food source. Abalone (*Haliotis* spp.) are common within the intertidal and subtidal waters of SNI represented by several species. The red abalone is the most numerically dominant of the species. The largest population of the federal endangered black abalone within the SCB is documented to inhabit SNI and has shown signs of recovery in recent years. The federally endangered white abalone was historically reported to occur within the subtidal waters of SNI, though limited documentation exists post 1980. Marine invertebrate predators include sea stars, crustaceans (crabs, lobster,

and shrimp), and several snails. Encrusting invertebrates make up the numerically dominant species within rocky reefs and include bryozoans, sponges, bivalves, tunicates, cup corals and various worms. The majority of the encrusted invertebrates filter food particles out of the overlying water column thus they are dependent on an ample supply of well circulated productive water common to SNI.

Few published marine biological surveys have been conducted at SNI. Caplan and Bootlootian (1967) conducted intertidal surveys at two locations, both located on the southern portion of the island between Dutch Harbor and Daytona Beach, and VanBlaricom (1993) studied the distribution of black abalone. VanBlaricom continues to be involved in an annual monitoring of black abalone at SNI in an effort to document population trends; however, data have not been published. In addition, the USGS has been monitoring giant kelp populations at SNI since 1980, but again, data are not available. In 2003, the Partnership for Interdisciplinary Studies of Coastal Oceans (PISCO) Coastal Biodiversity Surveys program[1] conducted intertidal surveys at two locations at SNI; one located on the northern portion of the island, and the other on the southern portion.

As part of the SNI ASBS exception process the SWRCB requested that the Navy conduct quantitative intertidal and subtidal biological surveys. A total of six sites were chosen for sampling around SNI representing four discharge sites and two reference sites (Merkel and Associates Inc. 2007a). At each sample station, marine biologists recorded the abundance and/or percent cover of organisms at each of three tidal elevations (+5, +3, and 0 feet [+1.5, +0.9, and 0 m] MLLW) using a 0.25-m^2 quadrat. For subtidal surveys, biologists using SCUBA determined the distribution and abundance of subtidal invertebrates and algae at the –40 feet (-12 m) MLLW isobath. Two metrics were derived from these surveys: number of taxa and abundance or percent cover (Merkel and Associates Inc. 2007a). Collected data followed similar methodologies and species categories utilized by various ongoing long-term monitoring programs at CINP. The reported data provide important baseline information for both subtidal and intertidal marine invertebrates and their representative habitats. All marine habitats surveyed at SNI had diverse, healthy communities. Variability amongst communities was attributed to normal variability and there was no indication of direct impacts associated with Navy activities.

Sandy beaches and subtidal soft bottoms support the majority of the species known to occur at SNI and are dominated by infaunal species. In shallow water, the epifaunal community is well developed and dominated by suspension feeders (Dailey *et al.* 1993). In water deeper than about 33 feet (10 m), the abundance of epifaunal animals declines markedly and most of those present are carnivores and scavengers (Morrin *et al.* 1988). Considering the greater stability of sediments with increasing depth, a shift from infaunal communities dominated by crustaceans to communities in which polychaetes are predominant has been observed (Oliver *et al.* 1980). Additionally, invertebrates that utilize tubes or burrows, mostly amphipod crustaceans, become increasing abundant at depth. Polychaetes (worms) typically dominate the infaunal assemblages in areas deeper than 66 feet (20 m) (VanBlaricom 1978). The Navy-conducted biological surveys cited in the previous paragraph provide valuable sandy beach and soft bottom species accounts and density data.

The interactions and trophic dependencies of SNI birds, fish, mammals and invertebrates to marine invertebrates are diverse and complex. Marine invertebrates contribute as primary and secondary food sources at many levels and are functionally important from the high intertidal to the deep subtidal. Their contributions and value to the ecology of many of the island's inhabitants and visitors should not be underestimated.

The diverse assemblage of marine invertebrates surrounding SNI supports birds, fish, marine mammals, and human commercial fishing on a fairly large scale. Marine invertebrates are the primary food source of many predatory invertebrates, shorebirds, demersal fishes, elasmobranches (sharks and rays), and marine mammals including the southern sea otter and harbor seal (*Phoca vitulina richardii*).

1. Website: http://cbsurveys.ucsc.edu.

3.7.3 Fishes

Of the 519 recognized California marine fish species, there are at least 481 species within the greater SCB, south of Point Conception (Horn 1980; Cross and Allen 1993; Horn *et al.* 2006). Geographical variation of both larval and adult fish distribution within the SCB is strongly related to depth preference, warm- or cold-water affinities of each particular fish species, and water mass influences associated with ocean circulation patterns. Fish can be categorized as pelagic (living in the water column), benthic (living on the ocean bottom), or demersal (associated with the ocean bottom, but are often found feeding in the water column). Considering the location of SNI and the predominant ocean circulation patterns fish assemblages more closely resemble the Northern Channel Islands and areas north of Point Conception than neighboring islands, Santa Barbara Island and SCI. The cold southerly flowing California current delivers fish larvae from central California while maintain relative cool water temperatures around SNI.

Previous studies of the biogeography of marine fishes and invertebrates throughout the southern California Channel Islands have noted three groups of related islands based on the current flow and resulting temperature regimes surrounding these islands (Seapy and Littler 1980; Engle 1994). In the first study, the islands of San Nicolas, San Miguel and Santa Rosa were found to form a cold-water grouping, Santa Cruz, Anacapa, and Santa Barbara formed an intermediate temperature grouping and the southern islands of San Clemente and Santa Catalina formed a warm-water assemblage. These patterns reflect, in part, the faunal transition between cold and warm that has been observed in the SCB, Pondella *et al.* (2005) and VRG (2009), in examining fish assemblages at SNI and other southern California and Baja Mexico Islands, reported that in general, the richness, diversity and composition of fish assemblages at the islands were found to reflect previously described biogeographical processes. The rocky reef fish assemblages of all islands in the survey were found to be significantly distinct from one another. Analyses based on the observable similarities and differences between organisms without regard to assumed genealogy revealed two clusters. San Clemente, Santa Catalina and North Coronado clustered as a warm-water assemblage in the middle of the San Diegan Province. The remaining islands Santa Cruz, San Nicolas, San Martin and San Benito grouped together as a cold-water assemblage, despite the geographically disjunct position of the islands within this cluster.

San Nicolas Island supports a variety of fish species including benthic and demersal groundfishes (e.g. flatfishes, skates/sharks/chimeras, rockfishes, etc.) and epipelagic fishes that are important recreational and commercial species. The epipelagic zone is defined as the portion of the water column between 328 feet (100 m) and the surface that is regularly illuminated and subject to fluctuations in temperature. It is inhabited by small schooling herbivores such as northern anchovy (*Engraulis mordax*), Pacific sardine (*Sardinops sagax caerulea*), and Pacific mackerel (*Scomber japonicus*); large, active, fast-growing, and long-lived schooling predators such as tunas; and large solitary predators such as sharks and swordfish. The small schooling bait fish fluctuate in abundance seasonally around SNI and take advantage of the elevated primary production associated with the dominant ocean circulation patterns. Pelagic fishes such as tuna, jacks, and other warm water species are less common and tend to migrate offshore to warmer waters.

The shelf and slope demersal rockfishes are the most specious genus of fishes off the western coast of North America. These fishes are typically the dominant species documented in many fish surveys, in terms of abundance and diversity, especially between the 66- to 656-foot (20- to 200-m) isobaths (Mearns *et al.* 1980). The rockfish complex of fishes is highly regulated on both a commercial and recreational basis. San Nicolas Island represents optimal habitat and is regularly targeted by both recreational and commercial fisheries. Fish species observed at SNI by Pondella *et al.* (2005) include eleven rockfish species (*Sebastes* spp.), greater than twice the number observed at any other surveyed island.

The Bight 2008 program collected observational fish data using SCUBA, in conjunction with macroalgae and invertebrate information, at five sites at SNI targeting four depths: 16-, 32-, 49-, and 82-foot (5-, 10-, 15-, and 25-m) contours along primarily rocky reef. A total of 20 species were recorded consisting of common kelp forest and a few rockfish species. The three most commonly observed species were the California

sheephead (*Semicossyphus pulcher*), blacksmith (*Chromis punctipinnis*), and señorita (*Oxyjulis californica*) (VRG 2009). California Department of Fish and Game commercial fisheries landing data reviewed for the years of 2004-2009 reported that invertebrates (lobster, market squid, and sea urchins) were the dominant fisheries both in terms of pounds landed and dollars generated. Commercial landings for fin fish for the SNI region during the same time period were an order of magnitude less in both categories and primarily represented by California sheephead, white seabass (*Atractoscion nobilis)*, rockfish, and sharks.

3.7.4 Marine Mammals

San Nicolas Island is important breeding, foraging and haulout habitat for several species of pinnipeds and the southern sea otter. The relative isolation of the island from the mainland coast, in conjunction with undisturbed sandy beaches and rocky headlands, provide ideal habitat for pinniped rockeries. Productive nearshore waters surrounding SNI support robust populations of the California sea lion (*Zalophus californianus*), northern elephant seal (*Mirounga angustirostris*), and harbor seals. San Nicolas Island is the most southerly distribution of the southern sea otter and supports a notable resident population. Transient observations of Guadalupe fur seals and an array of cetaceans are commonly recorded on a yearly basis. All marine mammals species that occur on or around SNI are protected under the Marine Mammal Protection Act (MMPA). This section describes the three primary pinniped populations document to breed or haul out at SNI and southern sea otters are covered later in this Section under *Section 3.8: Special Status Species* . The use of SNI coastal areas by transient and resident marine mammals during foraging, breeding, and haulout vary by habitat and time of year and have important implications to island use patterns and management strategies. Figure 3-5 represents the seasonal use patterns of the most common marine mammal species using SNI beaches and headlands.

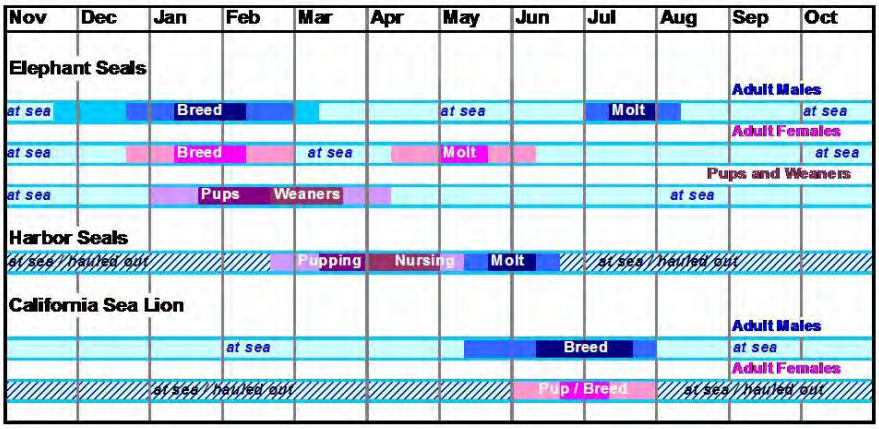
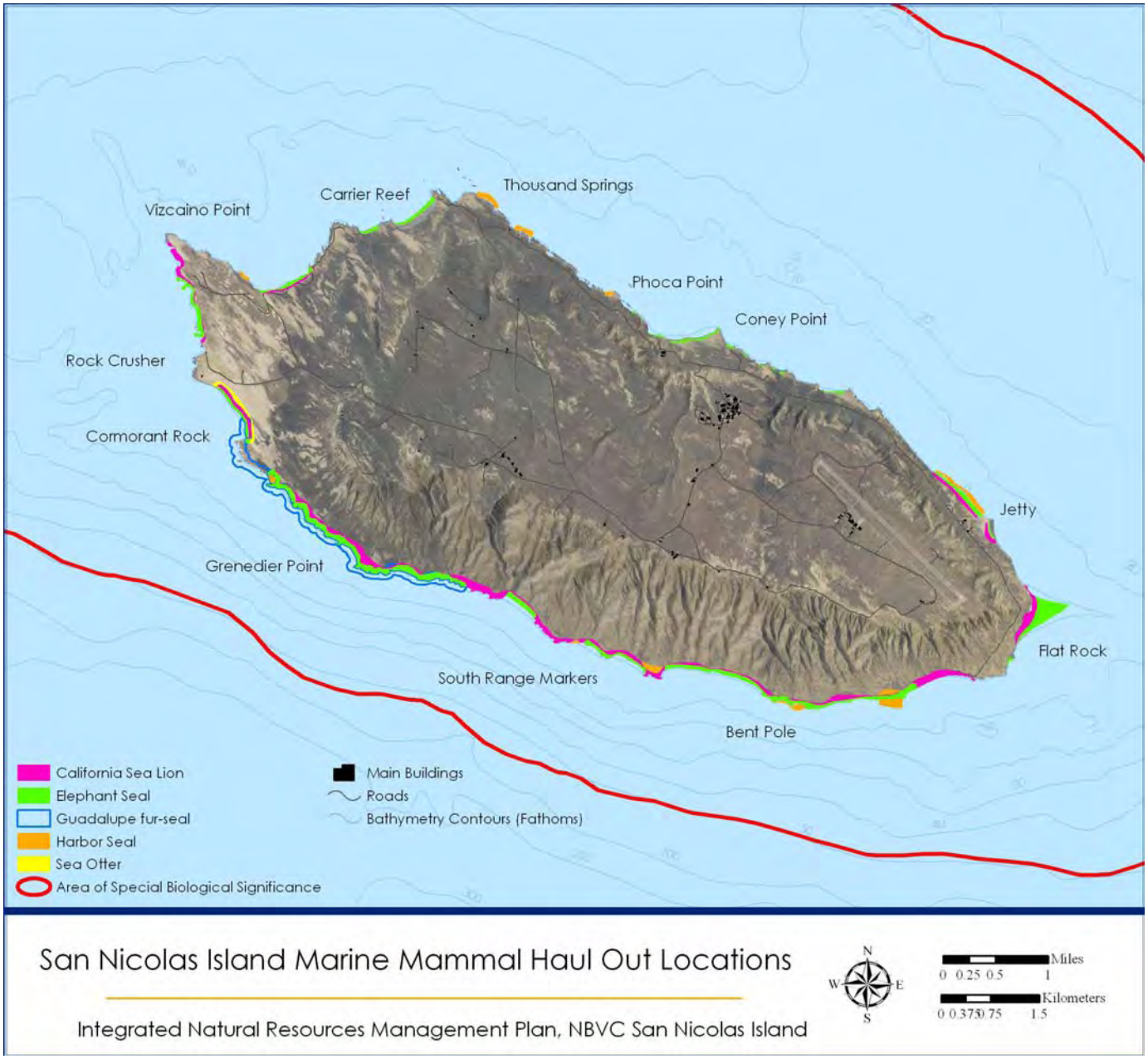


Figure 3-5. San Nicolas Island annual pinniped calender for the most common marine mammal species utilizing San Nicolas Island beaches and headlands.

3.7.4.1 California Sea Lion (*Zalophus californianus*)

The California sea lion is by far the most common pinniped on SNI (USDON 2005a). The U.S. stock is not considered a strategic stock under the MMPA. The California sea lion population estimate for the U.S. stock is 238,000 (Carretta *et al.* 2009). Nearly all of the U.S. stock (more than 95%) breeds and gives birth to pups on San Miguel Island, SNI, and Santa Barbara Island. Smaller numbers of pups are born on SCI, the Farallon Islands, and Año Nuevo Island (Lowry *et al.* 1992). Map 3-8 shows haul-out locations for sea lions on SNI.



Map 3-8. Marine mammal haul out locations on San Nicolas Island.

California sea lions utilize offshore waters for foraging to various degrees and tend to concentrate within geographical areas. If California sea lion distribution is determined primarily by prey abundance, these same areas might not be the center of sea lion distribution every year based on prey availability. During summer, the highest densities are found immediately west of San Miguel Island. During autumn, peak densities of sea lions are centered on Santa Cruz Island. During winter and spring, peak densities occur just north of SCI (Bonnell and Ford 1987). The seasonal changes in the center of distribution are attributed to changes in the distribution of the prey species (Lowry *et al.* 1991).

The distribution and habitat use of California sea lions also vary with the sex of the animals and their reproductive phase. Adult males haul out on land to defend territories and breed from mid-to-late May until late July. Individual males remain on territories for 27–45 days without going to sea to feed. During August and September, after the mating season, the adult males migrate northward to feeding areas as far away as Washington (Puget Sound) and British Columbia (Lowry *et al.* 1992). They remain there until spring (March–May), when they migrate back to the breeding colonies. Dis-

tribution of immature California sea lions is less well known, but some make northward migrations that are shorter in length than the migrations of adult males (Huber 1991). However, most immature seals are presumed to remain near the rookeries for most of the year (Lowry *et al.* 1992). Adult females remain near the rookeries throughout the year. Most births occur from mid-June to mid-July (peak in late June).

California sea lions haul out at many sites of SNI, primarily along the southern and western shores (Map 3-8). Pupping and mating season for sea lions begins in late May and continues through July (Heath 2002). Females nurse their pups for about eight days before beginning an alternating pattern of foraging at sea and attending/nursing pups on land; this pattern may last for eight months (with some pups nursing up to one year after birth). California sea lions haulout during the molting period in September, and smaller numbers of females and young animals haul out during most of the year.

Since 2001 the SNI California sea lion population has remained stable between 43,000 and 57,000 individuals, with the exception of the 2002 El Niño year (NOAA 2007a). San Nicolas Island pup production between 2003 and 2008 has consistently been reported between 25,000 and 29,000 individuals, which represents nearly 60 percent of the pups born into the population based on the carrying capacity developed by Carretta *et al.* (2009). Data collected at SNI over the past ten years suggests that the California sea lion population has leveled off indicating that the surrounding habitat may be approaching its carrying capacity. Based on the sea lions life history and dependence on available prey items to sustain pup production and subsequent population stability, regional oceanographic circulation appears to play a significant role in maintaining the current population at SNI.

3.7.4.2 Northern Elephant Seal (*Mirounga angustirostris*)

Northern elephant seals haul out at various sites around SNI (Map 3-8). Northern elephant seals molt, breed, and give birth primarily on offshore islands of Baja California and California. Rookeries are found as far north as the South Farallon Islands and Point Reyes (Barlow *et al.* 1993). The California population is demographically isolated from the Baja California population, and is considered a separate stock, although genetically the two populations are indistinguishable (Barlow *et al.* 1997). About two-thirds of the California population hauls out on San Miguel Island, approximately 30 percent on SNI, and the remaining seals (1%) use Santa Rosa, Santa Cruz, Anacapa, Santa Barbara, and San Clemente islands (Bonnell and Dailey 1993; USDON1998; Carretta *et al.* 2000). They are not listed as "endangered" or "threatened" under the ESA nor as "depleted" under the MMPA.

Northern elephant seals haul out on land to give birth and breed from December through March, and pups remain hauled out through April. After spending time at sea to feed (post-breeding migration), they generally return to the same areas to molt (Odell 1974; Stewart and Yochem 1984; Stewart and Delong 1989, 1995). However, they do not necessarily return to the same beach. Adult males tend to haul out to molt between June and August (peaking in July), whereas females and juveniles haul out to most between March and May (peaking in April). Different age classes of northern elephant seals are found in the SCB throughout the year (Carretta *et al.* 2000). For much of the year, northern elephant seals feed mostly in deep offshore waters, and their foraging range extends thousands of kilometers offshore from the breeding range into the eastern and central North Pacific (Stewart and DeLong 1995; Stewart 1997; Le Boeuf *et al.* 2000). Adult males and females segregate while foraging and migrating; females mostly range west to about 173°W, between the latitudes of 40°N and 45°N, whereas males range further north into the Gulf of Alaska and along the Aleutian Islands, to between 47°N and 58°N (Stewart and Huber 1993; Stewart and DeLong 1995; Le Boeuf *et al.* 2000).

Over the course of the year, about 23,000 elephant seals may use SNI, representing approximately 30 percent of the elephant seals hauling out along all California shorelines. The northern elephant seal population has been steadily increasing on SNI, and SNI is the second largest elephant seal rookery and hauling ground in southern California (USDON 2005a). The NMFS Southwest Fisheries Science Center (SWFSC) have performed censuses for northern elephant seals at SNI since 1988. Surveys are conducted during the peak of the breeding season (when numbers ashore will be greatest) in late January to early February, and late in the breeding season in mid-to-late Feb-

ruary. From 1988 to 1995 pup counts increased an average of 15.4 percent per year (USDON 2005a). Based on trends in pup counts, northern elephant seal colonies were continuing to grow in California through 2005 (Carretta *et al.* 2009). A generalized logistic growth model of pup counts indicate that the population reached its MNPL of 19,000 pups in 1992, but has not reached carrying capacity at 38,200 pups per year (Carretta *et al.* 2009). Northern elephant seal pup census performed in 2005 recorded the greatest number of pups produced in a single year since surveys began in 1958.

A complete population count of elephant seals is not possible because all age classes are not ashore at the same time. Elephant seal population size is typically estimated by counting the number of pups produced and multiplying by the inverse of the expected ratio of pups to total animals (McCann 1985). Based on the estimated 35,549 pups born in California in 2005 and a 3.5 multiplier, the California stock was approximately 124,000 in 2005 (Carretta *et al.* 2009). During the 2005 NOAA census a total of 9,591 pups were reported for SNI, representing approximately 27 percent of the California pup production for that year (NOAA 2007b).

The California breeding population is now demographically isolated from the Baja California population. The current northern elephant seal population is expanding rapidly based on interpretation of the pup production curve reported in the 2007 USFWS stock assessment. The expansion of the population over the last decade has manifested the use of new beaches as haulout areas throughout the Channel Islands and Central California creating new management considerations and resource allocation.

3.7.4.3 Harbor Seal (*Phoca vitulina richardii*)

Harbor seals are considered abundant throughout most of their range from Baja California to the eastern Aleutian Islands. The SCB is near the southern limit of the harbor seal's range (Bonnell and Dailey 1993). These seals do not make extensive pelagic migrations, but do travel 162-270 nm (300-500 km) on occasion to find food or suitable breeding areas (Herder 1986). In California, approximately 400-600 harbor seal haulout sites are widely distributed along the mainland and on offshore islands, including intertidal sandbars, rocky shores and beaches (Hanan 1996; Lowry *et al.* 2005). San Nicolas Island harbor seals haulout at several specific, traditionally used sandy, cobble, and gravel beaches (Map 3-8). A few seals haul out at onshore and offshore ledges and reefs, mostly during the pupping and molting seasons (Stewart and Yochem 1994).

Peak numbers of harbor seals haul out on land during late May to early June, which coincides with the peak of their molt. Pupping occurs on beaches from late February to early April, with the nursing of pups extending into May. When at sea during May and June (and March to May for breeding females), they generally remain in the vicinity of haul out sites and forage close to shore in relatively shallow waters. Breeding occurs between late March and early May. Harbor seals are found in the SCB throughout the year (Carretta *et al.* 2000).

The population of harbor seals in California during 2004 was estimated to be 43,449 individuals using a factor of 1.65 to correct for the fraction of seals not hauled out during overflights. In 2004, there were 4,344 harbor seals counted onshore at the Channel Islands, 21,989 along the mainland coast and San Francisco Bay estuary, and 26,333 statewide. In southern California, approximately 70 percent of seals were found at Santa Cruz, Santa Rosa, and San Miguel islands (Lowry *et al.* 2008).

The population of harbor seals in California is increasing (contrary to indications from the 2002 survey [see NOAA 2003]), but the rate of increase is lower than it was during the 1980s and 1990s (Lowry *et al.* 2008). However, since the 1990s, the 2002 and 2004 harbor seal counts in southern California, as well as at the Channel Islands, show no noticeable increase (Lowry *et al.* 2008). The most recent published aerial count at SNI reported 754 harbor seals during May 2009 (Carretta *et al.* 2009). The actual number of harbor seals using SNI is probably higher than annual counts because not all seals are detected on shore during any one aerial survey. There is no recent published information on the number of harbor seals at specific haulout sites on SNI, but total numbers of seals using the island have remained relatively stable between 2002 and 2009. Counts performed over by NOAA over the last decade have ranged from 584 in 2002 (El Niño year) and 858 individuals in 2007 (Carretta *et al.* 2009).

3.8 Special Status Species

3.8.1 Federally Listed Species and Critical Habitat

Animals found on SNI which are listed under the federal ESA as threatened or endangered are described here (Table 3-3). Both terrestrial and marine species are encompassed within this group and include the federally threatened Island night lizard, western snowy plover and Guadalupe fur seal as well as the federally endangered black abalone and white abalone.

Table 3-3. Federally threatened and endangered species of San Nicolas Island (CNDDB 2009).

Species Name	Status	Status on San Nicolas Island
island night lizard (*Xantusia riversiana*)	FT;	Common (~15,000 individuals) but patchily distributed resident, primarily over the eastern half of island where there is sufficient natural habitat.
western snowy plover (*Charadrius alexandrinus nivosus*)	FT	Common (~75-100 individuals) year-round breeding resident on sandy beaches; highest concentration on NW edge of Red Eye Beach, W of Dutch Harbor to Daytona Beach and Sand Spit.
black abalone (*Haliotis cracherodii*)	FE	Fairly common year-round, breeding, within crevice habitat of intertidal rocky reefs.
white abalone (*Haliotis sorensoni*)	FE	Rare (unknown number of individuals) year-round resident in nearshore marine environment.
Guadalupe fur seal (*Arctocephalus townsendi*)	FT;	Several records along the southwest shore.

(FE = Federally Endangered, FT = Federally Threatened).

3.8.1.1 Black Abalone (*Haliotis cracherodii*)

The black abalone was added to NMFS's Candidate Species list on 23 June 1999 (64 FR 33466), transferred to NMFS's Species of Concern list on 15 April 2004 (69 FR 19975), and was listed as federally endangered on 14 January 2009 (74 FR 1937), under the ESA.

Black abalone ranged historically from Crescent City (Del Norte County, California) to Cabo San Lucas (southern Baja California), but their current range is thought to extend from Point Arena (Mendocino County, California) to northern Baja California and rarely occurs north of San Francisco (Morris *et al.* 1980). This species occurs higher in the intertidal zone than any other California abalone from the high intertidal zone to six m depth, rendering it more vulnerable to terrestrial predators but safer from marine hunters (Morris *et al.* 1980). Small animals dwell in crevices and may move about in search of food; animals over 3.5 inches (90 millimeters [mm]) long occupy more exposed rocks, at least where sea otters are absent, and are quite sedentary. Average black abalone shell length is approximately 4.5 inches (115 mm); however, maximum shell length may exceed 7.9 inches (200 mm) (Morris *et al.* 1980). Larval black abalone tend to settle into areas characterized by bare rock and coralline red algae (Douros 1985; Miner *et al.* 2006). Once settled onto rocky substrata, black abalone juveniles consume rock encrusting coralline algae and diatom and bacterial films (Haaker *et al.* 1986). Adult black abalone feed primarily on pieces of algae drifting with the surge or current, such as giant kelp, bull kelp, and feather boa kelp (Haaker *et al.* 1986). Growth rates can vary depending on food availability, water temperature, and other environmental factors (CDFG 2005). Abalone are long-lived (30+ years) and it takes approximately 20 years for black abalone to reach their maximum length (Blecha *et al.* 1992). Black abalone are preyed upon by a wide variety of marine predators including seastars, fishes, octopus, the southern sea otter, and striped shore crab (*Pachygrapsus crassipes*).

Historically, sea otter predation and hunting by Native Americans were two primary sources of mortality for large black abalone. Chinese immigrants began harvesting abalone from dense intertidal beds in central and southern California and Baja California in the mid-1800s, and annual harvest reached a peak of 2,000 tons (1,814 metric tons [MT], or 4,000,000 pounds) in 1879 (Howorth 1978; Rogers-Bennett *et al.* 2002). Commercial harvest was banned in the early 1900s, during which time black abalone popu-

lations expanded slightly. However, in 1968 commercial harvest of black abalone resumed. The commercial harvest was greatest around the islands off southern California, particularly San Miguel Island, SCI, and SNI (CDFG, unpublished data). By the mid-1980s overharvesting, as evidenced by declining trends in fishery-dependent data and eventual closure of the commercial fishery reduced southern California coastal populations of black abalone considerably. In the mid- and late-1980s, black abalone on the Channel Islands suffered massive local die-offs (generally >90% losses) from a disease known as Withering Syndrome (Haaker *et al.* 1992; Richards and Davis 1993; Lafferty and Kuris 1993). The cause of Withering Syndrome was confirmed and has been attributed to a Rickettsiales-like pathogen (Friedman *et al.* 2000). The principal cause of black abalone population decline in southern and central California has been attributed to over-harvesting (Karpov *et al.* 2000) and/or the onset of Withering Syndrome in southern California in the 1980s (Lafferty and Kuris 1993) and that disease's northward progression. Black abalone populations have declined by over 99 percent in southern California (except for SNI and San Miguel Island).

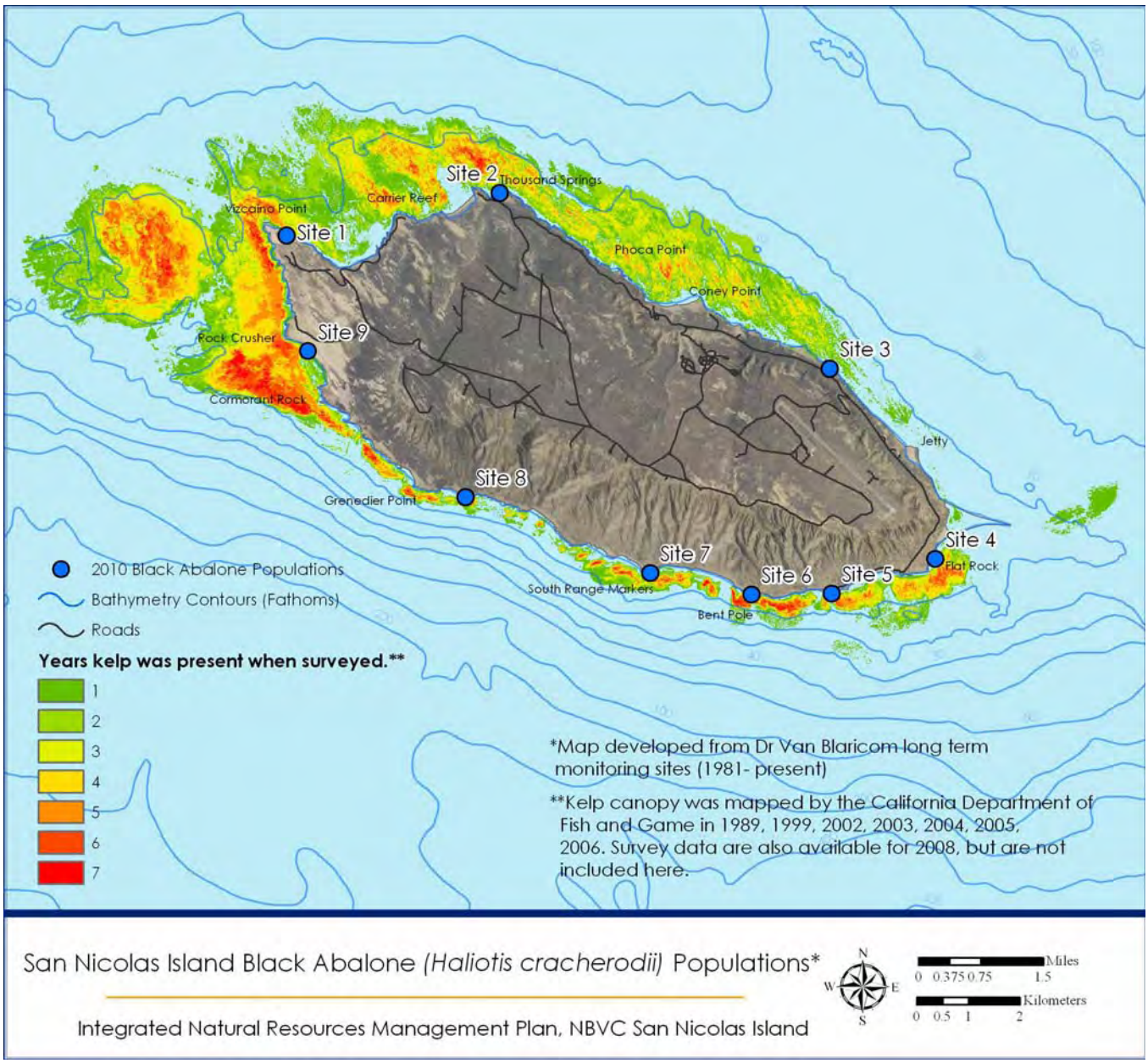
The SNI black abalone population has sustained significant declines since the 1980's, though to a lesser degree than other geographical locations. The current status of SNI black abalone was reported recently from a long-term population monitoring program, with surveys at SNI sites from January through November 2008 (VanBlaricom 1993; VanBlaricom unpublished data). The 2008 data closely matches those collected from 2001 through 2007. However, a slight upward trend is now apparent on an island-wide scale, resulting from patterns in study sites on the south shore of SNI. Refer to Map 3-9 for a map of SNI's black abalone populations that is based on data obtained from a long-term monitoring program.

3.8.1.2 White Abalone (*Haliotis sorenseni*)

The white abalone is a federally listed endangered marine invertebrate and historically found from Punta Abreojos, Baja California, Mexico, to Point Conception, California. It is a prosobranch gastropod mollusk that occurs on hard substrate, reportedly in water depths of 65 to 196 feet (20 to 60 m) (NMFS 2008). It prefers a specific type of habitat, consisting of open, low-relief rock or boulders surrounded by sand. Sand may be important in forming channels for the movement and concentration of their primary food, algal drift. They also appear to be restricted to depths where algae will still grow, a function of light and substrate availability (Hobday and Tegner 2000). White abalone are relatively sedentary and do not form large aggregations. They have separate sexes (i.e. males and females) and reproduce by broadcast spawning, reaching sexual maturity at age four to six years at a size of three to five inches (9 to 13 cm). Newly settled individuals feed on benthic diatoms, bacterial films, and single-celled algae found on coralline algal substrates. As they grow larger, white abalone feed on drift and attached algae, including deeper water brown taxa *Laminaria farlowii* and *Agarum fimbriatum.* Adult white abalone can reach a shell length of up to approximately nine inches (21 cm).

The white abalone was commercially harvested throughout its range until the mid-1970s, when stocks declined precipitously. It was federally listed as an endangered species on 29 May 2001 (NOAA 2001).

While historical accounts describe the occurrence of white abalone throughout much of the SCB, only a few individuals were officially documented at SNI during a CDFG survey in 1974 (CDFG 1974). The majority of the existing white abalone population within the SCB has been documented within the southern Channel Islands and offshore banks. San Nicolas Island likely represents the northwesterly extent of suitable habitat, but intensive investigations have yet to be performed. Surveys conducted by the CDFG (Haaker *et al.* 2001) at five California islands and three offshore banks resulted in counting a total of 157 white abalone within 141 acres (0.5 ha) of habitat. The mean density calculated from these data was 6.7 white abalone per acre (range 0 to 24.2 per acre) with densities at Tanner and Cortes Banks being the highest.



Map 3-9. San Nicolas Island Black Abalone Populations.

In October 1999, surveys were conducted in potential white abalone habitat areas around SCI. A total of 24 white abalone were found, ranging from one to six individuals per site, at 10 of the 26 sites surveyed. Abalone were found in 98 to 197 feet (30 to 60 m) of water, with most in approximately 157 feet (48 m). White abalone surveys at Tanner and Cortes banks in 1999 (Lafferty *et al.* 2004) found the mean depth for this species to be 154 feet (47 m) at Tanner Bank and 157 feet (48 m) at Cortes Bank.

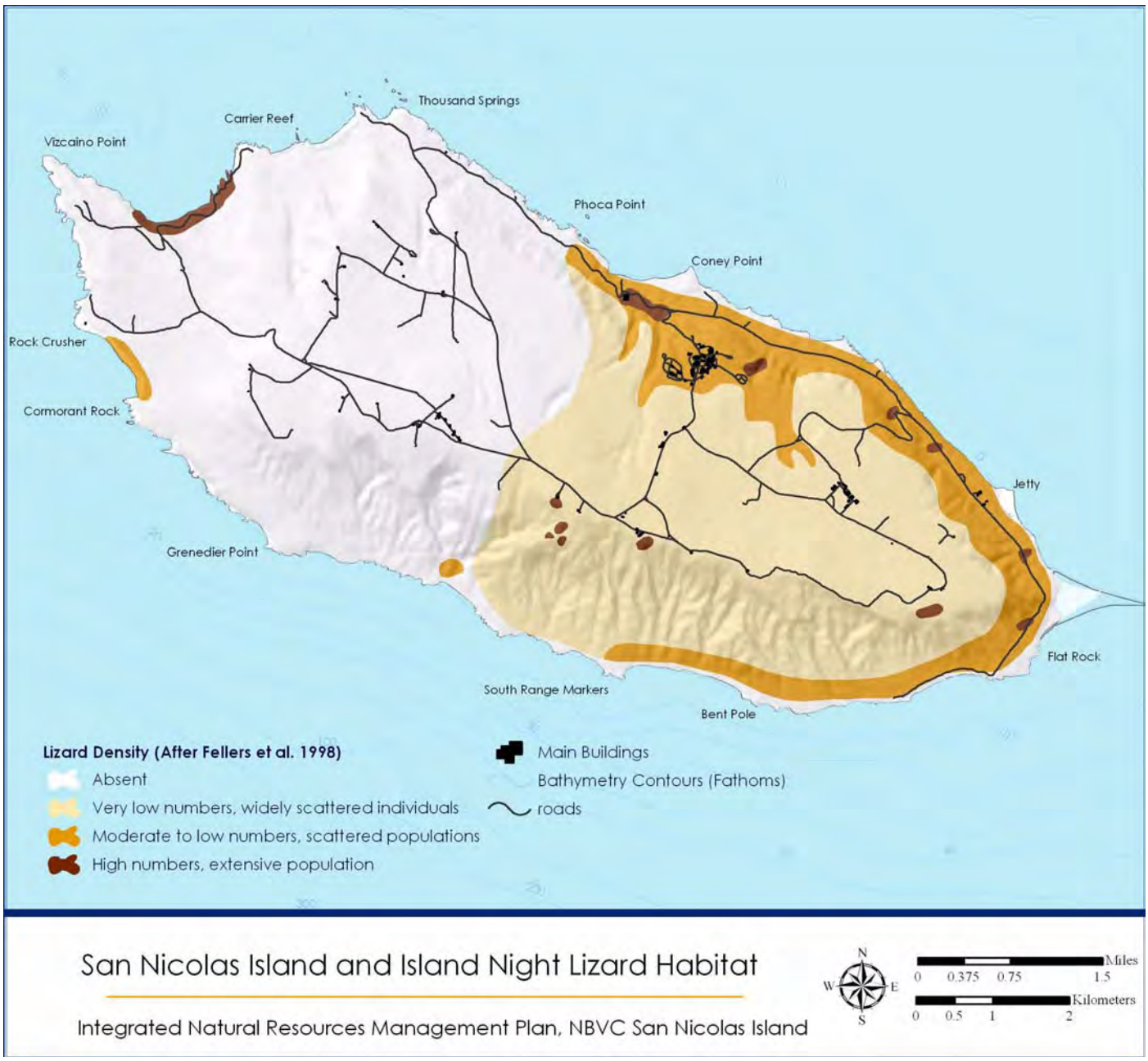
More recent (2002-2004) habitat mapping and surveys for white abalone at SCI and Tanner and Cortes Banks resulted in a much greater estimate of suitable habitat and population sizes (Butler *et al.* 2006). In August of 2004, the U.S. Navy participated with NMFS SWFSC and California State University Monterey in identifying and surveying potential white abalone habitat off the west shore of SCI from Castle Rock south to China Point. The surveys were conducted over a 10-day period and consisted of multibeam and sidescan sonar mapping to identify potential substrate and habitat from the seaward edge of the kelp beds at 82 feet (25 m) out to approximately 248 feet (75 m) along the western side of SCI. Extensive remotely operated vehicle surveys

were conducted where suitable habitat was identified. These survey results were analyzed along with previous surveys of SCI and Tanner and Cortes Banks (Butler *et al.* 2006). In all surveys, white abalone were found almost exclusively at depths of 100 to 200 feet (30 to 60 m). Abalone were found on substrate consisting of rocky reef or sand/rock interface; white abalone were not found in areas of only sandy bottom (Butler *et al.* 2006). The resulting estimate of suitable habitat is 2,220 acres (889 ha) on SCI, partially based on the increased percentage of rocky substrate in the continental shelf when compared with previous habitat evaluations (Butler *et al.* 2006). The SCI population is estimated as 1,938+/-1,598 individuals (Butler *et al.* 2006).

Considering the historical abalone landings and requirements for suitable habitat and growth, white abalone populations at SNI are likely rare. No focused white abalone surveys have been performed around SNI due to the probability of finding them, difficult logistics, and consequential cost.

3.8.1.3 Island Night Lizard (*Xantusia riversiana*)

The island night lizard is medium-sized, cryptically patterned lizard endemic to the Channel Islands, where it occurs on SNI, Santa Barbara Island, and SCI. The island night lizard is the most morphologically distinct of the endemic vertebrates on the Channel Islands, indicating a long period of isolation from the mainland (Bezy *et al.* 1980). Island night lizards are sedentary and have small home ranges, averaging about 183 ft^2 (56 m^2). This species is active primarily from March to September with timing of activities largely dependent on mild to warm temperatures (USDON 2005a). The island night lizard is omnivorous, eating insects, plants, and small mammals. The lizards breed in April, and young are born in September (Goldberg and Bezy 1974). Lizard numbers vary greatly depending on available habitat and are typically associated with defined areas (Map 3-10). Grasslands that cover much of the eastern mesa support few or no lizards, while the mixed shrub communities support moderate numbers of island night lizards. The highest island night lizard densities are associated with cacti and boxthorn (*Opuntia* and *Lycium* spp.) (Smith 1993; Fellers *et al.* 1998). Fellers *et al.* (1998) estimated the island night lizard population on SNI to be about 15,300 lizards. On the eastern part of the island they occur from the low beach terraces on the north and south sides to the highest elevations at the top of the mesa overlooking the southern escarpment. In contrast, island night lizards on the west side of the island are essentially restricted to cobble-driftwood near Red Eye Beach. The broad grasslands that cover much of the eastern mesa support few or no lizards. Mixed shrub communities, whether on the low marine terrace on the north and south sides of the island, in some canyons, or on top of the mesa, support moderate numbers of island night lizards. Predators of the island night lizard include the San Nicolas Island fox and feral cats. Introduced southern alligator lizards may compete for burrows and food as well as possible depredation on young island night lizards. Critical Habitat for the island night lizard has not been designated. The USFWS listed the island night lizard as a threatened species on 11 August 1977 due to its restricted range and apparently low population levels on two of the three islands in which it inhabits (42 FR 40682). Currently the Carlsbad office of the USFWS is conducting a review of the species' conservation status to determine if the Navy's proposed delisting is warranted (USFWS 2006). The U.S. Navy petitioned the USFWS to delist the island night lizard in 2004, and in 2006 the USFWS announced a review of the species' conservation status to determine if proposed delisting is warranted (USFWS 2006). As of writing, this process is ongoing.



Map 3-10. Distribution of the island night lizard (Xantusia riversiana) on San Nicolas Island.

3.8.1.4 Western Snowy Plover (*Charadrius alexandrinus nivosus*)

The western snowy plover is listed by the USFWS as threatened and by the CDFG as a species of special concern (USFWS 2006, 2007). The western snowy plover is a subspecies of snowy plover that breeds and winters on coastal beaches along the Pacific coastline from southern Washington State south to Magdalena Bay, Baja Sur, Mexico. Populations consist of both migrants and year-round residents depending on locality. Snowy plovers breeding in Oregon have been observed wintering in California as far south as Monterey, while snowy plovers breeding in central California have been observed south as far as Guerro Negro, Baja Mexico (Warriner *et al.* 1986).

The average life span of western snowy plovers is estimated at 2.7 years, although a bird of 15 years was observed by Warriner *et al.* (1986). Minimum survival rates of adults have been inferred by individual plover resightings by several projects (Warriner *et al.* 1986; Page *et al.* 1983; Paton 1994).

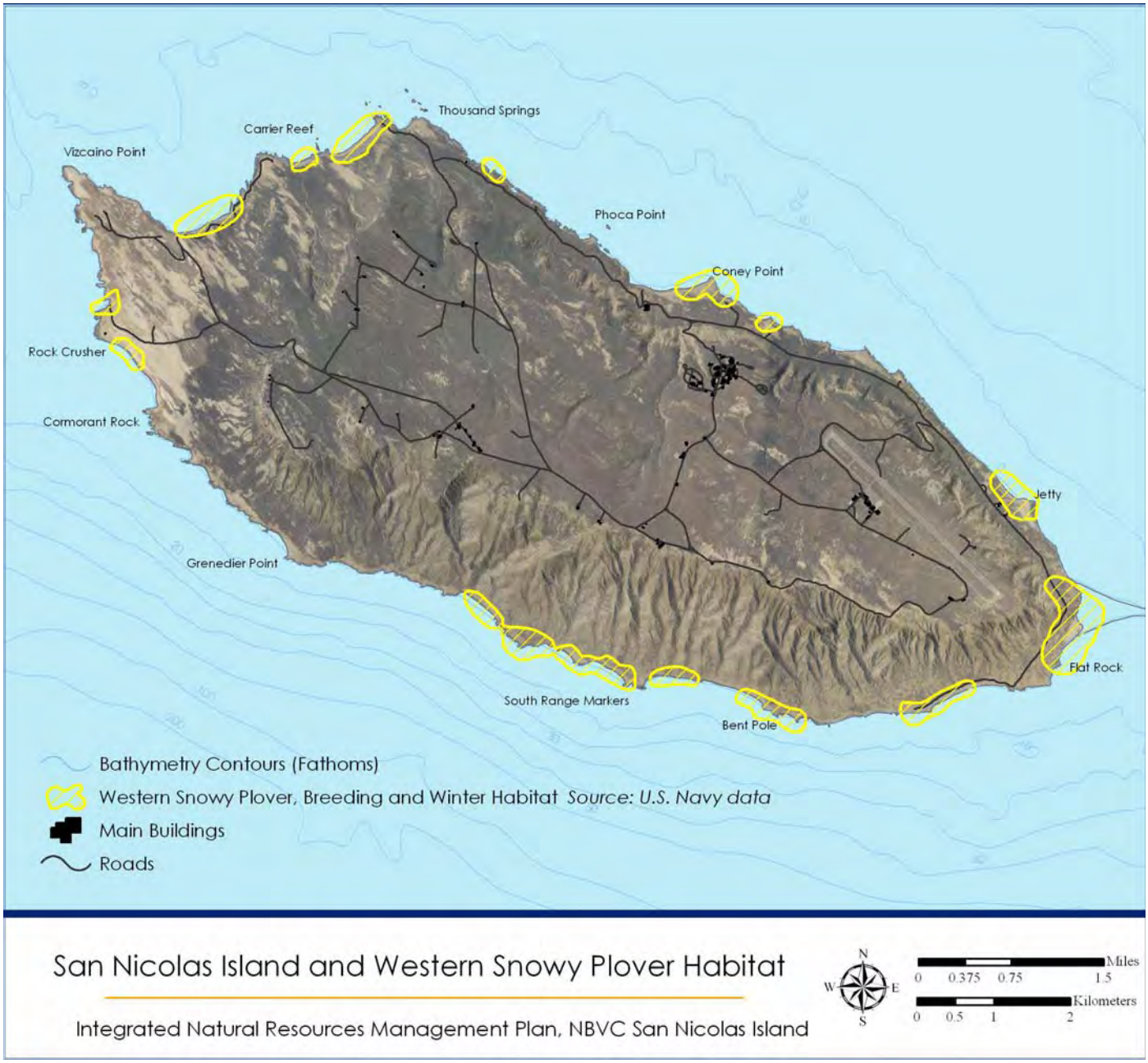
The western snowy plover nests on undisturbed, flat areas with loose substrate, such as sandy beaches and dried mudflats along the California coast. Sand spits, dune backed beaches, sparsely to unvegetated beach strands, open areas around estuaries, and beaches at river mouths are the preferred coastal nesting areas of the snowy plover (Page and Stenzel 1981; Powell *et al.* 1997; Wilson 1980). Nesting generally occurs between March 1 and September 15 of each year, though egg laying in southern California has been documented as early as mid-February, and continues through late July. Two to six eggs, usually three, are laid in a shallow depression scraped into the sand, or other saline substrates. Incubation does not begin until the full clutch is laid and continues for 24 to 33 days with an average of 27 days before eggs are hatched (Warriner *et al.* 1986). The incubation is performed mostly by the male, although both sexes incubate the eggs, with multiple clutches per season possible (Ehrlich *et al.* 1988). The scrape usually has small pieces of shell, vegetation or driftwood associated with it. Young fledge and are independent within 29 to 47 days (Ehrlich *et al.* 1988).

Snowy plovers breed in loose colonies with the number of adults at coastal breeding areas ranging from 2 to over 300 (Page and Stenzel 1981). Nesting density is apparently dependent on predatory pressure. Page and others (1995) documented nesting density to be one nest per 15 acres (6 ha) at Mono Lake where predatory pressure is high, while 20 nests per 15 acres (6 ha) were recorded at Monterey Bay where predatory pressure is low. Nest success ranges from 0 to 80 percent for coastal snowy plovers (Widrig 1980; Wilson 1980; Saul 1982; Wilson-Jacobs and Dorsey 1985; Warriner *et al.* 1986). Instances of low nest success have been attributed to predation, human disturbance, and inclement weather conditions. Although the majority of snowy plovers are site faithful, returning to the same breeding location in subsequent breeding seasons, some dispersal occurs (Stenzel *et al.* 1994; Warriner *et al.* 1986).

Chicks are precocial and broods rarely remain within the nesting territory after hatching (Warriner *et al.* 1986). Birds are able to fly within approximately 31 days of hatching. Snowy plovers will re-nest after loss of a clutch or brood (Wilson 1980, Warriner *et al.* 1986). Double brooding and polygamy have been observed in snowy plovers along coastal California (Warriner *et at.* 1986). Snowy plover females may abandon chicks as young as six days old to find another mate leaving the male as the only adult to care for the brood (Warriner *et al.* 1986). Re-nesting may occur in the same scrape, in close proximity to the initial nest, or in a new location distant from the first attempt (Powell and Collier 1994; Powell *et al.* 1997; Warriner *et al.* 1986). Females may re-nest 2 to 14 days after nest failure (Warriner *et al.* 1986). Males attend their young for 29 to 47 days (Warriner *et al.* 1986).

Snowy plovers forage primarily on the wet sand at the beach-surf interface, where they feed on small crustaceans, marine worms, insects, and amphipods. Both snowy plover adults and young forage on these invertebrates along intertidal areas, beaches in wet sand and surf cast kelp, in foredune areas of dry sand above the high tide, on salt pans, and along the edges of salt marshes and salt ponds.

San Nicolas Island's population size is closely related to the movements of migrating individuals and success of the breeding population. Numbers are lowest at the beginning of the breeding season and increase in fall as wintering birds arrive. Areas of highest concentration are Tender Beach, Coast Guard Beach, west of Dutch Harbor to Daytona Beach, and Sand Spit. Breeding season surveys of adults documented 96 in 2006, 68 in 2007, 46 in 2008, and 50 in 2010 (G. Smith, *pers. comm.*, 2010). Winter season surveys of adults documented 182 in 2007, 138 in 2008, and 86 in 2009 (G. Smith, *pers. comm.*, 2010). During the 2009 Summer Window Survey conducted along the Pacific Coast, 69 adult snowy plovers were recorded on SNI (G. Smith, *pers. comm.*, 2010). This total comprised approximately 35 percent of snowy plovers observed in Ventura County during the 2009 Summer Window Survey (USFWS 2009). See Map 3-11 for breeding and wintering habitat on SNI.



Map 3-11. Western snowy plover breeding and wintering habitat on San Nicolas Island.

3.8.1.5 Guadalupe Fur Seal (*Arctocephalus townsendi*)

Prior to commercial sealing during the 19th century, the Guadalupe fur seal (*Arctocephalus townsendi*) ranged from Monterey Bay, California, to the Revillagigedo Islands, Mexico (NMFS 2006). The only breeding colony of Guadalupe fur seals is at Isla Guadalupe, Mexico. Between 1969 and 1989, 48 sightings of Guadalupe fur seals were made on the southern Channel Islands, including one territorial male that was seen from 1981 to 1990 and a second bull who established a territory from 1989 to 1991 (Reeves *et al.* 1992). Guadalupe fur seals pup and breed mainly at Isla Guadalupe, Mexico. In 1997, a second rookery was discovered at Isla Benito del Este, Baja California, and a pup was born at San Miguel Island, California (Melin and DeLong 1999). Researchers know little about the whereabouts of Guadalupe fur seals during the non-breeding season from September through May, but they are presumably solitary when at sea. Females give birth from early June through July, with a peak in late June. They mate

about a week after giving birth, and then begin a series of foraging trips lasting two to six days. They come ashore for four to six days between foraging trips to nurse their pups. Lactating females may travel a thousand miles or more from the breeding colony to forage. All breeding and pupping occurs from approximately June through late July on Isla Guadalupe and Isla Benito del Este in Baja Mexico (Gallo-Reynoso 1994). There is little information on feeding habitats of the Guadalupe fur seal, but it is likely that they feed on deep-water cephalopods and small schooling fish, similar to their relative the northern fur seal (Seagars 1984). They appear to feed mainly at night, at depths of about 65 feet (20 m), with dives lasting approximately 2.5 minutes (Reeves *et al.* 2002).

The population of Guadalupe fur seals has increased significantly since the turn of the century. Commercial sealing during the 19th century reduced the once-abundant Guadalupe fur seal to near extinction in 1894. After that, it was thought to be extinct, until a lone male was found on SNI in the 1950s. An expedition from Scripps Institution of Oceanography discovered a small breeding colony on Guadalupe Island in 1954. The Guadalupe fur seal population increased at an average annual rate of 13.7 percent from 1954 to 1993 (Gallo-Reynoso 1994; Carretta *et al.* 2007), and it may be expanding its range (Gallo-Reynoso 1994). The most recent population estimate of Guadalupe fur seals was 7,408 (Carretta *et al.* 2007).

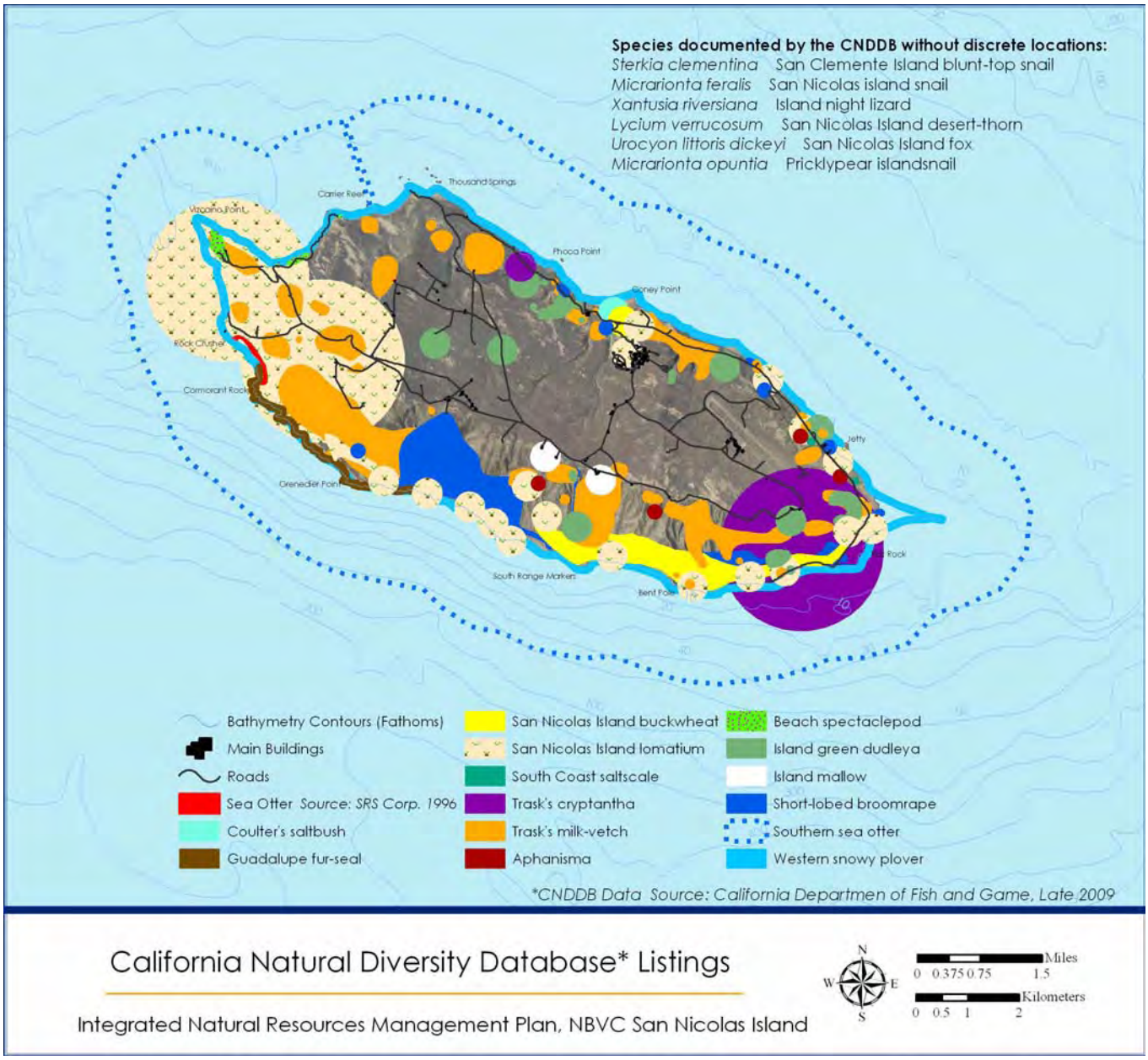
Guadalupe fur seals have been intermittently observed on SNI since the mid 1980s and most recently in 2007 (G. Smith, *pers. comm.*, 2010.). At SNI, male Guadalupe fur seals have occasionally established territories among breeding California sea lions. Recent sightings of Guadalupe fur seals at SNI have been recorded by various natural resource personnel over the last three years (G. Smith, *pers. comm.*, 2010) and are depicted in Map 3-8 based on CNDDB records (CNDDB 2009).

Guadalupe fur seals are listed as threatened under the ESA, and as depleted and a strategic stock under the MMPA. The state of California lists the Guadalupe fur seal as a fully protected mammal in the Fish and Game Code of California (Chapter 8, Section 4700 d), and it is also listed as a threatened species in the Fish and Game Commission California Code of Regulations (Title 14, Section 670.5, b, 6, H). The Guadalupe fur seal is also protected under Convention on International Trade in Endangered Species (CITES) and fully protected under Mexican law. Guadalupe Island was declared a pinniped sanctuary by the Mexican government in 1975. Critical habitat has not been designated for this species in the U.S.

3.8.2 Other Special Status Species

Special status species of SNI include native and endemic flora and fauna that have been identified by the State of California as endangered or threatened or recognized by conservation organizations as species of concern. The distribution of special status terrestrial plants, terrestrial invertebrates, terrestrial reptile (e.g. island night lizard), and a terrestrial mammal (e.g. San Nicolas Island fox) are identified in Map 3-12. The data used to develop Map 3-12 was obtained from the CNDDB. The data contained in that database does not identify discrete locations for populations of species, but rather identifies broad areas where these species may occur. Specifically, the species identified in Map 3-12 do not have an island wide distribution other than the San Nicolas Island fox (G. Smith, *pers. comm.*, 2010).

More information concerning special status terrestrial plants, terrestrial invertebrates, and terrestrial mammals can be found in subsequent discussion in this section. Refer to the previous section concerning federally threatened and endangered species for more information on the island night lizard.



Map 3-12. California Natural Diversity Data Base records for sensitive species including the southern sea otter habitat at San Nicolas Island.

3.8.2.1 Special-Status Plants

Special-status plants on SNI include one state endangered, one state threatened, one state rare, and five considered rare, threatened, or endangered by CNPS (Table 3-3). Table 3-4 lists twenty eight native plant species that occur on SNI and are species of concern within some portion of their California range. The table provides information regarding the plants current status with regards to the State of California, CNPS, Global Ranking, occurrence on the channel islands, and representative vegetation community. While some of the plant species listed in Table 3-4 are common or abundant on SNI they remain a species of concern in other portions of California.

Table 3-4. Special-status plant species on San Nicolas Island.

Species Name	State Listing	CNPS Status	Global/ State Rank	Channel Island Endemics, and Islands Occupied	Vegetation Community	Status on SNI	Expected Known Threats on SNI
sticky sand-verbena *(Abronia maritima)*	-	4.2	G4?/S3?		Coastal dunes	Common, sandy flats, stabilized and unstabilized dunes	Invasive plants on dunes.
San Diego needlegrass *(Achnatherum diegoensis)*	-	4.2	G3/S3.2		Chaparral Coastal scrub	Abundant, canyon walls and sandy slopes	Invasive plant encroachment and activities with a direct or indirect impacts canyon walls.
aphanisma *(Aphanisma blitoides)*	-	1B.2	G2/S1.1		Coastal bluff scrub Coastal dunes Coastal scrub/sandy	Rare, dry slopes, cactus patches	Disturbance in Opuntia sp. patches. Invasive non-native plants
south coast saltscale *(Atriplex pacifica)*	-	1B.2	G3G4/S2.2		Coastal bluff scrub Coastal dunes Coastal scrub Playas	Rare, sandy flats, eroded slopes	Disturbance and erosion. Invasive non-native plants
island sagebrush *(Artemisia nesiotica)*	-	4.3	G3/S3.3	Santa Barbara Island, San Clemente Island, San Nicolas Island	Coastal scrub (rocky) Valley and foothill grassland	Occasional, gullies, swales, canyon slopes, and flats	Erosion. Invasive non-native plants
Trask's milkvetch *(Astragalus traskiae)*	CR	1B.2	G2/S2.2	Santa Barbara Island and San Nicolas Island Endemic	Coastal bluff scrub Coastal dunes Coastal scrub	Abundant, sandy slopes, stabilized dunes, coastal bluffs, eroded caliche slopes, sandy canyon bottoms, and flats	Invasive non-native plants
island morning-glory *(Calystegia macrostegia* ssp *amplissima)*	-	4.3	G4G5T3/S3.3	Santa Barbara Island, San Clemente Island, San Nicolas Island	Coastal bluff scrub Coastal dunes Valley and foothill grassland	Abundant	Invasive non-native plants
Trask's cryptantha *(Cryptantha traskiae)*	-	1B.2	G2/S2.2	San Clemente Island and San Nicolas Island	Coastal bluff scrub Coastal dunes Coastal scrub	Occasional; sandy dunes, stabilized flats	Invasive non-native plants
island tarplant *(Deinandra clementina)*	-	4.3	G3/S3.3	Anacapa Island, Santa Barbara Island, San Clemente Island, Santa Catalina Island, and San Nicolas Island	Coastal bluff scrub Valley and foothill grassland	Abundant; slopes, flats, barren ridgetops, and canyon walls	Invasive non-native plants
beach spectacle-pod *(Dithyrea maritima)*	CT	1B.1	G2/S2.1		Coastal dunes Coastal scrub	Scarce; unstabilized sand dunes	Marine mammals, invasive species encroachment, habitat loss, and erosion.
bright green dudleya *(Dudleya virens* ssp.*Insularis)*	-	1B.2	G2T2/S2.2		Coastal bluff scrub Coastal scrub	Common	Invasive plants, marine mammal haul out expansion, climate change/sea-level rise.
San Nicolas Island buckwheat *(Eriogonum grande* var. *timorum)*	CE	1B.1	G3T1/S1.1	San Nicolas Island	Coastal bluff scrub	Abundant; dry slopes, canyon walls	Hybridizing with the introduced eriogonum sp. and erosion. Invasive non-native plants

Table 3-4. Special-status plant species on San Nicolas Island.

Species Name	State Listing	CNPS Status	Global/ State Rank	Channel Island Endemics, and Islands Occupied	Vegetation Community	Status on SNI	Expected Known Threats on SNI
island poppy *(Eschscholzia ramosa)*	-	4.3	G3/S3.3	Santa Barbara Island, San Clemente Island, Santa Catalina Island, Santa Cruz Island, San Miguel Island?, San Nicolas Island, Santa Rosa Island, and Isla Guadalupe - Baja	Coastal bluff scrub Chaparral Coastal scrub	Scarce, dry ridgetops, slopes, and flats	Invasive non-native plants and distribution is highly restricted and vulnerable to erosion.
Nevin's gilia *(Gilia nevinii)*	-	4.3	G3/S3.2	Anacapa Island, Santa Barbara Island, San Clemente Island, Santa Catalina Island, Santa Cruz Island, San Nicolas Island, Santa Rosa Island, and Isla Guadalupe - Baja	Coastal bluff scrub Coastal scrub Valley and foothill grassland	Rare; sandy sites	Invasive non-native plants.
vernal barley *(Hordeum intercedens)*	-	3.2	G3G4/ S3S4		Coastal dunes Coastal scrub Valley and foothill grass-land (saline flats and depressions) Vernal pools	Occasional; flats small depressions	Invasive non-native plants.
decumbent goldenbrush (*Isocoma menziesii* var. *decumbens*)	-	1B.2	G3G5T 2T3/S2 .2		Chaparral Coastal scrub (sandy often in disturbed areas)	Common; flats and coastal bluffs	Fire regime Invasive non-native plants
island jepsonia *(Jepsonia malvifolia)*	-	4.2	G3/S3.3	San Clemente Island, Santa Catalina Island, Santa Cruz Island, San Nicolas Island, Santa Rosa Island, and Isla Guadalupe - Baja	Chaparral Coastal scrub	Occasional; Clay slopes and canyon walls	Invasive non-native species.
island mallow *(Lavatera assurgentiflora)*	-	1B.1	G2T2/ S2.1	Anacapa Island, San Miguel Island, San Nicolas Island, and Santa Rosa Island	Coastal bluff scrub Coastal scrub/sandy or rocky	Rare; slopes and flats	Invasive non-native species.
San Nicolas Island lomatium *(Lomatium insulare)*	-	1B.2	G2/S2.1	San Clemente Island, San Nicolas Island, and Isla Guadalupe - Baja Endemic	Coastal bluff scrub	Abundant; open ridge-tops, flats, canyon bottoms, and slopes	Shrubland expansion? Invasive non-native plants
silver lotus *(Lotus argophyllus* var. *argenteus)*	-			Channel Islands Endemic except Santa Cruz		Abundant	Invasive non-native plants?
California box-thorn *(Lycium californicum)*	-	4.2	G4/S3.2		Coastal bluff scrub Coastal scrub	Abundant; eroded slopes, canyon rims, slopes, flats	Presumed extinct.
San Nicolas Island box-thorn *(Lycium verrucosum)*	-	1A	GXQ/SX	San Nicolas Island	Coastal Scrub	Rare; "arroya cliffs"	Erosion? Invasive non-native plants
San Nicolas Island malacothrix *(Malacothrix foliosa* ssp. *polycephala)*	-	4.2	G4T3/ S3.2	San Nicolas Island	Coastal Scrub	Abundant; stabilized dunes and sandy sites on flats	Invasive non-native plants
dunedelion *(Malacothrix incana)*	-	4.3	G3/S3.3		Coastal dunes Coastal scrub	Common; dunes, sandy terraces, and sandy flats	Invasive non-native plants.

Table 3-4. Special-status plant species on San Nicolas Island.

Species Name	State Listing	CNPS Status	Global/ State Rank	Channel Island Endemics, and Islands Occupied	Vegetation Community	Status on SNI	Expected Known Threats on SNI
island cliff-aster *(Malacothrix saxatilis* var. *implicata)*	-			Channel Islands		Common; canyons and slopes	Invasive non-native plants
short-lobed broom-rape *(Orobanche parishii* ssp. *brachyloba)*	-	4.2	G4?T3 /S3.2		Coastal bluff scrub Coastal dunes Coastal scrub	Common	Invasive plants and disturbance to host plant Isocoma.
woolly seablite *(Suaeda taxifolia)*	-	4.2	G3?/S 2S3		Coastal bluff scrub Coastal dunes Marshes and swamps (margins of coastal salt)	Occasional at low elevations, locally common	Sea-level rise. Invasive non-native plants
southern island clover *(Trifolium gracilentum* var. *palmeri)*	-	4.2	G5T3/ S3.2	Anacapa Island, Santa Barbara Island, San Clemente Island, Santa Catalina Island, San Nicolas Island, and Isla Guadalupe - Baja	Coastal bluff scrub Valley and foothill grassland	Occasional; moist slopes and flats	Invasive non-native plants

CNPS Ranking System

List 1A: Plants Presumed Extinct in California
List 1B: Plants Rare, Threatened, or Endangered in California and Elsewhere
List 2: Plants Rare, Threatened, or Endangered in California, But More Common Elsewhere
List 3: Plants About Which We Need More Information - A Review List
List 4: Plants of Limited Distribution - A Watch List

Threat Ranks

0.1-Seriously threatened in California (high degree/immediacy of threat)
0.2-Fairly threatened in California (moderate degree/immediacy of threat)
0.3-Not very threatened in California (low degree/immediacy of threats or no current threats known)

Nature Serve Conservation Status

G = Global; S = Subnational; T = Infraspecific Taxon; 1 = critically imperiled; 2 = imperiled; 3 = vulnerable; 4 = apparently secure; 5 = secure; X = presumed extinct; Q = questionable taxonomy; ? = inexact numeric rank

State Listing (CDFG)

CR = California Rare; CT = California Threatened; CE = California Endangered; PE: Presumed extinct (?).

3.8.2.2 Terrestrial Invertebrates

There are four special status terrestrial invertebrate species on SNI, including one beetle and three land snails (Table 3-5). The San Clemente Island coenonycha beetle (*Coenonycha clementina*) is a member of the Scarab Family (*Scarabeidae*). Scarab beetles are generally herbivores or frugivores, while the larvae are usually soil dwellers where they feed mostly on plant roots.

Table 3-5. Sensitive invertebrate species on San Nicolas Island.

Species name	CNDDB RANK	STATE	FED	IUCN
San Clemente Island coenonycha beetle† (*Coenonycha clementina*)	G1?S1?			
San Nicolas island snail† (*Micrarionta feralis*)	G1S1		FSC	VU
San Clemente island snail† (*Micrarionta gabbii*)	G1S1		FSC	VU
San Clemente Island blunt-top snail† (*Sterkia clementina*)	G1S1			NT

† = endemic to region (Bunn et al. 2007)

CNDDB RANKING STATUS:
GLOBAL RANKS: worldwide status of a full species: G1 to G5

G1 = extremely endangered: <6 viable occurrences (EOs) or <1,000 individuals, or <2,000 acres of occupied habitat
G2 = endangered: about 6-20 EOs, or 1,000 - 3,000 individuals, or 2,000 to 10,000 acres of occupied habitat
G3 = restricted range, rare: about 21-100 EOs, or 3,000-10,000 individuals, or 10,000-50,000 acres of occupied habitat
G4 = apparently secure: some factors exist to cause some concern such as narrow habitat or continuing threats
G5 = demonstrably secure: commonly found throughout its historic range

STATE RANKS: statewide status of a full species or a subspecies: 1 to 5, same general definitions as global ranks, but just for the range of the taxa within California.

? = inexact numeric rank (Note - Uncertainty about the rank of an element is expressed in two major ways: (1) By expressing the rank as a range of values) [e.g., S1S2 means the rank is somewhere between S1 and S2]; (2) By adding a ? to the rank [e.g., S1? represents more certainty than S1S2, but less than S2])

OTHER CODES:
FSB = Federal Species of Concern (former Category 2 species)
VU = IUCN Vulnerable species (A taxon is Vulnerable when it is not Critically Endangered or Endangered but is facing a high risk of extinction in the wild in the medium-term future)
NT = IUCN Near Threatened species (A taxon is Near Threatened when it has been evaluated against the criteria but does not qualify for Critically Endangered, Endangered or Vulnerable now, but is close to qualifying for or is likely to qualify for a threatened category in the near future)

The San Nicolas island snail was proposed for listing as endangered in 1976 (USFWS 1976), but ultimately was not listed as such. This species is known to occur in a highly restricted range on SNI (one km southwest of Nicktown). The principal threat to the species was feral goat grazing, but this threat has been eliminated. It remains vulnerable to military activities or other actions which may result in the introduction of exotic species or cause erosion. The San Clemente island snail (*Micrarionta gabbii*) inhabits temperate shrublands where its principal threat is habitat loss (Nature Serve 2009; IUCN 2010). The San Clemente Island blunt-top snail has a cylindrical shell with somewhat obtuse apex, and is 8 to 9 mm in diameter (Pilsbry 1921). Its color varies from cinnamon to cinnamon-buff. The two *Micrarionta* species have the familiar turban shape of the common garden snail, while the blunt-top snail has a more elongated profile.

3.8.2.3 Birds

The 1988 amendment to the Fish and Wildlife Conservation Act mandated the USFWS to "identify species, subspecies, and populations of all migratory non-game birds that, without additional conservation actions, are likely to become candidates for listing under the ESA of 1973." These species, subspecies, and populations are called Birds of Conservation Concern.

The double-crested cormorant (*Phalacrocorax auritus*) is the most numerous and most widely distributed species of the six North American cormorants. Double-crested cormorants have increased dramatically in coastal regions of California and Oregon because of reduced human disturbance, reduced levels of marine pollutants in southern California, and recent use of artificial nesting areas in San Francisco Bay and Columbia River estuaries (Gress *et al.* 1973; Carter *et al.* 1992). The southern California population has still not recovered to historical levels (Weseloh *et al.* 1999). The breeding population of double-crested cormorants was estimated to be 1,191 individuals on nearby Santa Barbara Island in 1991 (Carter *et al.* 1992).

Brandt's cormorant is endemic to North America, where it occurs only in marine and estuarine environments. It breeds along the West Coast of North America, reaching Alaska in the north and Mexico in the south. In the main part of its range, from California to Washington, its life history and populations are tied to the rich upwelling associated with the California current. In the non-breeding season, when the effects of this current diminish, populations redistribute along the coast in concert with changing water and feeding conditions. Current breeding populations within the SCB occur on SNI and Santa Barbara Island. San Nicolas Island has one of the largest breeding colonies in California estimated at 5,000 breeding pairs in 2006.

The California brown pelican has been delisted from the federal ESA and the California Endangered Species Act (CESA). It is one of two subspecies of brown pelicans residing in the United States and breeds along the Pacific coast from the Channel Islands to Mexico. Their number has increased recently at the two primary nesting colonies in the Channel Islands (West Anacapa and Santa Barbara Island) in southern California following severe pre-1975 declines primarily due to eggshell thinning from marine pollutants (Anderson *et al.* 1975; Anderson and Gress 1983; Carter *et al.* 1992; USFWS 2007). Breeding success is still low and limited recovery may involve immigration of birds out of Mexico. Although California populations have recovered substantially from previous declines, they continue to show inter-annual variation in productivity as related to prey availability (Anderson *et al.* 1982). Approximately 12,000 California brown pelicans breed in southern California and this represents nearly 12 percent of the western subspecies (Kushlan *et al.* 2002). The SCB provides extensive breeding and foraging territory for the California brown pelican including a large breeding population on Santa Barbara Island. California brown pelicans have not been documented nesting on SNI.

In May 2006, during surveys sponsored by the CDFG, 43 pelican nests were discovered on Prince Island near San Miguel Island. This is the first pelican nesting activity recorded at this location since 1939 (CDFG 2006). In 2006, a nesting colony was found, for the first time, on Middle Anacapa Island and breeders were observed on East Anacapa for the second time since 1928 (UCSC CIES 2006). Breeding populations on Santa Barbara and Anacapa Islands have increased annually since 2000 and are approaching 7,000 breeding pairs (CINP 2005). The USDON has conducted long term monitoring on San Nicolas Island tracking population trends and roosting habitat; approximately 5,000 birds currently roost on the island (Capitolo *et al.* 2007).

A petition to de-list the California brown pelican from the list of endangered or threatened species under the ESA was recorded in December 2005 which resulted in a delisting of the brown pelican in November 2009. According to the USFWS, "the population has remained stable for at least 20 years within its entire range" (USFWS 2007).

Cassin's auklet populations, like other auklets and murrelets in California have declined and several historic colonies have disappeared altogether, mainly from predation (Manuwal and Thorensen 1993). On SNI, small numbers of Cassin's auklets have been observed in nearshore waters year round. Rhinoceros auklets, a medium-sized auk, closely related to the puffins (*Fratercula*), breeds along the Pacific coast of North America from the Aleutian Islands, Alaska, south to southern California (Gaston and Dechesne 1996). The current status of southern California breeding populations is not well known and is likely restricted to the northern Channel Islands. California numbers remain low; the most recent counts estimate approximately 1,700 individuals now breeding in California (Carter *et al.* 1992). Small numbers of rhinoceros auklets are year round residents in waters adjacent to SNI.

Xantus's murrelets populations persist in very low numbers throughout their range. About 2,000-5,000 individuals of the breeding population are documented in southern California. The world population of Xantus's murrelets is concentrated in four major breeding colonies. Santa Barbara Island and Islas Los Coronados support the great majority of Xantus's murrelet in southern California and northern Baja California. The species has been extirpated on some of the Baja California islands by introduced cats and other predators, and it is threatened on other islands. The most recent population estimates for southern California are 1,544 breeding individuals at Santa Barbara Island (Carter *et al.* 1992). On SNI, Xantus's murrelets are perennial visitors in nearshore waters around the island. In 1991, Xantus's murrelets were first proposed for ESA candidacy, and are discussed in detail in *Section 3.8.1: Federally Listed Species and Critical Habitat.*

The pigeon guillemot is found along rocky coastlines between Alaska and California. This alcid nests in burrows or in rock cavities, mostly on small islands that provide protection from predators. A significant population and new nesting areas have been found recently in southern California, although higher numbers may reflect both better survey techniques and population increases (Carter *et al.* 1992). Unlike other alcids that fly 32 to 54 nm (60 to 100 km) out to sea to find fish schools, the pigeon guillemot stays close to the rocky coast and searches for fish prey in relatively shallow waters and within approximately 5.4 nm (10 km) of their nest. The estimated population of this species is about 235,000, with the largest breeding concentrations on Farallon Island, California. The most current population estimate for the SCB is 284 breeding individuals at Santa Barbara Island (Carter *et al.* 1992).

In the SCB, the ashy storm-petrel is known to breed on Santa Catalina, Santa Barbara and SCI. The majority of the ashy storm-petrel population breeds in coastal and island areas of central and southern California (McChesney *et al.* 2000; Ainley *et al.* 1995). Nearly 1,500 breeding individuals were documented on Santa Barbara Island in 1992 (Carter *et al.* 1992) and 2,252 breeding birds or about 1,126 nests in 1996. Breeding populations on SCI and Santa Catalina Island have not been accurately enumerated since Carter *et al.* (1992), and their current status remains unknown as of the date of this research. The rare sightings at SNI have been of storm-petrels either foraging or resting in nearshore waters of the island.

Table 3-6 shows the special status avian species and their use on SNI.

Table 3-6. Special status avian species and their use on San Nicolas Island .

Common Name (Scientific Name)	Status*	Use of San Nicolas Island
ANATIDAE (DUCK, GEESE, AND SWANS)		
brant (*Branta bernicla)*	BSSC	Transient, rare spring migrant and extremely rare fall migrant
GAVIIDAE (LOONS)		
common loon (*Gavia immer)*	BSSC	Winter visitor: Summer visitor, extremely rare
DIOMEDEIDAE (ALBATROSSES)		
Laysan albatross (*Phoebastria immutabilis)*	BCC	Transient, extremely rare
PROCELLARIIDAE (SHEARWATERS AND PETRELS)		
pink-footed shearwater *(Puffinus creatopus)*	BSSC	Summer visitor, common
HYDROBATIDAE (STORM-PETRELS)		
ashy storm-petrel (*Oceanodroma homochroa)*	ESA Candidate, BSSC	Transient, extremely rare
black storm-petrel (*Oceanodroma melania)*	BSSC	Transient, extremely rare
PELECANIDAE (PELICANS)		
California brown pelican (*Pelecanus occidentalis californicus)*	Federally and State Delisted	Resident, abundant, historically breeds on SNI
ACCIPITRIDAE (KITES, EAGLES ANDHAWKS)		
bald eagle (*Haliaeetus leucocephalus)*	BCC, SE	Winter visitor, uncommon, extirpated
northern harrier (*Circus cyaneus)*	BSSC	Winter visitor, uncommon
FALCONIDAE (FALCONS)		
peregrine falcon (*Falco peregrinus)*	Recovered, BCC, SE, CFP	Winter visitor, uncommon
prairie falcon (*Falco mexicanus)*	BSSC, BCC	Transient, extremely rare fall migrant
CHARADRIIDAE (LAPWINGS AND PLOVERS)		
Pacific golden-plover (*Pluvialis fulva)*	HC	Winter visitor, uncommon
western snowy plover (*Charadrius alexandrinus nivosus)*	FT, BSSC, HI	Resident, common, breeds on SNI
mountain plover (*Charadrius montanus)*	BCC, BSSC, HI, BLMS	Winter resident, uncommon
HAEMATOPODIDAE (OYSTERCATCHERS)		

BCC = Bird of Conservation Concern (USFWS 2008), BSSC = California Bird Species of Special Concern (CDFG 2008), FT = Federally Threatened, SE = State Endangered, ST = State Threatened (CDFG 2010), HI=U.S. Shorebird Conservation Plan (Brown et al. 2001) High Priority Shorebirds: HC=High Concern global, HCN=High Concern North American Population, HI=Highly Imperiled, BLMS= Bureau of Land Management Sensitive Species

Inventory of species based on Santa Barbara Museum of Natural History September 2000 Birds Species Checklist

Table 3-6. Special status avian species and their use on San Nicolas Island (Continued).

Common Name (Scientific Name)	Status*	Use of San Nicolas Island
American oystercatcher *(Haematopus palliatus)*	HC	Resident, rare, unknown but possible breeds on SNI
black oystercatcher (*Haematopus bachmani)*	BSSC	Resident, uncommon, breeds on SNI
SCOLOPACIDAE (SANDPIPERS, PHALAROPES, AND ALLIES)		
solitary sandpiper (*Tringa solitaria)*	HC	Transient, extremely rare
whimbrel *(Numenius phaeopus)*	HCN	Winter visitor: Summer visitor, rare
long-billed curlew (*Numenius americanus)*	BCC	Winter visitor, rare
Hudsonian godwit (*Limosa haemastica)*	HC	Transient, rare
marbled godwit (*Limosa fedoa)*	HC, BCC	Winter visitor, common: Summer visitor, uncommon
ruddy turnstone *(Arenaria interpres)*	HCN	Winter visitor, uncommon: Summer visitor, rare
black turnstone (*Arenaria melanocephala)*	HC	Winter visitor, common: Summer visitor, uncommon
red knot (*Calidris canutus)*	HCN	Transient, extremely rare fall migrant
sanderling (*Calidris alba)*	HCN	Transient, common: Winter resident, uncommon
western sandpiper *(Calidris mauri)*	HC	Transient, common fall migrant: Winter visitor uncommon
dunlin *(Calidris alpine)*	HCN	Transient, possible winter resident
short-billed dowitcher (*Limnodromus griseus)*	HC	Transient, rare fall migrant: Transient, extremely rare spring migrant
Wilson's phalarope (*Phalaropus tricolor)*	HCN	Transient, rare fall and extremely rare spring migrant
LARIDAE (GULLS, TERNS AND SKIMMERS)		
Caspian tern (*Hydroprogne caspia)*	BCC	Transient, extremely rare
royal tern (*Thalasseus maximus)*	BSSC	Winter visitor, common: Summer visitor, uncommon
elegant tern (*Thalasseus elegans)*	BCC, BSSC	Transient, extremely rare
black skimmer (*Rhynchops niger)*	BCC, BSSC	Transient, extremely rare
ALCIDAE (MURRELETS AND AUKLETS)		
Xantus's murrelet *(Synthliboramphus hypoleucus)*	ESA candidate, BCC, ST	Perennial visitor, extremely rare
Cassin's auklet (*Ptychoramphus aleuticus)*	BCC, BSSC	Resident, rare
rhinoceros auklet (*Cerorhina monocerata)*	BSSC	Resident, rare
CUCULIDAE (CUCKOOS)		
yellow-billed cuckoo (*Coccyzus americanus)*	BCC,SE	Transient, extremely rare
STRIGIDAE (OWLS)		
burrowing owl (*Athene cuicularium)*	BCC, BSSC,BLMS	Winter visitor, uncommon
long-eared owl (*Asio otus)*	BSSC	Transient, extremely rare fall migrant
short-eared owl (*Asio flammeus)*	BSSC	Transient, extremely rare
APODIDAE (SWIFTS)		
black swift (*Cypseloides niger)*	BCC, BSSC	Transient, extremely rare spring migrant
Vaux's swift (*Chaetura vauxi)*	BSSC	Transient, extremely rare fall migrant
TROCHILIDAE (HUMMINGBIRDS)		
Costa's hummingbird (*Calypte costae)*	BCC	Transient, extremely rare spring and fall migrant
Allen's hummingbird (*Selasphorus sasin)*	BCC	Transient, rare spring migrant: Transient, extremely rare fall migrant
PICIDAE (WOODPECKERS)		
Lewis's woodpecker (*Melanerpes lewis)*	BCC	Transient, extremely rare
TYRANNIDAE (TYRANT FLYCATCHERS)		
olive-sided flycatcher (*Contopus cooperi)*	BCC, BSSC	Transient, rare
willow flycatcher (*Empidonax traillii)*	SE	Transient, rare
vermillion flycatcher *(Pyrocephalus rubinus)*	BSSC	Transient, extremely rare fall migrant
LANIIDAE (SHRIKES)		

BCC = Bird of Conservation Concern (USFWS 2008), BSSC = California Bird Species of Special Concern (CDFG 2008), FT = Federally Threatened, SE = State Endangered, ST = State Threatened (CDFG 2010), HI=U.S. Shorebird Conservation Plan (Brown et al. 2001) High Priority Shorebirds: HC=High Concern global, HCN=High Concern North American Population, HI=Highly Imperiled, BLMS= Bureau of Land Management Sensitive Species

Inventory of species based on Santa Barbara Museum of Natural History September 2000 Birds Species Checklist

Table 3-6. Special status avian species and their use on San Nicolas Island (Continued).

Common Name (Scientific Name)	Status*	Use of San Nicolas Island
loggerhead shrike (*Lanius ludovicianus)*	BCC, BSSC	Winter visitor, rare
HIRUNDINIDAE (MARTINS AND SWALLOWS)		
purple martin (*Progne subis)*	BSSC	Transient, extremely rare fall migrant
MIMIDAE (MOCKINGBIRDS AND THRASHERS)		
Bendire's thrasher (*Toxostoma bendirei)*	BCC, BSSC, BLMS	Transient, extremely rare
PARULIDAE (WOOD WARBLERS)		
Lucy's warbler (*Oreothlypis luciae)*	BCC, BSSC	Transient, extremely rare
yellow warbler *(Dendroica petechia)*	BSSC	Transient, common
yellow-breasted chat *(Icteria virens)*	BSSC	Transient, uncommon fall migrant: Transient, rare spring migrant
EMBERIZIDAE (TOWHEES AND SPARROWS)		
green-tailed towhee (*Pipilo chlorurus)*	BCC	Transient, rare
spotted towhee (*Pipilo maculatus)*	BCC	Transient, uncommon: Winter visitor, rare
black-chinned sparrow (*Spizella atrogularis)*	BCC	Transient, extremely rare fall migrant
Savannah sparrow (*Passerculus sandwichensis)*	Depends on subspecies	Transient, common fall migrant: Winter visitor, uncommon
grasshopper sparrow (*Ammodramus savannarum)*	BSSC	Transient, extremely rare
song sparrow (*Melospiza melodia)*	Depends on subspecies	Transient, rare
CARDINALIDAE (GROSBEAKS, BUNTINGS, AND ALLIES)		
summer tanager *(Piranga rubra)*	BSSC	Transient, extremely rare
ICTERIDAE (BLACKBIRDS AND ORIOLES)		
tri-colored blackbird (*Agelaius tricolor)*	BCC, BSSC	Transient, extremely rare fall migrant
yellow-headed blackbird (*Xanthocephalus xanthocephalus)*	BSSC	Transient, uncommon
FRINGILLIDAE (FINCHES AND ALLIES)		
Lawrence's goldfinch (*Spinus lawrencei)*	BCC	Transient, rare

BCC = Bird of Conservation Concern (USFWS 2008), BSSC = California Bird Species of Special Concern (CDFG 2008), FT = Federally Threatened, SE = State Endangered, ST = State Threatened (CDFG 2010), HI=U.S. Shorebird Conservation Plan (Brown et al. 2001) High Priority Shorebirds: HC=High Concern global, HCN=High Concern North American Population, HI=Highly Imperiled, BLMS= Bureau of Land Management Sensitive Species

Inventory of species based on Santa Barbara Museum of Natural History September 2000 Birds Species Checklist

3.8.2.4 Mammals

Table 3-7 shows special status mammals occurring on SNI.

Table 3-7. Special status mammals of San Nicolas Island (CNDDB 2009).

Species Name	Status	Status on San Nicolas Island
San Nicolas Island fox (*Urocyon littoralis dickeyi*)	ST	Fairly common (~500 individuals) resident in terrestrial habitats over entire island.
San Nicolas Island deer mouse (*Peromyscus maniculatus*)	SS	Fairly common resident in terrestrial habitats over entire island.
Southern sea otter (*Enhydra lutris nereis*)	FT *	Rare (30-40 individuals) year-round resident in nearshore marine environment, experimental reintroduced population.

SE = State Endangered, ST = State Threatened, SS = Sensitive Species

FT* = While the Southern sea otter is designated as Federally Threatened, the population surrounding SNI is designated as a non-essential experimental population and is treated as a species proposed for listing with regards to military activities in the region. For more information on the status of the SNI Southern sea otter population refer to PL 99-625 and Title 50, CFR, 17.84(d).

San Nicolas Island Fox (*Urocyon littoralis dickeyi*)

The island fox was listed as state threatened in 1971. It is restricted to the Channel Islands and is endemic to the region (Bunn *et al.* 2007), where an endemic subspecies occurs on all but two of the islands (Anacapa and Santa Barbara). San Nicolas Island foxes are omnivorous, foraging on insects, vegetation, mice, and seasonally available bird eggs. Island foxes are generally monogamous, and breed only once per year. Pairs are together frequently beginning in January; they mate in late February to early March, and pups are born from late April through early May. Litter size ranges from one to five pups, but two or three is average. Pups emerge from the den at about one month of age and undergo a period of extended parental care.

In early 2000, foxes on SNI (*U. l. dickeyi*) and those on SCI (*U. l. clemente*) were considered to be the only subspecies maintaining viable populations (Suckling and Garcelon 2000). The four remaining subspecies suffered marked declines in the mid to late 1990s caused by predation and canine distemper. In the summer of 2000, the Institute for Wildlife Studies (IWS) began a fox-monitoring program on SNI by establishing three capture-recapture trapping grids to evaluate the current status and demography of the subspecies and to monitor changes in population parameters. Trapping on the grids has been repeated each year since 2000 (Juola *et al.* 2002; Schmidt and Garcelon 2003, 2004; Garcelon and Schmidt 2005; Schmidt *et al.* 2006, 2007; Garcelon and Hudgens 2009).

Fox sampling (trapping) grids were established within three distinct habitat types that represent the dominant floral communities that occur on SNI. Annual sampling grids are well distributed throughout the island and represent coastal scrub and inland dune habitats (Redeye grid), coastal scrub (Tuft's grid), and grassland and coastal scrub (Skyline grid). Two of the fox grids maintain some of the highest densities ever recorded for island foxes on any of the Channel Islands (15.8–26.3 foxes/km^2; Schmidt *et al.* 2007). Based on capture histories and telemetry data, individual foxes can range widely across the island (D. Garcelon, *pers. comm.*, 2009). The extrapolated population size estimate, based on data from the trapping grids, has averaged 461 ± 60.95 for the period from 2000 through 2006, with a low of 385 in 2001 and a high of 542 in 2006 (Schmidt *et al.* 2007). As of 2009 adult fox population size estimates by grid ranged from 23 on the Skyline grid to 80 on the Redeye grid. Population size estimates for 2009 indicate that the number of adult foxes on the grids increased from 2008 for both Redeye and Tuft's, but decreased on Skyline for the second consecutive year. The mean annual rate of adult population change for 2000-2008 was >1 for all grids (Garcelon and Hudgens 2009).

Of the six fox populations in the Channel Islands, only the SNI and SCI fox populations are not listed as federally endangered. However, after a period of rapid population decline the other four populations are increasing in numbers and captive breeding efforts have been discontinued. The SNI fox population is not currently affected by factors that have caused other fox populations to decline, such as canine distemper disease and predation by golden eagles (*Aquila chrysaetos*) (Roemer *et al.* 2004; Clifford *et al.* 2006; Schmidt *et al.* 2007), but vehicular traffic incidents are a major source of mortality (Roemer *et al.* 2004). The population size of the San Nicolas Island fox has been highly variable. More recently, the population has been relatively stable (Schmidt *et al.* 2007). Its insular nature, lack of resistance to canine distemper and other diseases, high densities, and low genetic variability increase the vulnerability of this subspecies to decline (USFWS 2004).

San Nicolas Island Deer Mouse (*Peromyscus maniculatus exterus*)

On SNI, the San Nicolas Island deer mouse is the only native rodent species and abundance of this endemic subspecies fluctuates yearly based on environmental conditions and reproductive cycles. The status of island populations is based on intermittent monitoring events performed by island staff and visiting researchers. San Nicolas Island deer mouse populations have only been generally quantified in terms of abundance and not formal population estimate reported. Overall the deer mouse population has remained relatively stable in lieu of the non native cat population currently being removed (G. Smith, *pers. comm.*, 2009). The trap grid surveys and observations of island biologists have documented a healthy and dispersed deer mouse population throughout the island and ancillary research has primarily focused on biogeorgraphic genetics associated with the adjacent channel islands and species origin.

Southern Sea Otter (*Enhydra lutris nereis*)

The population of southern sea otters historically ranged from northern California or southern Oregon to approximately Punta Abreojos, Baja California (Wilson *et al.* 1991). Currently the southern sea otter's primary range is restricted to the coastal area of central California, from Half Moon Bay to Gaviota, located just south of Point Conception (Orr and Helm 1989), plus a small translocated population (currently about 29 animals) around San Nicolas Island (Ralls *et al.* 1995; USFWS 1987a, 1987b, 1988, 2003).

Sea otters prefer rocky shorelines with kelp beds and waters about 66 feet (20 m) deep (USFWS 2003). Few sea otters venture beyond 5,200 feet (1,600 m) from shore, and most remain within 1,600 feet (500 m) (Estes and Jameson 1988). They require a high intake of energy to satisfy their metabolic requirements. Sea otters feed on or near the bottom in shallow waters, often in kelp beds feeding on primarily benthic invertebrates such as abalones, sea urchins, and rock crabs. Sea otters also eat other types of shellfish, cephalopods, and sluggish near-bottom fishes. The diet varies with the physical and biological characteristics of the habitats in which they live (Estes and Bodkin 2002). Most sea otters in California tend to be active at night and rest in the middle of the day (Ralls and Siniff 1990), but there is extensive variation in the activity of individuals both among and within age and sex classes (Ralls *et al.* 1995). Sea otters breed throughout their range and have two peaks in pupping , January to March and October (USFWS 2003).

Harvest of sea otters during the 1700s and 1800s reduced the species throughout its range. In 1974, the total California population was estimated to be about 50 animals. The small size and limited range of the sea otter population, along with the otter's vulnerability to mortality from oil spills, were the main factors that resulted in listing it as federally threatened in 1977. Between 1987 and 1990, the USFWS translocated 139 sea otters to SNI (USFWS 1987a, 1987b, 1988). Currently the sea otter population is estimated to be 3,026 from the spring 2007 survey, an increase of 12.4 percent from 2006 (Hatfield 2007). Acanthocephalan parasites (worms) in the intestines, *Toxoplasma gondii encephalitis* (single cell parasite), and shark attacks are the main causes of mortality in sea otters (Kreuder *et al.* 2003; Johnson *et al.* 2009) and are likely responsible for the slow growth and periods of decline in the sea otter population (Estes *et al.* 2003; USFWS 2009b).

In 2008, a stable population of 30 to 40 adults was distributed in the nearshore waters primarily along the western and northern shoreline of SNI; refer to marine mammal haul out locations in Map 3-8. Map 3-12 shows sea otter habitat surrounding SNI based on CNDDB records from late 2009.

3.9 Invasive Plants

Executive Order 13112 defines an invasive species as "an alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health." Non-native invasive plants pose a serious threat to native ecosystems. The relatively mild climate throughout much of southern California provides suitable conditions for invasive plants from other areas to invade native ecosystems. Invasive plants can alter ecosystem processes, transport disease, interfere with reproduction, or cause cascading impacts to native animal populations, potentially impacting multiple trophic levels.

Whether introduced unknowingly by early settlers 200 years ago, or more recently by global commerce and travel, the spread of non-native invasive plants throughout California is reaching levels in some cases that pose long-term, far-reaching threats to ecosystems. Without the natural enemies of their original habitats, non-native invasive species can spread rapidly and out-compete California native plant species, thereby, degrading natural ecosystem processes. The introduction and spread of non-native plants has profoundly affected the composition of plant communities and has threatened the status of individual species on SNI. Historic land uses prior to Navy

occupation have certainly contributed to the majority of non-native invasive plant introductions on SNI while some have likely been imported inadvertently with materials and equipment used in Navy construction projects. Most of the non-native taxa are native to the Mediterranean region (Europe, north Africa, and west Asia) or Australia (Junak 2008).

In 2008 known flora of SNI consisted of 278 taxa. Of these, 141 had been introduced. Of all the Channel Islands, SNI has the highest percentage (51%) of introduced plant species (Junak 2008). In contrast, 19 non-native species were documented during the period from 1890-1899. A Resource Conservation District (RCD) Weed Eradication Plan was developed with the support of the USSCS and has been implemented at SNI. The Weed Eradication Plan supplements an alien (invasive) plant removal plan developed by natural resource staff in the early 1990s. Task orders have been developed to implement the current Weed Eradication Plan by eradicating highly invasive non-native plant species. Initial non-native plant control treatments on SNI were carried out by Agri Chemical and Supply Inc. in May 2001; follow up treatments were carried out in July 2002, June 2003, June 2005, May 2006, and May 2008 (Agri Chemical and Supply Inc. 2009).

3.10 Invasive Wildlife Damage

The introduction of non-native rodents, especially black rats, Norway rats, or house mice, could have a devastating impact on the island ecosystem. Invasion by these species could severely impact ground nesting seabirds, resident land birds and the endemic Channel Islands deer mouse (USDON 2005a). Trapping incidental to other activities (hanta virus studies, deer mouse population monitoring, removal of mice from living quarters, site specific rodent trapping for rats) has not revealed any rodents except for the native deer mouse. However, shipwrecks, a known route for introducing rodents on islands, have been documented.

The invasive terrestrial invertebrate species that occur on SNI may include, but are not limited to decollate snails, european garden snails, and argentine ants. At least two introduced non-native snail species, the European garden snail and the predatory decollate snail are present on SNI and may pose a threat to the small remnant population of terrestrial land snails on SNI. Argentine ants (*Linepithema humile*) also occur on SNI and are an invasive non-native species that are a known threat to endemic wildlife populations and also prey upon other ant species.

The invasive terrestrial vertebrate species that occur on SNI may include, but are not limited to chukar and feral cats. Established populations of chukar are present on SNI; although used for hunting on the mainland there is no hunting permitted on SNI so it may be considered an invasive species rather than a game species. Chukar may have impacts to sensitive flora as well as lead to the dispersal of weedy plants.

To protect the island's native fauna, the Navy has funded intermittent efforts to control feral cats since the 1980s. Through funding under the Montrose restoration settlement, cat removal efforts began in June 2009. An adaptive management approach is being used, which involves careful monitoring of the project and the effectiveness of each method to maximize efficiency and humaneness of the effort (USFWS 2009a).

Feral cats are among the most detrimental of invasive species, causing population decline, extirpation, and extinction in a diverse array of animals, including insects, reptiles, birds, and mammals (Lowe *et al.* 2000; Nogales *et al.* 2004). The effects of feral cats are particularly severe on islands (Whittaker 1998). Cats have had detrimental impacts on SNI vertebrate and invertebrate populations including various land birds, seabirds, the San Nicolas Island deer mouse, the state threatened San Nicolas Island fox, the federally listed island night lizard, the western snowy plover, and seabird colonies. Considering the limited resources available for vertebrate predators within an island ecosystem competition between native and non-native species is a considerable concern. A feral cat removal program has been conducted on SNI based on these threats and concerns.

To protect the Island's native fauna, the Navy has funded intermittent efforts to control feral cats since the 1980s (USFWS 2009). The most recent feral cat removal program was conducted from 2009-2010 in four phases (USDON 2007):

- Phase 1 - Project approval and planning phase,
- Phase 2 - Preparatory phase,
- Phase 3 - Eradication phase, and
- Phase 4 - Monitoring/Confirming eradication phase.

The primary removal method at SNI during the eradication phase was live trapping in conjunction with a trap monitoring system that would minimize the time animals are held in traps. A field study on SNI conducted in 2006 demonstrated that padded leghold live traps can be used to trap feral cats effectively with minimal injury to cats and foxes (USFWS 2009). A similar Pilot Program conducted in late 2008 with the Humane Society of the United States (HSUS) tested the efficacy of cage traps (USFWS 2009). Hunting with and without specialized tracking dogs was also used strategically as a supplemental removal method. Monitoring trips were also conducted at set intervals after the main removal campaign was completed to confirm that all feral cats have been removed from SNI.

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4.0 Natural Resource Management Objectives and Strategies

4.1 Ecosystem Approach

Specific Concerns

- On the terrestrial side, SNI continues to be in a state of recovery from historic grazing pressure which resulted in evident soil losses and long-term change in plant communities.
- Major stressors affecting marine wildlife and their habitats in marine areas of California including the Channel Islands are: overfishing, degradation of marine habitats, invasive species, pollution, and human disturbance. All of these are regional rather than local issues.
- There are a number of known threats that are difficult to address for any one jurisdiction in isolation. Examples are: climate change, invasive species, air pollution, and oil pollution. No partnerships are in place to jointly identify such threats.
- The complexity of island communities and the difficulty of dealing with this complexity argues for the use of management indicator (emphasis/focus) species to provide a basis for decision-making, and these have not been identified by agreement within the Navy or among agencies. Since it is impossible to measure and monitor the effects of management practices on all species, a suite of processes and species should be identified to serve as ecosystem indicators. The challenge of managers is to determine which indicators characterize the system yet are simple enough to be effectively monitored and modeled.
- Significant ecosystem changes are anticipated for SNI based on predictions for sea level rise and increased air and sea surface temperature.
- Plant community or habitat metrics for SNI are not identified; such as the mix of expected species when a site is healthy or damaged, soil condition, or the status of a management focus species.
- The current long-term monitoring program does not sufficiently inform managers as to habitat health and threats.

Current Management

Ecosystem management became a national initiative in the 1990s as a conceptual model in reaction to deficiencies of the more traditional approaches that were too narrow in scope. An interagency MOU was signed by USDOD along with 14 other agencies in an attempt to create a more consistent approach to ecosystem management among federal agencies, enhance coordination, and to encourage more regional ecosystem initiatives (CEQ *et al.* 1995). The USDOD's Ecosystem Initiative states that "ecosystem management is a process that considers the environment as a complex system functioning as a whole, not as a collection of parts, and recognizes that people and their communities are part of the whole" (Keystone Center 1996; Benton *et al.* 2008). This approach shall take a long-term view of human activities, including military uses, and biological resources as part of the same environment.

■ **For more information on the SAIA or USDODINST 4715.3 see Appendix B, *Section B.1: Federal Laws*.**

This INRMP complies with federal guidelines regarding adoption of an ecosystem approach to land and water management. The Navy is required to ensure that ecosystem management is the basis for all management of its land and waters (OUSD Memo of 08 August 1994, *Implementation of Ecosystem Management in the Department of Defense).* In addition, the SAIA states that the INRMP goals "shall be to maintain or develop an ecosystem-based conservation program…" USDODINST 4715.3 Environmental Conservation Program (03 May 1996) requires that U.S. Navy installations incorporate ecosystem management's "ten guiding principles." These principles and guidelines are generally acceptable to academicians and practitioners alike, and they provide more specific guidelines to installation managers. It also provides a USDOD definition of ecosystem management as, "a goal-driven approach to managing natural and cultural resources that supports present and future mission requirements; preserves ecosystem integrity; is at a scale compatible with natural process; is cognizant of nature's time frames; recognizes social and economic viability within functioning ecosystems; is adaptable to complex changing requirements; and is realized through effective partnerships among private, local, state, tribal, and federal interests."

Additionally, SNI waters are considered EFH by NMFS. The Magnuson-Stevens Fishery Conservation and Management Act assigns NMFS the responsibility for identifying EFH for all species which are federally managed, and for determining whether projects or activities adversely impact EFH zones. According to this Act, EFH is defined as those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. For more information regarding the means by which NMFS can recommend conservation measures for projects that may adversely affect EFH see Appendix B, *Section B.1: Federal Laws*.

The ten guiding principles of ecosystem management in USDOD are as follows (USDODINST 4715.3, 03 May 1996):

1. Maintain and improve the sustainability and native biodiversity of ecosystems.
2. Administer with consideration of ecological units and timeframes.
3. Support sustainable human activities.
4. Develop a vision of ecosystem health.
5. Develop priorities and reconcile conflicts.
6. Develop coordinated approaches to work toward ecosystem health.
7. Rely on the best science and data available.
8. Use benchmarks to monitor and evaluate outcomes.
9. Use adaptive management.
10. Implement through installation plans and programs.

■ **For more information on OPNAVINST 5090.1C refer see Appendix B, *Section B.1: Federal Laws*.**

Finally, the Navy directs through OPNAVINST 5090.1C that ecosystem-based management shall include: a shift from single species to multiple species conservation; formation of partnerships necessary to consider and manage ecosystems that cross boundaries; and the use of best available scientific information and adaptive management techniques.

Current management of natural resources at SNI tends to be project or species-based, and generally within annual to three-year budget cycles. Current natural resource management at SNI includes but is not limited to the following activities:

- Development of the NBVC Point Mugu Range Capabilities Master Plan (RCMP) to examine land use on a broader scale;
- Participation in a Channel Islands symposium;
- Cooperation in seabird restoration and feral cat removal through the Montrose Settlement;
- Support CDFG monitoring and research on seabird populations;
- Support NOAA monitoring and research for aerial marine mammal surveys;
- Collaborate and participate with USFWS for western snowy plover monitoring and land bird surveys;
- Collaborate with the USGS for island night lizard monitoring and development of long term vegetation monitoring plots;

- Support cooperative agreements with universities for research;
- Support research from non-profit scientific organizations such as the Santa Barbara Museum of Natural History and the Santa Barbara Botanic Garden; and
- Collaborate as a steward with the BLM to manage the offshore rocks of SNI and Begg Rock that are included within the jurisdiction of the CCNM.

Current research and monitoring efforts are also generally driven by the need for impact assessment under the ESA or NEPA. Past management techniques have used single species management with the assumption that protection of one species will act as an umbrella to protect other similar species in the environment.

Assessment of Current Management at SNI

A premise of this INRMP is that management on a project-by-project basis is inadequate to manage ecosystem integrity because the scale and time frame associated with projects is unlikely to consider all the resources, processes, and interdependencies that may be affected. At the same time, viewing issues on an ecosystem level may allow some important management concerns to fall through the cracks.

Generally, the idea of an ecosystem approach is to identify a process or a species that indicates the "health" of a system, but there are differing definitions of ecosystem health. Ideally the suite of indicators should represent key information about structure, function, and composition of the ecosystem (Dale and Beyeler 2001). For example, to determine the energy flow of an ecosystem, one might decide that the number of trophic levels would be a good indicator to determine "health" of the system.

One goal of this plan should be to prevent species and processes that are currently healthy from becoming threatened and unbalancing the ecosystem. Thus, some healthy processes and species populations must be monitored and managed.

The general synopsis of the elements to be included in this INRMP to promote an ecosystem approach for natural resource management at SNI is: habitat first, use of focal management species, partnerships, and adaptive management.

Management Strategy

Objectives and Strategies for an Ecosystem Approach

Objective: Conserve ecosystem resources by planning and acting at ecologically meaningful spatial scales and time frames.

I. Maintain and improve the sustainability and integrity of the ecosystem by planning and managing at key ecological scales: regional; island-wide; by species group and habitat needs; by management focus species representing different scales used by wildlife or different ecological functions (such as migratory species support versus species that are tied to a very specific and localized set of habitat conditions).

II. Implement an approach based on habitats to terrestrial and aquatic management. Conserving habitats and communities is more biologically prudent and scientifically sound than managing individual species one at a time.

A. Develop, implement, and enforce bio-security and invasive species objectives and strategies.

- **Refer to *Section 4.6: Invasive Exotic Species* for more information concerning bio-security and invasive species objectives and strategies.**

B. Ensure that habitats are able to sustain viable populations of special status species.

1. Ensure habitats have all essential elements to maintain productivity and soil stability.

2. Avoid or minimize disturbance outside of a site's natural ability to recover.

III. Ensure endemic species are self-sustaining in order to protect biodiversity and prevent future listings under the ESA.

- **Refer to *Section 4.5: Special Status Species Protection* for more information concerning the use of management focus species.**

A. Adopt a map of priority management emphasis areas for management focus species. These areas are designed such that threatened and endangered species are provided for with a minimum of conflict with the military mission.

B. Define the habitat needs of management focus species, considering the full range of plant community composition and structural conditions found historically in the area, rather than any one set of habitat conditions.

C. Investigate use of management focus species to assist managers in determining that the ecosystem is properly functioning and that natural biodiversity is provided for.

IV. Research effects from long-term regional change including but not limited to climate change.

V. Participate in or ensure consistency with regional monitoring protocols in order to derive additional interpretive power from Navy data sets.

A. Support cooperative research ventures with schools, universities, and nonprofit scientific research organizations.

VI. Rely on the best science and data available to collect and analyze data for SNI's ecosystems

VII. Apply sustainability principles to the management of habitats, species, and ecological functions on SNI by identifying resource-specific best practices similar to what has been done for energy and water in the built environment (*Section 5.1.3*) using Sustainable Sites Initiative (SSI) principles and following the SNI landscaping plan.

VIII. Use construction siting, materials, and methods that promote biotic communities to the fullest extent possible.

A. Ensure for design review by engineers, water quality specialists, and marine biologists at all major phases of intertidal and subtidal construction project development.

B. Design substrates that are amenable to occupation by intertidal and subtidal biota during the refurbishment and construction of new armored shorelines as implemented in the Military Construction Projects (MILCON) P-793 Navy Lighterage Project.

C. Design against the occupation of shoreline stabilizing structures by terrestrial predators that can negatively impact the success of endangered species programs.

4.2 Managing the Physical and Chemical Environment

4.2.1 Water Resources and Water Quality

Specific Concerns

- The inland surface waters and groundwater resources are vulnerable.
- The expansion of the RO plant raised compliance concerns from the brine discharge line into the ASBS.
- Storm water runoff and erosion has the potential to degrade SNI nearshore water quality, and these waters surrounding SNI and Begg Rock are designated as an ASBS by the SWRCB. The ASBS water quality designation is another level of water quality protection for which sedimentation into ocean waters should be considered an important priority.

- SNI's renowned, abundant marine life, while generally only indirectly affected by military activity, requires consideration in daily management for compliance with CWA requirements, as well as for NEPA and Magnuson-Stevenson Act compliance.
- Development and maintenance of facilities can increase erosion, affect water quality, and disturb sensitive species which inhabit these areas. Storm water management approaches that maintain water quality are most important in the interface between the water and terrestrial resources.

Current Management

The Los Angeles Regional Water Quality Control Board (LARWQCB) has jurisdiction over San Nicolas Island and Begg Rock. San Nicolas Island and Begg Rock are analyzed as part of the LARWQCB San Pedro Channel Islands Hydrologic Unit (LARWQCB 1994). According to the Basin Plan, the existing beneficial uses for the inland surface waters of SNI are wildlife habitat and rare, threatened, or endangered species. Potential beneficial uses for inland surface waters of SNI include: municipal and domestic water supply, water contact recreation, and warm freshwater habitat. Due to the isolation of SNI, limited access, and island operations, potential contaminants of the watershed are limited; therefore, the LARWQCB has not developed water quality objectives for inland surface waters island watercourses. The existing beneficial use for the groundwater of SNI is municipal and domestic supply. The potential beneficial use for the groundwater of SNI is industrial service supply. The LARWQCB has established the following groundwater quality objectives for SNI: Total Dissolved Solids - 1,100 milligram per liter (mg/L), Sulfate - 150 mg/L, Chloride - 350 mg/L (LARWQCB 1994).

The beneficial use designations for coastal features of SNI include navigation, water contact recreation, non-contact water recreation, commercial and sport fishing, marine habitat, rare-threatened or endangered species, shellfish harvesting, wildlife habitat, and preservation of biological habitats. For Begg Rock they are the same, except for navigation. The wildlife habitat beneficial use for both SNI and the Begg Rock is intended to support pinniped haul out areas. The potential beneficial uses for the coastal features of SNI and the Begg Rock nearshore zone are spawning, reproduction, and/or early development.

The waters surrounding SNI and Begg Rock to a distance of one nautical mile offshore or to the 300-foot isobath, whichever is greater, have been designated as an ASBS. The ASBS designation is intended to protect the species or biological communities, because of their value or fragility, from an undesirable alteration in natural water quality. Natural water quality conditions must be preserved and maintained to the extent practicable (Water Resources Control Board and California Regional Water Quality Control Board Administrative Procedures, 24 September 1970, Sec. XI and Miscellaneous Rev. 7-9/1/72). California Department of Fish and Game is responsible for management of marine resources in these areas. No site-specific regulations have been established for this ASBS, but the following general regulations apply:

- Discharge of elevated temperature wastes in a manner that would alter water quality conditions from those occurring naturally is prohibited.
- Discharge of discrete, point-source sewage or industrial process wastes in a manner that would alter water quality conditions from those occurring naturally is prohibited.
- Discharge of waste from nonpoint sources, including but not limited to storm water runoff, silt, and urban runoff, will be controlled to the extent practical. In control programs for waste from nonpoint sources, Regional Boards will give high priority to areas tributary to ASBSs.
- The California Ocean Plan, and hence the designation of ASBSs, is not applicable to vessel wastes, the control of dredging, or the disposal of dredging spoil.

The State Board adopted the Water Quality Control Plan for Ocean Waters of California (State Board Resolution No. 74-57) in 1974 and amended this plan in 1988 (State Board Resolution No. 88-111) and 1990 (State Board Resolution No. 90-27). This amended plan, which is referred to as the California Ocean Plan, establishes beneficial uses and water quality objectives for waters of the Pacific Ocean adjacent to the California coast outside of enclosed bays, estuaries, and coastal lagoons. The California Ocean

Plan also prescribes effluent quality requirements and management principles for waste discharges and specifies certain waste discharge prohibitions. Prohibitions include discharges of specific hazardous substances and sludge, bypasses of untreated wastes, and discharges. Waste discharges to ASBS are prohibited unless the State Board finds that there would be no adverse impact to beneficial uses.

Current Management—Storm Water and Non-Point Source Pollution Prevention

While pollution entering storm drains is usually from diffuse or nonpoint sources, the outfalls of storm drains represent a point source of discharge into SNI waters. The federal CWA, as amended in 1987 (§ 402[p]), and the Coastal Zone Act Reauthorization Amendments (CZARA) of 1990 (§ 6217) are the driving regulatory forces in addressing nonpoint source pollution from storm water runoff. Twenty-one outfalls at SNI may be inspected on annual basis to support compliance with these Acts.

■ **While pollution entering storm drains is usually from diffuse or nonpoint sources, the outfalls of storm drains represent a point source of discharge into SNI waters. The federal CWA, as amended in 1987 (§ 402[p]), and the CZARA of 1990 (§ 6217) are the driving regulatory forces in addressing nonpoint source pollution from storm water runoff.**

Storm water discharge to navigable waters is prohibited unless an NPDES permit is obtained. The EPA has delegated responsibility for the NPDES program to the SWRCB. In turn, the LARWQCB implements the program at the regional level. The CZARA requires EPA and the state to develop and implement management measures to control nonpoint pollution in coastal waters, which California has done through a procedural guidance manual produced by the California Coastal Commission (CCC 1997). The relation of the CWA and CZARA programs is described in more detail in other sources (LARWQCB 1994; CCC 1997).

The Navy has coverage under two storm water permits: the statewide General Industrial NPDES Storm Water Permit and the statewide General Construction NPDES Storm Water Permit, in order to support the beneficial uses of the ASBS designation. The Industrial permit requires wet and dry season monitoring and an annual report to regulators with storm water sampling results. As part of it, an SWPPP and a GIS record-keeping system is maintained. Enforcement of NPDES permits by the RWQCB is done when monitoring or another source indicates a violation of permit conditions. Cease and Desist Orders and Cleanup and Abatement Orders can be issued for noncompliance.

The most recent SWPPP was published in 2009 and has been implemented for SNI. The SWPPP identifies that 21 outfalls are monitored quarterly during dry season and during two storm events in the wet season. Samples are collected from three locations during two rain events. The SWPPP was written in accordance with requirements of the SWRCB Water Quality Order No. 97-03-DWQ and NPDES General Permit No. CAS000001. The NPDES General Permit authorizes SNI to discharge storm water from the date the Navy submitted an NOI, which occurred on 17 March 1992. The SWPPP is intended to eliminate illicit discharges, implement BMPs, conduct storm water monitoring, conduct industrial inspections, and train employees. SNI personnel currently implement specific BMPs at each Industrial Activity and general base-wide BMPs to reduce pollutants in storm water discharges from the site. The BMPs for SNI include: pollutant source controls, management practices other than source controls, preventative maintenance, spill prevention and response, erosion and sediment controls, identification of storm water pollution prevention personnel, and structural controls for runoff (Merkel and Associates Inc. 2007). San Nicolas Island trains personnel routinely on the goals and components of the SWPPP. This training includes proper implementation of BMPs, inventory control procedures, procurement of less toxic materials, proper use and storage procedures, recycling and reuse of materials, spill response and reporting procedures, and other requirements of the SWPPP.

Implementation of the 2009 SWPPP, SPCC and a soil erosion program greatly reduces potential for contamination and erosion influences on the water quality within the nearshore waters of SNI that are encompassed by the ASBS designation. The quality of surface and groundwater is also enhanced when soil erosion and contamination are reduced.

Current Management—Wastewater Treatment Plant

Effluent discharge (amount and concentration of potential contaminants) for the SNI Wastewater Treatment Plant is governed by a Waste Discharge Requirement issued by the LARWQCB. Permanent wastewater operators perform sampling activities and monitor the facility per permit requirements. The primary method of wastewater disposal is via evaporation from a series of three oxidation ponds. Irrigation is the secondary method of disposal. Treated wastewater is sprayed over a six-acre land area, which is restricted and off-limits to personnel. A plan to meet limitations for chlorides, total dissolved solids, and several other water quality parameters as set forth under the Waste Discharge Permit for SNI is in effect.

Current Management—Water Supply and Use

■ **For more information on Water Supply and Use refer to *Section 2.1.4.2: Utilities*.**

The seawater desalination system, which is discussed in greater detail in *Section 2.1.4.2: Utilities*, discharges under an exception and permit into the SNI ASBS, with limitations, including flow limits. The ASBS exception was adopted by the SWRCB (Resolution 90-105) in 1990, and the most recent permit (NPDES No. CA0061794) was re-issued by the LARWQCB in 2004. The Navy's existing brine discharge line and disposal well is currently malfunctioning due to sedimentation and infiltration issues. The Navy is in the process of assessing alternative discharge options, primarily focusing on the evaluation of an open ocean outfall.

Additionally, fresh water is delivered from off-island. A water barge can be moored near the RO desalination plant at Coast Guard Beach. The water is then off loaded through a submarine water line to a storage tank near Building 196. The second method is to deliver water tankers (trailers) on the freight barge that off loads at the pier. These two methods are expensive and used as a last resort (USDON 2005a).

Freshwater wells on the northwestern part of SNI are not a source of potable water but rather provide an as-needed source of water for construction activities. Groundwater is not required to be sampled because it is a source of water for non-potable use.

Assessment of Current Management at SNI

Assessment of Current Management—Storm Water and Non-Point Source Pollution Prevention

The historical assessment of the SNI storm water monitoring program, conducted by Merkel and Associates Inc. (2007), included comparing results from storm water sampling at SNI with EPA devised benchmarks that serve as "levels of concern" for storm water sampling. The EPA benchmarks are intended to provide comparison values for sampling that allow operators to gauge the effectiveness of their BMPs. Samples with pollutant concentrations above benchmark values signal the operator to evaluate on-site BMPs and storm water pollution measures already in place to prevent contaminant discharges to storm water. Benchmark values serve as indicators only, and benchmark concentrations are not effluent limitations, and should not be interpreted or adopted as such. These values are merely levels which EPA has used to determine if storm water discharge from any given facility merits further monitoring to ensure that the facility has been successful in implementing the most current SWPPP. EPA storm water benchmark exceedances have been observed occasionally and are reported in NBVC's annual storm water reports (SWRCB 2008).

Assessment of Current Management—Wastewater Treatment Plant

There have been no reported spills or upset events that resulted in the discharge of toxic or otherwise prohibited substances, including untreated or partially untreated wastewater in the SNI ASBS (Merkel and Associates Inc. 2007). The Navy is working on upgrading the wastewater treatment plant. Current wastewater monitoring is adequate and supports compliance with permit requirements. Additionally, a recent revision of the SWPPP was completed in July 2010 further strengthening existing BMPs and facilitating new adaptive management strategies (NBVC SNI 2010).

Assessment of Current Management—Water Supply and Use

The Navy has installed one new salt water storage tank and seven salt water wells for a total of ten on Coast Guard Beach to provide an adequate supply to the RO plant. The Navy is currently in discussions with the RWQCB and the SWRCB to obtain an updated NPDES permit for brine disposal through an open ocean outfall at the RO plant on Coast Guard Beach. The Navy is also modifying the drinking water distribution system and is assessing the current status of ground water resources.

Management Strategy

Objectives and Strategy for Water Resources and Water Quality

Objective: Comply with applicable water quality related regulations or directives to reduce and minimize water pollutants from entering the watershed and near-shore waters.

I. Protect the water quality of SNI waters.

A. Coordinate with the USACE, EPA, and LARWQCB as appropriate with regard to restrictions on, or required permits for any Navy actions that may affect water resources.

1. Continue to support BMPs for SNI that include pollutant source controls, management practices other than source controls, preventative maintenance, spill prevention and response, erosion and sediment controls, identification of storm water pollution prevention personnel, and structural controls for runoff.
2. Continue to update and implement the SNI 2009 SWPPP and integrate into general management strategies.
3. Continue to update and implement the SNI 2008 SPCC and integrate into general management strategies.
4. Continue to update and complete the ASBS exception package with respect to the RO plant intended to supply fresh water to the island.
5. Continue dry and wet season monitoring of storm drains.
6. Continue implementation of storm water BMP for pollution prevention.
7. Continue annual storm water reporting to the LARWQCB.

B. Habitat protection and water quality monitoring are the primary means SNI implements to provide for marine water quality health.

1. Relate the diversity and abundance of marine life to attributes of the substrate and water quality where they live, and manage substrate and water quality directly.

C. Implement watershed-based approaches wherever possible. The U.S. Navy has a policy on Watershed Management (OPNAVINST 5090.1C: 9-5.2): "*Installations should apply a watershed approach when evaluating the impact of their overall activities on the quality of area water resources and address water impacts by reducing pollutant discharges. A watershed approach is an integrated holistic management strategy that addresses the condition of land areas within the entire watershed. It ensures that non-point sources as well as point sources of pollution are addressed. Navy water program managers should consult other media experts (e.g. natural resources, RCRA/CERCLA, and air) to fully implement the watershed approach.*"

D. Implement BMPs to protect and improve water quality and to prevent erosion and sedimentation from SNI land and roads into sensitive waters.

1. Continue to implement BMPs for construction, training, maintenance, and other ground disturbing activities.
2. Assess and monitor BMPs to ensure they are achieving their stated goals.

E. Comply with water quality permit requirements when required by project site size or if a project may affect wetlands or watercourses.

II. Conserve water. Review military and non military uses at SNI for ways to contribute to water conservation.

A. Assess non-military uses at SNI for contributions to water conservation or impacts to water resources.

B. Ensure that military BMPs require that potable water not be used for landscaping.

C. Conserve groundwater at SNI.

1. Improve the integration of natural resources professionals into sustainability planning for groundwater resources.

a. Facilitate early, advance project review through RSIPs, NEPA, site approval, and sustainability action plans (SAPs) for storm water management, landscaping, shoreline and in-water structures.

b. Go beyond pollution prevention (P2) and compliance to sustainable operations.

c. Expand the incorporation of sustainability principles into project scope and cost estimates, such as that reflected in the DD Form 1391.

III. Sustain and expand long term monitoring efforts to evaluate baseline conditions of key water quality parameters at established and representative sampling locations throughout the ASBS, building on the work of Bight 1998, 2003, and 2008.

4.2.2 Soil Conservation

Specific Concerns

- There is evidence of large-scale (island-level) soil losses resulting from historical land use practices, most likely livestock grazing and military construction activity.
- The military mission and preparedness at SNI could be impacted by ongoing erosion, as infrastructure and facilities are potentially threatened.
- Erosion control measures may be eliminated from a project as a cost-cutting measure.
- The role of biological crusts in sustaining the health of island vegetation and soils has not been described sufficiently to be integrated into decision-making.

Current Management

The USSCS (now NRCS) conducted an inventory of soil resources at SNI in 1985 (see Map 3-3). Subsequently, Jayne Belnap of the USGS-Biological Resources Division conducted a study on biological crusts in 1989. These two studies represent the most current assessments conducted on SNI regarding soil resources.

Federal agencies must manage lands to control and prevent soil erosion and preserve natural resources by conducting surveys and implementing soil conservation measures. The SAIA, the Soil and Water Conservation Act, CWA, USDODINST 4715.3, and OPNAVINST 5090.1C require BMPs for soil and water resources on federal lands. The Clean Air Act (CAA) also restricts particulate matter emissions that result from soil disturbance.

Any project that may disturb the soil must go through a screening process with the Site Approval and Project Review Board, under NBVCINST 11010.1, in order to receive a site approval from local and regional Navy. This includes any soil disturbing activities such as digging, grading, stockpiling, dumping, staging, or establishing a laydown area. As necessary, BMPs are required of the project in order to protect the soil from erosion by wind and water. This project screening process is a streamlined means for project sponsors to comply with NEPA, as well as the laws, regulations and guidelines described above.

Assessment of Current Management at SNI

Implementation of NBVCINST 11010.1 has been necessary and sufficient to avoid and minimize impacts to soil resources that may result from activities related to the military mission at SNI. The site-specific erosion control provisions as well as guidelines for site revegetation requirements provide the means to control and manage site-specific erosion at SNI. However, military construction projects at SNI need to have better measures and BMPs included to control erosion as well as better oversight and review to ensure that adequate conservation measures are included in the project.

Soil conservation is needed to provide the ecological structure necessary for terrestrial habitats and communities to function and perform the ecosystem services that support the Navy's current use of SNI. An assessment of the health of soil resources at SNI will also contribute to further protecting and maintaining soil resources. The existing soil maps could be better integrated into land use and restoration planning. Soil maps also allow for the assessment of land/vegetation condition and trend, based on ecological site understanding that derives from such maps.

The causes of erosion at an island wide scale are related to historic land use practices rather than current military activities; however, a need continues to develop an island wide erosion management plan to correct ongoing problems, and to determine if restoration is a possibility.

Management Strategy

Objectives and Strategies for Soils Conservation

Objective: Conserve soil productivity, nutrient functioning, vegetation, wildlife habitat, and water quality by effectively implementing best management practices to prevent and control soil erosion.

- **Sedimentation is addressed as a concern in *Section 4.2.1: Water Resources and Water Quality*.**

I. The first priority is to prevent, through proper planning, losses of environmental values caused by impacts to soils, biological crusts, sedimentation, or airborne particulate matter.

A. Soil conservation shall be considered in all site feasibility studies and project planning, design and construction. Appropriate conservation work and associated funding shall be included in project proposals and construction contracts and specifications.

1. As per OPNAVINST 5090.1C, ensure incorporation of BMPs in the preliminary engineering, design, and construction of facilities involving ground disturbance.

a. Ensure enforcement of the site approval and Project Review Board requirements to prevent erosion and repair any damage that occurs during construction or maintenance activities.

b. Use the specific guidance for selecting BMPs as presented in the *California Storm Water Best Management Practices Handbook*, including project planning and design guides, SWPPPs, Water Pollution Control Programs preparation manuals, Construction Site BMPs Manual (Caltrans 2000), other specifications in use on island projects, and other proven techniques, with the following strategy:

1. Minimize site disturbance;

2. Stabilize site disturbance;

3. Protect slopes and channels;

4. Control site perimeter;

5. Control internal erosion; and

6. After construction, add source-control BMPs and treatment-control BMPs.

B. Minimize disturbance by locating staging areas in disturbed areas only. Staging areas should be prohibited within sensitive habitat areas. Staging areas should be delineated on the grading plans and reviewed by the resource agencies and project biological monitors prior to start of construction.

1. Continue to ensure that NEPA planners require that construction and road maintenance projects employ BMPs to minimize soil erosion by wind and water.
2. Evaluate the success of the BMPs that have been utilized at SNI.
    a. Assess and evaluate storm runoff and wind erosion and its effect on particularly vulnerable areas.
    b. Monitor BMPs in terms of:
        1. Implementation to expected specifications;
        2. Having the desired management effect; and
        3. Soundness in context of the overall management strategy.
3. Keep informed and up-to-date on improved methods for preventing environmental impacts during maintenance activities and on revisions in laws, regulations, guidance, and policies.
    a. Investigate the use of permeable ground cover types (e.g. gravel) to slow runoff and increase percolation.

C. Implement roadway improvement recommendations and investigate redirecting runway runoff to the ocean.

II. Control ongoing erosion.

A. Conduct an island-wide soil erosion and restoration assessment to determine what sites are actively eroding, which are not, and which have potential for restoration. Consider the following:
1. When erosion control work is deemed necessary because sites cannot revegetate on their own to their native condition, it should be prioritized according to its seriousness and potential impact to the natural resources based on the following criteria:
    a. Safety or security, as for emergency or military vehicle access on secondary roads;
    b. Potential for affecting high-value facilities or areas crucial to the military mission;
    c. Likelihood of affecting a federally listed species (beneficially or otherwise), a jurisdictional water of the U.S., or significant cultural resource;
    d. Volume of potential soil or habitat loss due to environmental conditions such as rain or wind; and
    e. Cost-effectiveness of the repair or control measure.
2. Revegetation efforts will utilize occasional seed collection and broadcast activities in conjunction with removal of invasive exotic plant species. Collect native seed to use in revegetation and restoration work as needed.

B. Assess and implement cost-effective means to reduce gully development or expansion.

III. Restore large-scale erosion as part of a long-term plan that addresses threats to natural and cultural resources island-wide, considers the risk of regulatory non-compliance under the ESA, CWA, and other laws, and examines cost-effective approaches.

IV. In tandem with other monitoring and mapping efforts, assess indicators of soil health.

A. Soil indicators include native plant cover, litter, rock, bare ground, presence or absence of compaction, and condition of biological crusts.

V. Stabilize disturbed sites with appropriate native erosion control plants or protective materials.

A. Ripping soils to decompact them has been found to be a cost-effective means of initiating self-recovery of sites.

B. As a first resort, prevent dust emissions. Prevention measures including confining the surface area to be disturbed, limiting vehicle traffic to 15 mph, and controlling the number and activity of vehicles on a site at any given time. Construction activities can also be scheduled to minimize exposed areas. Other prevention measures are:

1. Stabilize disturbed soils with appropriate erosion control methods.

2. Stabilize key access points prior to construction.

3. Direct most construction traffic to stabilized road surfaces.

4. Tackifiers should be used with caution, such as only on piles. They have been found to work best only where there is no traffic or other subsequent disturbance. To be effective, tackifiers require a compact soil surface, and sufficient moisture holding capacities (such as with the presence of clay, organic matter, or soil structure [clods]).

C. Plant disturbed sites that are erosion hazard or air quality nuisance with appropriate erosion control or native seed or plants. Adopt locally-proven revegetation practices with standards for:

1. Ground preparation and soil amendment such as:

a. Soil shaping to create water catchments by grading, pitting, or other means to create microcatchments or swales.

b. Soil amendments such as mulch with bark chops, local plant litter, straw, rock, and large woody chunks.

2. Planting techniques and types of plants (native species that easily establish) such as establishing vegetation islands, windbreaks, and protecting volunteer plants.

3. Seed mixtures of native species collected from the island.

4. Irrigation.

5. Timing of planting and irrigation.

6. Maintenance.

7. Success criteria or standards for compliance.

Objective: Conserve biological crusts and the ecological functions they provide.

VI. Map biological crusts.

VII. Support research on biological crust diversity and function in order to understand conservation needs.

VIII. Determine environmental conditions required to maintain functioning biological crust - list threats, strategies to restore, salvage, and promote.

4.2.3 Wildland Fire Management

Specific Concerns

- Federal wildland fire policy requires that all federal lands with burnable vegetation have a fire plan and resources to safely mitigate losses. This policy was adopted by the USDOD Wildland Fire Policy Working Group in 1996 and made the USDOD fire policy through USDODINST 6055.06 Fire and Emergency Services Program.
- There have been previous fires on SNI, but not very many.

- There are risks associated with military mission activities including the possibility of wildland fire ignitions. For example, the missile launch facilities on the west end of SNI may be regarded as a potential wildland fire ignition source because most of the fires that have occurred on SNI are associated with the launching of missiles. The disposal of munitions by EOD personnel and live fire training, although infrequent in occurrence, may also represent a potential wildland fire ignition source at SNI.
- Potential wildland fire ignitions may also result from normal human activity, such as maintenance and construction activities, which are indirectly associated with the military mission.
- Separate fire suppression strategies may be needed for different plant communities and different infrastructure support areas on the island, and these have not been identified.
- Security and logistical issues may prevent regular use of cooperating agency fire fighting resources due to the lack of regular fires.
- There may be a general lack of wildland fire suppression equipment and training.
- The potential exists for damage to archeological and environmental resources resulting from remote wildland fire suppression activities.
- Wildland fires have the potential to impact the habitats of lizard and bird species that warrant stewardship.

Current Management

There is no wildland fire management plan for SNI. There is an existing "let it burn" policy on SNI for wildland fires except if a fire may threaten people or structures. Fire suppression assets and resources are largely focused on structural fires that may occur within areas near the vicinity of the airfield or Nicktown. The Federal Fire Department (FFD) will mobilize and respond to an incident if a fire does occur.

The FFD at SNI oversees hazards and activities that may be considered as a potential fire ignition source; this includes activities such as weapons system testing, construction and maintenance, and recreational barbecues and bonfires. Fire suppression units are notified during weapons system testing and missile launches. The NEPA Site Approval and Project Review Board allows the FFD to review construction and maintenance projects that include potential ignition sources for fire; furthermore, the FFD may issue hot permits for welding activities and fire permits for the use of a recreational barbecue or bonfire pit. In general recreational fires are restricted to specific areas. The recreational fire pit behind the Islander club and recreational bonfires on SNI's beaches are a potential wildland fire ignition source and should follow guidelines for fire prevention and control, which includes notifying the FFD to request authorization for the use of a recreational bonfire.

Assessment of Current Management at SNI

■ **Refer to *Section 5.16: Outdoor Recreation* for more information regarding the use and management of recreational fires at SNI.**

Wildland fire is not a major concern at SNI but it does need to be considered due to federal wildland fire policy, habitat vulnerability, and the presence of the aforementioned potential fire ignition sources.

Federal wildland fire policy requires that all federal lands with burnable vegetation have a wildland fire management plan and resources to safely mitigate losses. This policy was adopted by the USDOD Wildland Fire Policy Working Group in 1996 and made the USDOD fire policy through USDODINST 6055.06 Fire and Emergency Services Program. Currently, SNI is not in compliance with this policy because a wildland fire management plan has not yet been developed.

Furthermore, historic grazing and surface disturbance from feral and domestic ungulates have created disturbed plant communities that favor exotic plants. Infestations of exotics, particularly exotic grasses is most pronounced on the upper plateau. The exotics are enhanced by the breaking and continued disturbance of organic and clay soil crusts. The crusts normally help the soil resist penetration by seeds of exotic weeds. The presence of these exotic plants increases the vulnerability of habitats to the occurrence of a wildland fire event. There is a need to develop an island wide wildland fire management plan given this vulnerability and the aforementioned federal compliance issues.

The one potential ignition source that needs to be regulated better is the use of recreational bonfires. Adequate measures are in place to communicate with the FFD for weapons system testing, construction, and maintenance activities; however, there is a lack of coordination for managing recreational bonfires at SNI.

A future wildland fire management plan for SNI should reflect the complexity of the problem and the perspective that rather than eliminating wildland fire, an unplanned wildland fire should be controlled so there is no harm to persons or sensitive habitat. In order to accomplish this, fire protection areas should be mapped out in wildland fire management zoning. A fire policy should be written taking into account which areas could continue to involve a "let it burn" policy, or develop a new policy that uses wildland fire as a management tool, and identify those areas that would be impacted by such policies.

Management Strategy

Objective and Strategies for Wildland Fire Management

Objective: Protect San Nicolas Island's human, infrastructure, natural, and cultural resources from harmful impacts of wildfire.

I. Provide, maintain, and/or upgrade fire management cooperative agreements, memoranda of understanding, and reciprocal agreements to provide maximum protection to natural and cultural resources and infrastructure values.

II. As a first priority, prevent wildland fire ignitions.

III. Develop a wildland fire management plan for SNI.

- *A.* Complete a landscape-scale risk/hazard assessment that identifies high values at risk, prescribes preemptive action to protect the values and sets priorities for implementation.
  - *1.* Develop post-fire rehabilitation guidelines appropriate to SNI and these plant communities.
  - *2.* Identify any fine fuels management areas.
- *B.* Emphasize staging of fire suppression and post-suppression rehabilitation resources so that inevitable wildfires may be responded to in a non-crisis atmosphere with proper planning.
  - *1.* For suppression, this includes equipment pools, water, retardant, suppression prescriptions by management area, and funding.
  - *2.* For rehabilitation, this includes equipment pools, site descriptions, treatment prescriptions based on research findings and historic successes, and funding.
- *C.* Provide fire suppression efforts commensurate with resource and adjacent property values at risk. Develop specific tactics and initial attack schemes based on buildings occupied by humans, highly valuable infrastructure, presence of sensitive species, historic districts, or unique vegetation communities.
- *D.* Prevent human-caused fires through an aggressive education, investigation, and public outreach effort.
- *E.* Train qualified on-island personnel to provide initial response to a wildfire.

IV. Determine fire frequency within habitats when considering future fire planning.

- *A.* Keep up to date GIS delineations of sensitive natural and cultural resources for use in future wildland fire planning.
- *B.* Consider on-site fire crews available during weapons system testing that has the potential to result in an unplanned wildland fire ignition.
- *C.* Provide training as appropriate for fire prevention and suppression.

D. Use naturally occurring land features, existing roads, and constructed fire-breaks when necessary to contain wildfires.

E. Continue to support and increase local fire fighting ability to respond to fires in remote or rugged areas.

1. Implement emergency fire suppression training for range operations personnel.

F. Use existing roads and natural features, such as washes, as part of a fire break system.

V. An MOU may be required to provide for assistance in fighting fires.

VI. Develop a database to track all fires, including acres burned, how suppressed and agency or personnel who suppressed the fire.

4.3 Management of Habitats and Plant Communities

4.3.1 Terrestrial Vegetation Communities

Specific Issues for Terrestrial Vegetation Communities

- Soil erosion, altered fire regime, invasive species, and climate change threaten the condition and biodiversity of terrestrial vegetation communities. This in turn may affect the abundance and diversity of wildlife.
- There appear to be vegetation changes on the island that are documented anecdotally or through historic photos that are not detected quantitatively or island-wide through the current monitoring program. It is not known if these changes might have a long-term trade-off effect on biodiversity or wildlife habitat.
- Current vegetation mapping is not consistent with the federal or state standards, which are quantitative, hierarchical systems that combine vegetation physiognomy and floristics. Many existing maps do not meet Federal Geographic Data Committee (FGDC) standards.

Current Management

Vegetation monitoring plots were placed in representative plant communities on SNI and on other Channel Islands under the jurisdiction of the NPS in a joint effort. Previously, no data had been collected regarding the density and demographics of shrub or sensitive species occurring on the plots. The addition of belt counts allow density data on perennial species and sensitive species to be collected.

- **For more information on the vegetation monitoring program at SNI refer to *Section 3.4.6: Long-Term Monitoring of Plant Communities*.**

The focus of current management has been a long-term, sustained investment in invasive plant control. Invasive plant control is prioritized by the potential of the plant species to spread, its proximity to sensitive species, and by current operations.

- **For more information on terrestrial vegetation communities refer to *Section 3.4.2: Vegetation Communities*.**

An RCD Weed Eradication Plan was developed with the support of the USSCS and has been implemented at SNI. The Weed Eradication Plan supplements an alien plant removal plan developed by natural resource staff in the early 1990s. Task orders have been developed to implement the current Weed Eradication Plan by eradicating highly invasive non-native plant species. Initial non-native plant control treatments on SNI were carried out by Agri Chemical and Supply Inc. starting in May 2001 (Agri Chemical and Supply Inc. 2009). This non-native plant control effort focused primarily on fennel (*Foeniculum vulgare*) and short-podded mustard (*Hirschfeldia incana*), although several other target non-native species were treated in 2008, including: arundo (*Arundo donax*), agave (*Agave* sp.), cliff aster (*Malacothrix saxatilis tenufolia*), smilo grass (*Piptatherum miliaceum*) and milk thistle (*Silybum marianum*) (Agri Chemical and Supply Inc. 2009). Best Management Practices have also been implemented to promote invasive plant control.

Assessment of Current Management at SNI

The Navy plans to revise the RCD Weed Eradication Plan for SNI and implement it by the fall of 2010 in a more strategic manner in order to pro actively support invasive plant control efforts. BMPs for invasive plant control are beginning to be implemented by explicitly adding them to contracts. Best Management Practices to promote invasive plant control also need to be enforced for ground disturbing activities and projects. Habitat vegetation restoration efforts could also be more effective if BMPs are enforced. A need exists for management of terrestrial vegetation communities to identify a methodology to ensure no net loss to habitat types and to offset any impacts from any proposed development project.

■ **See also *Section 4.1: Ecosystem Approach*, *Section 4.2.2: Soil Conservation*, *Section 4.2.3: Wildland Fire Management*, and *Section 4.6: Invasive Exotic Species*.**

Of the identified known threats to terrestrial vegetation (climate change, soil erosion, altered fire regime, and invasive species), the most urgent to address at SNI is thought to be invasive species. For this reason there has been long-term, sustained effort at invasive species control. In the absence of monitoring that may direct natural resources managers in addressing other threats, or the identification of focal species that could provide managers an indication of a need to change direction, this is a reasonable approach (Hierl *et al.* 2008). The current program has successfully decreased fennel through control measures over the last 20 years. This also true for an introduced buckwheat and smilo grass.

The current program has been successful at providing a baseline description of the floristic composition of vegetation on SNI and documenting the occurrence of rare and endemic plants through the Navy's partnership with the Santa Barbara Natural History Museum and CINP. This especially benefits comparison to other Channel Islands and to the mainland in these regards.

However, natural resources program objectives may be compromised by the broad, conceptual vegetation classification that currently exists for SNI scientifically by the lack of vegetation information, which are, along with soil substrate, the building blocks of habitat. This is because it is qualitatively rather than quantitatively derived, and too coarsely mapped, thereby missing much information needed to develop specific objectives for species and habitats that are the focus of management. It also makes it difficult for SNI to participate in regional planning with other agencies that are, increasingly, working with the U.S. National Vegetation Classification System (USNVC) which is the national standard. By developing quantitative vegetation descriptions, key habitat for numerous targeted rare plants and wildlife can be better defined.

Vegetation maps are often considered to be the best single surrogate for evaluating habitat and ecosystem health. The intent of all vegetation mapping and classification approaches is to systematically order vegetation or ecosystem patterns and to relate these patterns to ecological processes. Vegetation science has thus played an increasing role in wildlife and natural lands conservation and management over the years and is now among the principal tools involved in natural resources management and planning.

SNI managers will investigate various vegetation classification systems that are consistent with the approaches of the other Channel Islands and consider their benefits for habitat management at SNI. The classification systems that SNI may consider include but are not limited to the International Vegetation Classification (IVC) and the California Vegetation Classification and Mapping Program (VegCAMP). In North America, the IVC consists of the USNVC (Grossman *et al.* 1998) and the Canadian Vegetation Classification System. The VegCAMP system is California's expression of the USNVC. In 2007, the State Legislature required CDFG to develop a vegetation mapping standard for the state, now called VegCAMP which was developed in California initially as the Sawyer/Keeler-Wolf system, as described in the Manual of California Vegetation (Sawyer and Keeler-Wolf 1995), and updated in 2009. The USNVC and VegCAMP systems comply with requirements of the FGDC, and thus with USDOD requirements.

The existing field monitoring programs have allowed for documentation of some major vegetation shifts and the provision of some quantitative floristic cover data over time. However, similar to the vegetation mapping, the monitoring plots contribution to natural resources program objectives and management cues can be improved. The plot data have been insufficient to report on ecosystem health on a range-wide basis or for species that are the focus of management, because there are too few plots; they do not represent the range of surface substrates, landscape position, and geology on SNI; and the field measures collected are not able to detect changes that intuitively and anecdotally appear to be occurring in plant communities.

Finally, Halvorson (1996) noted from his field work in the early 1990s that the island is recovering from past use of natural resources including a grazing history that spans nearly a century and a military use history of over half a century, but that there are many areas of serious soil erosion and impacts from invasive plants. He observed that rehabilitation of the island to a more natural setting will require a complex active restoration scheme that includes soil restoration, enhancement of native species populations, and restoration of natural ecosystem processes. Nearly 20 years later, this is still the case. Restoration and assessing the island's vulnerability to emerging concerns, such as climate change, remain.

Management Strategy

Objective and Strategies for Terrestrial Vegetation Communities

Objective: Reduce threats to native vegetation habitat types while maintaining no net loss to the military mission.

I. Develop threat analysis for each vegetation community.

A. Address the priority threat of invasive species. Maintain the natural quality and integrity of native vegetation and habitats by reducing non-native plant species cover.

II. Continue to implement and revise the invasive non-native plant species management and eradication program, consistent with the long-term protection of native plant communities.

A. Follow the most current Integrated Pest Management Plan (IPMP), including prevention. This IPMP will be applied to invasive non-native species infestations.

- **See also *Section 4.6: Invasive Exotic Species*.**

III. Construction projects that clear vegetation or disturb soil will conduct post-construction weed control.

IV. Insert BMPs into contracts and other applicable plans that will reduce the threat to native vegetation habitat types and especially areas that are succeptible to erosion like coastal scrub.

- **An Integrated Pest Management Plan is a long term plan for managing pest problems, in contrast with the short term approach of relying on chemicals to abate pests, Integrated Pest Management relies on cultural, physical, mechanical and biological methods for controlling pests, with minimal dependence on chemical control.**

Objective: Restore, enhance, and offset losses of terrestrial vegetation communities.

- **See also *Section 4.1: Ecosystem Approach* and *Section 5.2: Construction and Facility Maintenance* for BMPs related to construction projects that affect vegetation.**

V. Develop a vegetation mapping plan.

A. Prioritize vegetation mapping projects by the sensitivity of the vegetation for special status species management, or to expected change in the vegetation due to military disturbance or other recognized threat like fire, invasives, or climate change.

B. Ensure each complete vegetation mapping project for SNI includes the following products:

1. Detailed vegetation report including a documented species list and community descriptions.
2. Digital vegetation map that incorporates soils and geomorphic attributes.
3. Vegetation plot data.
4. Accuracy assessment data and analysis.
5. Photo-interpretation key.

VI. Develop a comprehensive erosion control and restoration implementation plan which includes ranking system to identify which disturbed areas need to be stabilized from active wind and water erosion.

VII. Top priority is to avoid losses to the sensitive species habitat to ensure the stability of sensitive flora and fauna populations to preclude the need to designate critical habitat.

VIII. Establish criteria for restoration work as mitigation, such as risk of permanent loss of real estate or loss of potential to grow plants at all due to soil erosion. 50 CFR 402 Section 2 under ESA states "all federal departments and agencies shall seek to conserve endangered and threatened species and shall utilize their authority in furtherance of the purposes of the Act." Thus, restoration work that promotes the recovery of federally listed species can be interpreted as mitigation for habitat loss.

A. Use vegetation maps to plan recovery strategies for disturbed areas.

B. Make project proponent responsible for restoration.

C. Avoid and minimize losses and ensure habitat is protected to stabilize sensitive species populations.

Objective: Support monitoring of native vegetation habitat types.

IX. Priorities for monitoring may include areas such as restoration sites, areas of sensitive species, habitats of special concern, and threat prone areas.

X. Encourage research that can better define the extent, nature, and value of vegetation resources of SNI, and that helps sort out priority management actions to address risks and vulnerabilities related to these values.

4.3.1.1 Coastal Scrub

Specific Issues for Coastal Scrub

- Caliche Scrub is impacted by a tremendous loss of soil, most likely a result of past overgrazing by sheep. It is not known if the soil loss is ongoing or is now stable.
- It is not known if there is a reasonable or cost-effective opportunity to restore Caliche Scrub.
- Coreopsis Scrub and invasive grasslands are expanding on SNI, and it is not known if this may affect future biodiversity.

Current Management

The Coastal Scrub plant communities are currently described, managed, and monitored as a component of vegetation as a whole, rather than separately (see *Section 4.3.1: Terrestrial Vegetation Communities*). Impacts are generally avoided and minimized through the NEPA Site Approval and Project Review Process codified in NBVCINST 11010.1. Management of terrestrial habitats take into consideration and coordination with cultural resource management efforts focused on SNI's archaeological resources.

Assessment of Current Management at SNI

Coastal Scrub is the island's dominant land cover type and is comprised of five defined scrub habitats including Caliche, Isocoma, Baccharis, Lupine, and Coreopsis scrubs. The Coastal Scrub community is changing with respect to Coreopsis Scrub at least; for other subtypes it is less clear. There is uncertainty as to how to prioritize any effort targeted at these types because the cost-effectiveness is unclear, and there are no defined objectives or statement of desired outcomes.

Management Strategy

Objective and Strategies for Coastal Scrub

Objective: Protect coastal scrub habitat in its various forms to maintain or expand spatial extent in order to support natural species diversity, with special emphasis on cover types that support species warranting Navy stewardship.

I. Maintain the spatial extent and diversity of Coastal Scrub that now exists by controlling exotics and reducing erosion within defined habitats and minimizing anthropogenic impacts.

II. Define and map the boundaries of all coastal scrub cover types. Compare to historical photographs to evaluate trend and recruitment.

A. Identify the boundaries and condition of coreopsis scrub through the vegetation mapping program.

B. Identify the boundaries and condition of caliche scrub through the vegetation mapping program.

III. Continue to restrict access in sensitive areas, especially by vehicles.

A. Enforce general contract requirements for contractors in addition to SNI rules.

IV. Control ongoing erosion using BMPs.

V. Establish milestones and success targets for plant community composition and cover of non-natives in each Coastal Scrub community.

A. Increase the relative cover of native shrubs and herbaceous plants in relation to non-natives.

4.3.1.2 Vernal Pools

Specific Concerns for Vernal Pools

- There is uncertainty as to the natural or anthropogenic origin of vernal pools at SNI.

Refer to *Section 3.4.2: Vegetation Communities* for more information on the current status and trend of vernal pools at SNI.

Current Management

The vernal pool plant communities are currently described and monitored as a component of vegetation as a whole, rather than separately (see *Section 4.3.1: Terrestrial Vegetation Communities*). Impacts are generally avoided and minimized through the NEPA Site Approval and Project Review Process codified in NBVCINST 11010.1. Management of terrestrial habitats take into consideration and coordination with cultural resource management efforts focused on SNI's archaeological resources.

Assessment of Current Management at SNI

To date the vernal pools do exist; however the origin and historic condition of them is unknown. Currently there is a need to assess the integrity of the SNI vernal pool designation and manage them appropriately.

Management Strategy

Objective and Strategies for Vernal Pools

Objective: Protect vernal pools that support their natural species diversity, with special emphasis on species such as the fairy shrimp, which are dependent on this habitat.

I. Protect vernal pools and associated fauna to maintain their existing condition.

4.3.1.3 Riparian Vegetation

Specific Concerns

- There is a need to identify important isolated areas of riparian vegetation because of its importance to migratory birds.
- There is a need to identify the island wide distribution of riparian vegetation, such as areas dominated by willows, so as to avoid it when planning for future development.
- Willow habitat that includes riparian vegetation is important for migratory birds.
- Future use of fresh water wells would impact the groundwater supply that supports these systems.
- Invasive plant species pose a threat to riparian vegetation habitat.

Current Management

The riparian vegetation plant communities are currently described, managed, and monitored as a component of vegetation as a whole, rather than separately (see *Section 4.3.1: Terrestrial Vegetation Communities*). Impacts are generally avoided and minimized through the NEPA Site Approval and Project Review Process codified in NBVCINST 11010.1. Management of terrestrial habitats take into consideration and coordination with cultural resource management efforts focused on SNI's archaeological resources. Riparian vegetation habitat is also managed by the LARWQCB Basin Plan for surface water quality and ground water quality. Riparian vegetation habitat was mapped by USACE during their wetland delineation of SNI conducted in December 2008.

Assessment of Current Management at SNI

The current status and condition of this habitat is known based on the wetland delineation conducted by the USACE in 2008. Management for riparian vegetation can be proactive by reducing invasive species and improving habitat integrity. It is possible to expand this habitat by removing invasive trees and restoring willow, which also enhances this habitat for use by migratory birds. Benefits to other species, such as migratory birds, have been observed and assessed for this habitat.

Management Strategy

Objective and Strategies for Riparian Vegetation

Objective: Protect the riparian vegetation community in order to support natural species diversity, with special emphasis on supporting species warranting Navy stewardship.

I. Maintain the existing community boundaries, allowing no net loss from anthropogenic activity, by monitoring changes.

II. Remove non-native plant species in order to reduce competition and facilitate the expansion of associated riparian plants into adjacent suitable habitat.

4.3.1.4 Grasslands

Specific Issues for Grasslands

- Native perennial grasses do not make up a functional native grassland habitat. The perennial grass component of the grassland habitat appears to be missing.
- In the grasslands habitat dominated by non-native grasses there are small populations of other native and endemic grasses and other plants.
- Native perennial grasses currently exist in various habitats and notably in refugia under *Opuntia*.
- Vegetation and floristic data do not provide sufficient information to establish priorities for recovery, such as locations where a perennial grassland can be managed or enhanced to favor the perennials.

Current Management

The grassland plant communities are currently described, managed, and monitored as a component of vegetation as a whole, rather than separately (see *Section 4.3.1: Terrestrial Vegetation Communities*). Impacts are generally avoided and minimized through the NEPA Site Approval and Project Review Process codified in NBVCINST 11010.1. Management of terrestrial habitats take into consideration and coordination with cultural resource management efforts focused on SNI's archaeological resources.

- **For more information on fire control activities that occur in this habitat refer to *Section 4.2.3: Wildland Fire Management*.**

Mowing activities occur in this habitat for fire control, weed abatement, and road maintenance.

Assessment of Current Management at SNI

Maps and survey work have been done for native grasses at SNI. A potential exists to expand native grass populations and increase their visibility in terrestrial habitat management. A desired future condition is to have native grasses as a buffer around other managed habitats.

Management Strategy

Objective and Strategies for Grasslands

Objective: Develop restoration goals for grassland shrub savannah defining specific geographic and plant assemblages.

I. Investigate the processes such as wildland fire needed to sustain grasslands.

II. Reduce invasive non-native species so they are no longer a significant factor in community structure, function, or composition.

4.3.1.5 Coastal Marsh

Specific Concerns

- Marine mammals impact the vegetation of coastal marsh habitats.
- There is the potential for loss of connectivity for ocean water to support this habitat.

Current Management

The coastal marsh plant communities are currently described, managed, and monitored as a component of vegetation as a whole, rather than separately (see *Section 4.3.1: Terrestrial Vegetation Communities*). Impacts are generally avoided and minimized through the NEPA Site Approval and Project Review Process codified in NBVCINST 11010.1. Management of terrestrial habitats take into consideration and coordination with cultural resource management efforts focused on SNI's archaeological resources.

Coastal marsh habitat was mapped by the USACE during their wetland delineation of SNI conducted in December 2008. This habitat will be remapped periodically by the USACE when future wetlands delineations are conducted.

Assessment of Current Management at SNI

The coastal marsh habitat at SNI is its own self sustaining and functioning system. The most recent USACE wetland delineation is sufficient to identify the boundaries of this habitat.

Management Strategy

Objective and Strategies for Coastal Marsh

Objective: Maintain function and diversity of coastal marsh habitat.

I. Monitor key elements, including invasive species, for changes in trend that may affect the integrity of coastal marsh habitat.

A. If feasible restore, enhance, or maintain habitat based upon recommendations from monitoring.

4.3.1.6 Beach and Dune

Specific Issues

- Dunes are a dynamic component of the coastal landscape at SNI and their location and form may change over time.
- Dunes have the potential to obstruct roads on SNI.
- Dune movement affects the ability to use facilities and infrastructure to support the military mission at SNI.
- Dune management practices have used non-indigenous invasive species to stabilize drifting dunes.

Current Management

The beach and dune plant communities are currently described, managed, and monitored as a component of vegetation as a whole, rather than separately (see *Section 4.3.1: Terrestrial Vegetation Communities*). Impacts are generally avoided and minimized through the NEPA Site Approval and Project Review Process codified in NBVCINST 11010.1. Management of terrestrial habitats take into consideration and coordination with cultural resource management efforts focused on SNI's archaeological resources.

The ability of dunes to occlude major access arteries on SNI have prompted the use of European beach grass (*Ammophila arenaria*), which is a non-native invasive species, to stabilize drifting dunes and prevent them from crossing a road. If drifting dunes start to cross roads, Public Works staff will move the sand to the down-wind side of the road.

Assessment of Current Management at SNI

At the west end of the island there is a potential for the drifting dunes to cross roads. Dune drift can be investigated for possible management measures. There is a need to develop a dune drift management plan.

Management Strategy

Objective and Strategies for Beach and Dune

Objective: Protect the integrity of stabilized dunes with respect to cultural resources, root casts, and the natural abundance and diversity of native species.

I. Remove invasive non-native plants and replace them with native dune stabilizing plant species.

Objective: Research and develop management measures for drifting dunes.

II. Investigate dune drift processes on SNI.

III. Support the development of a Dune Drift Management Plan.

4.3.2 Jurisdictional Waters - Wetlands

Specific Issues

- Non-native invasive species, such as tamarisk, are present in freshwater riparian wetland habitat areas. Invasive plant species can outcompete native species and change the hydrology of wetlands.
- The coastal marsh wetlands on the back beaches are areas where marine mammals occur during the time period when they use haul out locations on SNI.
- Sedimentation from increased erosion can shrink wetlands or impact jurisdictional Special Aquatic Sites.

Jurisdictional wetlands are regulated under Section 404 of the CWA.

Current Management

The USACE delineated jurisdictional waters of the U.S. at SNI in December 2008 (USACE 2008). This delineation surveyed intermittent stream channels that discharge to the ocean, seeps, and lagoon areas. This 2008 jurisdictional waters of the U.S. delineation identified a total of 0.98 acres of wetland habitats on SNI, which includes riparian and coastal marsh habitat.

Fore more information on management and objectives for riparian and coastal marsh habitat management refer to *Section 4.3.1.3: Riparian Vegetation* and *Section 4.3.1.5: Coastal Marsh*. For more information on the current status of Jurisdictional Waters refer to *Section 3.4.5: Jurisdictional Waters*.

Under Federal requirements and Navy policy (OPNAVINST 5090.1C), there shall be "no net loss" of waters of the U.S. on SNI. Any action significantly affecting wetlands shall require an environmental review. Placement of fill or movement of earth of any kind is prohibited unless under permit. If it is demonstrated that wetlands impacts are unavoidable, then mitigation shall be required. Loss of wetland function shall be mitigated through wetlands enhancement, restoration, or creation. During normal, or above average, rainfall years, runoff collects in drainages or vernal pools on SNI.

Under Navy policy (OPNAVINST 5090.1C), there shall be "no net loss" of wetland habitat or waters of the U.S.

For intertidal habitat other than salt marsh, unvegetated shallows, and deep subtidal habitats in the USACE jurisdiction (below Mean Higher High Water), compliance with EPA Section 404(b)(1) Guidelines is essentially evaluated qualitatively and involves exercise of the judgment of the USACE in each permit application. The USACE is required to deny the permit if the findings show that the proposed discharge, even with mitigation, would result in "significant degradation," to include consideration of effect of the fill on the water bottom, water flow and circulation, turbidity, the aquatic ecosystem and organisms, contamination of the water, and downstream resources (40 CFR 230.10[c]). The Guidelines apply an additional burden of proof requirement covering special aquatic sites such as mudflats and eelgrass beds—to demonstrate that no practicable alternatives exist that will meet the project purpose (40 CFR 230.10[a]).

Within the restrictions of EPA Section 404(b)(1) Guidelines, the USACE will grant a permit unless the permit is determined to be contrary to public interest. To determine effect on public interest, the USACE is required to balance the benefits expected against the foreseeable detriments of the proposed project. The factors considered in this review are conservation, economics, aesthetics, environmental quality, historic values, fish and wildlife values, flood control, land use, navigation, recreation, water supply and quality, energy needs, safety, food production, and the general public and private need and welfare (33 CFR 320.4).

Under authority of the CCA and the federal CZMA, the CCC has jurisdiction over permits for development in the coastal zone within wetlands, tidelands, submerged lands (below mean low tide), beaches, estuaries, riparian habitat, streams and public trust lands. The definition of wetlands used by the CCC differs from that of the USACE in that it includes nonvegetated areas such as mudflats and an additional 100 feet (30 m) wide terrestrial buffer measured from the upland edge of the wetland.

The EO, "Protection of Wetlands," (EO 11990) requires federal agencies to provide leadership and take action to minimize the destruction, loss or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands when:

1. Acquiring, managing, and relinquishing of federal lands and facilities;
2. Providing federally undertaken, financed, or assisted construction and improvements; and
3. Conducting federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulating, and licensing activities.

Since the issuance of this EO, the focus of national policy has shifted from "minimizing" destruction, loss, and degradation of wetlands to "no net loss" of wetlands in carrying out the above federal activities.

Assessment of Current Management at SNI

The USACE conducted their wetland delineation for SNI in 2008. The status of those wetland habitats identified during that delineation, which included riparian and coastal marsh habitat, should be monitored. A future wetland delineation conducted by USACE may occur again. Jurisdictional delineations should be performed at each installation to show which wetlands or water bodies are subject to regulatory jurisdiction under Section 404 of the CWA or Section 9 and 10 of the Rivers and Harbors Act of 1899.

The focus of implementation of EO 11990 on SNI should be on the enhancement of non-jurisdictional wetlands and the springs; on freshwater, not salt water wetlands. The coastal wetlands on the back beaches would require excluding marine mammals, which would be a poor use of natural resource management funds.

Management Strategy

Objective and Strategy for Wetlands

Objective: Protect the natural and beneficial functions of San Nicolas Island waters and wetland vegetation, as part of appropriate permits with the USACE and to ensure no net loss of area, function, or value. Preserve and enhance wetlands as directed under Executive Order 11990.

- **Commanders shall ensure that boundaries of legally defined wetlands, on all Navy lands, are identified and mapped with sufficient accuracy to protect them from potential unplanned impacts, and that the maps are distributed to all potential users, including facilities planners, operational units, and tenant commands (OPNAVINST 5090.1C).**

I. A current inventory of wetlands shall be maintained and net changes monitored annually (OPNAVINST 5090.1C; USDODINST 4715.DD-R 1996).

A. Monitor wetland community plant species composition and relative cover on an annual basis to determine if wetland margins are expanding and to ensure no net loss in structure or function.

B. Keep/update GIS database of all wetlands.

II. Protect the natural ecological integrity, structure, and functional values of the wetlands and floodplains on SNI. The Navy will comply with EO 11990 and the national goal of no net loss of wetlands.

A. Continue to comply with water regulations to ensure wetlands are not at risk of pollution.

B. To reduce impacts to natural resources and maintain the desired level of training, soil erosion control activities should be prioritized according to the seriousness of the degradation and its potential impacts using the following parameters:

1. Potential impact on high-value facilities, including frequently-used roads that, if impassable, could hamper training access.

2. Damage to Navy lands.

3. Likelihood of sediment entering a Jurisdictional Wetland or Waters of the U.S., impacting a listed species, or affecting significant cultural resources.

4. Volume of potential soil loss.
5. Cost-effectiveness of the control measure.

C. Remove non-native invasive species, such as tamarisk, from freshwater wetland habitats and those upstream areas that help confer the ecological integrity to those wetland habitats.

D. Prohibit dumping, filling or other contamination of waters of the U.S. Filling requires a permit from USACE.

4.3.3 Coastal and Marine Habitats and Communities

The coastal and marine habitats and communities surrounding SNI support a diverse and robust community encompassing every trophic level and taxonomic family. The relative isolation of SNI from the California mainland has provided these habitats and communities a certain degree of protection from impacts related to development, extraction, and pollution. Additionally, prohibition of public access by the Navy has reduced extraction of marine resources especially in the intertidal zone. While these communities represent some of the most pristine coastal and marine areas contained within the SCB they have sustained changes and remain vulnerable to both natural and anthropogenic factors.

Specific Issues

- Pollution, commercial and recreational fishing, and invasive species threaten the condition and biodiversity of coastal and marine communities. This in turn may affect the distribution, abundance and diversity of wildlife.
- Changes to coastal and marine habitats and communities have been documented quantitatively through fisheries dependent data, annual surveys, and historic photos that have led to increased regulation as well as federal and state listing of several species.
- There is uncertainty whether the documented changes are recoverable over the long-term and if not what the implications are to biodiversity or community health.
- Observed changes to the environment from climate change, erosion, and intra-species competition continue to contribute to shifts in habitat and community distribution and structure that require consideration when developing management strategies.

Current Management

The current management of coastal habitats and associated plant communities is based on mapping and descriptions conducted from February to June 1992 by Halvorson *et al.* (1996) in which twelve vegetation communities (see Map 3-4; Table 3-1) were classified based on 103 relevé plots. Distinct coastal habitats were included in the described communities and included coastal marsh and beach dunes. In 1993, 36 permanent vegetation sampling plots were established on SNI by CINP. The monitoring system was originally designed as part of a joint program for all of the Channel Islands (Halvorson *et al.* 1996). During 2009 surveys were repeated with some additions to the methods to improve detection of island-wide trends (TDI 2009).

The monitoring of these distinct vegetation communities enables the Navy to make proper management decisions pertaining to the status of island coastal plant communities and habitat. This comes from the recognition that SNI coastal vegetation is in various stages of recovery from grazing, farming, military use, and introduction of invasive plant species.

The focus of current management on coastal vegetation has been a long-term approach utilizing sustained monitoring and invasive plant control. The natural resources program has prioritized coastal areas for weed control as the most at risk for impacts and because of the possibility and practicality of control.

Beach habitat and communities below the vegetation line are mostly managed through controlled access and limitation of activities stipulated in SNI's NEPA Site Approval and Project Review process codified in NBVCINST 11010.1, the current BO with USFWS, and the Letter of Agreement (LOA) with NOAA pertaining to marine mammals. Beach characteristics and use are managed through regularly performed surveys for western snowy plovers and marine mammals.

Management of resources below the mean high water mark (4.14 feet [1.26 m] for SNI 2010), considered *State Tidelands and Submerged Lands* is the responsibility of the CDFG as confirmed by the federal Submerged Lands Act of 1953 (43 USC 1301 *et seq.*) which granted ownership of lands and resources within this body of water to coastal states such as California *(shoreline to 3 nm [5.6 km] offshore)*. The Navy supports the authority and responsibility of the CDFG to manage marine resources by providing access and information regarding use of the islands marine resources.

Ecosystem management of marine and coastal communities and habitats is further accomplished through the partnerships between USFWS, NOAA, CDFG and through cooperative research agreements with Universities that provide data to support adaptive management strategies.

Assessment of Current Management at SNI

Current management of SNI's coastal and marine resources contributes to maintaining habitats, communities, and populations through planning processes, access restrictions, invasive species control, and monitoring. The listing of the black abalone as a federally endangered species and the commitments embodied in the MOU between the Navy and BLM regarding the CCNM require that the Navy continue its efforts to conserve aquatic resources through proper stewardship.

Management Strategy

Objective: Conserve coastal and marine resources by protecting habitat, monitoring sensitive resources, and fulfilling stewardship commitments to other federal and state partners.

Objective and Strategies for Coastal and Marine Habitats

I. Protect and manage populations of the federally endangered black abalone in rocky intertidal habitat in order to preclude designation of critical habitat.

II. Protect and manage populations of the federally threatened western snowy plover on sandy beaches in order to maintain compliance with current BOs.

III. Support the management and implementation of the Begg Rock State Marine Reserve, as proposed in the California MLPA process.

IV. Support the management of the offshore rocks near SNI and Begg Rock that are designated as part of the CCNM in order to support partnerships with the BLM and their implementation of the Monument's Resource Management Plan.

4.3.3.1 Sandy Beaches

Specific Issues

- Sandy beaches are exposed to risks posed by debris, pollution, and invasive species.
- No existing qualitative or quantitative information is available on the biologically productive components of sandy beaches that subsequently support many species of shore birds including the federally threatened western snowy plover.
- Observed changes to the environment from increased populations of pinnipeds have created intra-species competition that may be contributing to shifts in habitat and community distribution and structure that require consideration when developing management strategies.

Current Management

Sandy beaches are managed directly through utilization of the Site Approval and Project Review process codified in NBVCINST 11010.1.

Sandy beaches are managed indirectly by limiting human uses during substantial times of the year due to the occurrence of marine mammals and western snowy plovers. Reducing access to beaches promotes natural interaction between species and reduces potential impacts from disturbance and anthropogenic materials.

Assessment of Current Management at SNI

Utilization of the Site Approval and Project Review process in conjunction with access limitations to sandy beaches are necessary but not sufficient to protect and maintain communities that occur in this habitat. In addition to use restrictions for this habitat, sustained efforts to remove invasive exotic species and continued monitoring efforts will contribute to this habitat's conservation.

Management Strategy

Objective: Maintain and protect the attributes of sandy beaches to sustain a diverse and abundant invertebrate and wildlife community through the implementation of best management practices and documenting existing species assemblages.

Objective and Strategies for Sandy Beaches

I. Establish baseline information and conditions of sandy beach communities.

- *A.* Support scientifically recognized methodologies and surveys to evaluate individual beaches with special emphasis on indicator species, endemics, invasives, and protected species.
- *B.* Complete GIS delineations of sandy beach habitat throughout the island to identify and conserve valuable habitat and reduce operational conflicts.
- *C.* Establish acceptable use periods based on the time of year to enhance military training flexibility while maintaining habitat integrity and BMPs.

4.3.3.2 Rocky Intertidal Community

Specific Issues

- The rocky intertidal communities are exposed to risks posed by debris, pollution, and invasive species.
- Climate change and related increases in sea surface temperature create shifts in the dominant species assemblages that may contribute to changes in habitat and community structure that require consideration when developing management strategies.
- The rocky intertidal is identified by the state of California to contain several key indicator species used to assess ecosystem health and to identify locations for the designation of marine protected areas.

Current Management

Management of rocky intertidal areas is primarily accomplished through the restriction of access to the southern shoreline and limited access to the northern shoreline for resident personnel due to the presence of marine mammals during specific portions of the year.

Few published marine biological surveys for the rocky intertidal have been conducted at SNI; however, the various rocky intertidal surveys that have been conducted at SNI provide important baseline information. Caplan and Bootlootian (1967) conducted intertidal surveys at two locations, both located on the southern portion of the island between Dutch Harbor and Daytona Beach. Intertidal biodiversity surveys were again conducted on SNI in 2003 and 2007 by the PISCO Coastal Biodiversity Studies program at two locations on SNI; one located on the northern portion of the Island, and the other on the southern portion (Merkel and Associates Inc. 2007). The PISCO also established a new Coastal Biodiversity Studies program site at Tranquility Beach in 2009.

■ **For more information on the monitoring and management of black abalone at SNI refer to *Section 4.5.1.3: Black Abalone - Federally Endangered*.**

Dr. VanBlaricom (1993) has also studied the distribution of black abalone at SNI since the 1970s (Merkel and Associates Inc. 2007). VanBlaricom continues to conduct an annual monitoring effort to document trends in black abalone populations at SNI and this 30 year data set of nine monitored sites represents the single longest dataset on abalone abundance in California.

Additionally, the USFWS in cooperation with UC Santa Cruz established five permanent intertidal sites around SNI in 1980. The five sites have been sampled twice a year in spring and fall since that time with a few exceptions. The project is currently conducted by the USGS-Biological Resources Division, UC Santa Cruz Field Station. While these data have not been published, efforts are presently underway to compile and analyze them.

In 2007 the SWRCB requested that the Navy conduct quantitative intertidal and subtidal biological surveys as part of SNI's ASBS exception process to document existing conditions and dominant assemblages at four locations around the island: Tranquility Beach, Blue Whale Cove, Corral Beach, and Dutch Harbor. A new site was established and surveyed in December 2009. Data from these surveys are being analyzed as part of a regional process established by SWRCB and are expected to be available in the summer of 2010.

Assessment of Current Management at SNI

While existing research on black abalone provides the single largest long-term data set for that species, data on the broader rocky intertidal ecosystem have not been compiled from continuing surveys. A review of existing intertidal studies, compilation and analysis of existing data, and establishment of a series of monitoring sites using a methodology consistent with those employed throughout the California is necessary.

Management Strategy

Objective and Strategies for Rocky Intertidal

Objective: Update monitoring of rocky intertidal indicator species to better document baseline conditions in order to implement best management practices and preserve a functional habitat that supports a diverse invertebrate and wildlife community.

I. Encourage intertidal monitoring at SNI, that is similar to that performed at the other Channel Islands and throughout California, to establish regional trends and understand site specific change.

- *A.* Support the compilation and analysis of existing intertidal monitoring data from USGS and other sources.
- *B.* Support establishment of scientifically recognized protocols for monitoring locations around SNI in intertidal habitats that represent key indicator species.
- *C.* Support annual monitoring of black abalone populations by continuing to conduct density surveys.
- *D.* Support GIS mapping of black abalone densities to establish sensitive areas and document trends in recruitment and depletion.

Objective: Provide access to academic researchers to investigate important community related questions involving recruitment, disturbance, and species diversity that help to assess regional trends.

II. Continue to support rocky intertidal monitoring and GIS delineations of rocky intertidal habitat in order to provide site specific information on rocky intertidal species diversity and biogeographic distribution patterns.

A. Encourage and support independent scientific research and develop cooperative research agreements focused on recruitment of important indicator species or species of concern.

B. Monitor an appropriate set of environmental variables (i.e. water and air temp, nearshore current speed and direction) in order to better understand what is driving the patterns of distribution and abundance.

4.3.3.3 Nearshore Waters - Unvegetated Soft Bottom

The nearshore waters of SNI are composed of various habitats that represent subtidal areas and associated habitats from the shoreline to the deep offshore waters. Habitats include unvegetated soft bottom, vegetated soft bottom, and rocky reefs and kelp forests. Many of these habitats can be further subdivided to examine fine scale differences; however, for the purpose of natural resource management and regulatory considerations these categories are most applicable.

Specific Issues

- Very limited qualitative or quantitative information is available on the extent, quality, and diversity of unvegetated soft bottom communities adjacent to SNI that subsequently support many species of commercially important invertebrates and fish.
- No specific issues are currently identified that may effect the health, abundance, or stability of these communities

Current Management

Naval Base Ventura County supports surveys and studies performed by various state and federal agencies examining the unvegetated soft bottom habitat and performs regular ASBS monitoring of three areas that contain these communities. All potential activities that could potentially interface with unvegetated soft bottom habitat is reviewed under the NEPA site approval and project review board.

Assessment of Current Management at SNI

Continued monitoring of unvegetated soft bottom habitat in support of ASBS compliance increases the availability of baseline data that allows assessments of the status and trend of wildlife populations that occur within this habitat. Continued support of surveys and studies conducted by various state, federal, and non-governmental partners will also contribute to the development of adequate baseline data.

Management Strategy

Objective and Strategies for Unvegetated Soft Bottom

Objective: Inventory and protect the attributes of unvegetated shallows that sustain a diverse and abundant invertebrate community, fish and wildlife foraging, nursery function for certain species such as the California halibut, as well as an ecological role in detritus-based food web support.

I. Encourage and support unvegetated soft bottom monitoring that is performed at SNI and throughout the SCB.

A. Support species abundance/diversity surveys to establish general community dominants and baseline conditions.

B. Implement best management practices to preserve diverse and functional habitat.

C. Map the extent of unvegetated soft bottom habitat to evaluate the proportion of the habitat in relation to rocky reef habitat and vegetated soft bottom habitat.

D. Support multi-beam and Lidar mapping and GIS delineations of subtidal habitat adjacent to SNI to identify habitat types and reduce the potential for operational impacts.

4.3.3.4 Nearshore Waters - Vegetated Soft Bottom

Specific Issues

- Vegetated soft bottom habitat, such as an area that is dominated by eelgrass, has a very limited distribution in the waters surrounding SNI; no recent comprehensive surveys have been performed to examine the extent, quality, and diversity of this sensitive habitat.
- Vegetative soft bottom communities (eelgrass) are considered special aquatic sites under the CWA; this designation requires that this community should be mapped and avoided during island activities and military training.
- Deposition from erosion may affect the health, abundance, or stability of these communities.

Current Management

Naval Base Ventura County supports surveys and studies performed by various state and federal agencies examining the vegetated soft bottom habitat and performs regular ASBS monitoring of one area adjacent to known eelgrass habitat. All potential activities that could potentially interface with vegetated soft bottom habitat is reviewed under the NEPA Site Approval and Project Review process. Eelgrass beds are recognized as "Special Aquatic Sites" under the CWA and as such receive special attention from the USACE and the EPA when determining mitigation measures. Eelgrass is also considered EFH under the Magnuson-Stevens Fishery Conservation and Management Act.

Assessment of Current Management at SNI

Continued utilization of the Site Approval and Project Review process is necessary but not sufficient to maintain and protect eelgrass habitat at SNI. Continued monitoring and analysis of the status and trends of eelgrass habitat that is based on baseline data sets are needed in addition to Site Approval and Project Review NEPA planning activities.

Management Strategy

Objectives and Strategies for Vegetated Soft Bottom

Objective: Maintain habitat integrity of vegetated soft bottom (eelgrass) habitat that supports fish and wildlife foraging and performs as a nursery function for numerous fishes and invertebrates.

I. Encourage the preservation of vegetated soft bottom (eelgrass) habitat through supporting baseline surveys conducted within SNI waters.

A. Allow no net loss of shallow subtidal habitat in area or in existing net biological values.

B. Comply with regulations to avoid this EFH area and establish buffer zones for protection.

C. Support delineations of subtidal habitat to document existing eelgrass beds and habitat to reduce conflicts arising from operational or facility projects.

D. Delineate vegetated soft bottom habitat and avoid this habitat if projects occur within adjacent areas through utilization of the Site Approval and Project Review process.

4.3.3.5 Nearshore Waters - Rocky Reefs and Kelp Forests

Specific Issues

- The rocky reefs and kelp forest communities are exposed to risks posed by pollution, overfishing, and invasive species.
- Limited qualitative or quantitative information is available on the extent, quality, and diversity of rocky reefs and kelp forest habitat that subsequently supports a multitude of fish, invertebrates, bird, and marine mammal species including the federally endangered White abalone.
- Climate change facilitating increased sea surface temperatures create shifts in the dominant species assemblages that may contribute to changes in habitat and community structure that require consideration when developing management strategies.
- The rocky reefs and kelp forest communities are identified by the State of California to contain several key indicator species used to assess ecosystem health and identify locations for the implementation of marine protected areas.
- Current surveys documenting baseline conditions are not comparable with methodologies utilized throughout the remainder of the Channel Islands.

Current Management

Various rocky reef and kelp forest surveys have been conducted at SNI over the decades by various public and private research entities providing some important baseline information. Ongoing cooperative research with the USGS has developed the most valuable long term site specific data examining giant kelp and sea urchin interaction. Management of rocky reef and kelp forest communities is primarily accomplished by regulations enforced by the CDFG to limit commercial and recreational fishing. All potential activities that could potentially interface with rocky reef and kelp forest habitat are reviewed under the NEPA Site Approval and Project Review process.

Assessment of Current Management at SNI

Continued utilization of the NEPA Site Approval and Project Review process is necessary but not sufficient to maintain and protect rocky reef and kelp forest habitat at SNI. Monitoring using an acceptable methodology and analysis of the status and trends of rocky reef and kelp forest habitat that is based on baseline data sets are needed in addition to Site Approval and Project Review NEPA planning activities.

There is a need to utilize a scientifically acceptable methodology to characterize the long term status and trend for communities and populations that occur within SNI's rocky reef and kelp forest habitat. The methods utilized during USGS studies are not directly comparable with the other methodologies utilized throughout the remainder of the Channel Islands. While individual surveys exist, a long term monitoring program for rocky reefs and kelp forests at SNI that is comparable with other Channel Island and coastal California datasets does not exist; this limits the ability for the Navy to be able to identify status or trends for wildlife populations in rocky reef and kelp forest habitat at individual sites. Currently SNI is a State ASBS providing a degree of protection to various fish and wildlife species through water quality protection. Intertidal resources receive additional protection through the use of closures and restricted access on SNI.

Management Strategy

Objectives and Strategies for Rocky Reefs and Kelp Forests

Objective: Enhance the protection and documentation of subtidal kelp forest attributes to establish baseline conditions and evaluate population trends of invertebrate and fish indicator species.

I. Support establishment of kelp forest ecosystem monitoring locations around SNI.

A. Survey habitats that contain the key indicator invertebrate and fish species associated with kelp forests.

B. Conserve locations that best represent the fixed array of organisms and physical settings associated with various habitats and exposures at SNI.

C. Limit impacts to kelp forests through the NEPA Site Approval and Project Review Board.

D. Utilize scientifically recognized kelp forest ecosystem monitoring protocols to assess long term trends in community structure and seasonal variations to ensure ASBS compliance.

E. Establish sites as compliance for ASBS monitoring and develop a defensible data set for future NEPA consultations and non point source effects to support the military mission.

II. Encourage state and federal agencies and academic researchers to investigate important community related questions involving recruitment, disturbance, and species diversity that help to assess regional trends.

A. Support surveys of the federally endangered white abalone to establish the presence/absence of the species within SNI waters.

B. Support kelp mapping surveys to examine trends in surface coverage and primary production.

4.3.3.6 Offshore Rocks

Specific Issues

- Offshore rocks are important as roosting (and sometimes nesting, though not at SNI) habitat for many seabird species.
- Offshore rocks represent an environment that is not well studied and only rudimentary information exists on the extent, quality, and diversity of these communities adjacent to SNI.
- There is uncertainty as to the extent that offshore rocks of SNI support populations of avian species that warrant stewardship or protection.
- No specific issues are currently identified that may effect the health, abundance, or stability of these communities.

Current Management

In January 2000 a proclamation establishing CCNM placed “all unappropriated or unreserved lands and interests in land owned or controlled by the U.S. in the form of islands, rocks, exposed reefs, and pinnacles above mean high tide within 12 nm (22.2 km) of the shoreline of the State of California,” under the management of the BLM. The proclamation specifically identifies the pelagic, nearshore, and terrestrial bird species associated with the CCNM, as well as the importance of this nearshore ocean zone for pinnipeds, general biodiversity, and other species and resources of scientific interest (BLM 2005). In the geographic extent of the monument, there are 12,767 offshore rocks or islands recognized. Of these, 11,507 fall under the jurisdiction of the BLM and therefore, the CCNM. Only 70 of these rocks are larger than one acre and of these only 11 are greater than five acres in size.

By Presidential Proclamation on 11 January 2000, all unappropriated or unreserved lands and interest in lands owned or controlled by the U.S. in the form of islands, rocks, and pinnacles above mean high tide within 12 nm (22.2 km) of the shoreline of the state of California were designated as the California Coastal National Monument. This designation includes the portions of the CCNM off of the shoreline of SNI and Begg Rock that are administered by NBVC.

The Secretary of the Interior manages the CCNM through the BLM and under the BLM's existing authorities, subject to the overriding purpose of protecting the resources described in the Presidential Proclamation. The BLM's authority for such activities are directed by the Federal Land Policy and Management Act of 1976, Section 307(b), which provides that the Secretary of the Interior may undertake programs of resource management through cooperative agreements. The BLM is directed by Congress to administer the public lands so that all various land and resource uses and values are managed in combinations that will best meet the needs of the American people.

Through an MOU signed in the summer of 2000, the CDFG and the California Department of Parks and Recreation (CDPR) were brought in as managing partners to assist the BLM, who retains the ultimate legal responsibility for the CCNM, in "preserving the [CCNM's] objects of historic and scientific interest,...mapping and understanding resources within the Monument, [and]...working with the public to explain the values of the Monument." In order to effectively deal with the wide array of partnership opportunities associated with the CCNM, three basic partnership categories have been developed:

- Core-Managing Partner: Each of the three 'core' agencies - BLM, CDFG, and CDPR - responsible for collaborating in the overall management of the entire CCNM.
- Collaborative Partner: An organization, governmental or private, that is interested in collaborating with the core managing partners in any of a variety of programs, actions, and management elements associated with the long-term management of the CCNM.
- Steward: A select entity with ownership and/or management responsibility for a portion of the coast that adjoins part of the CCNM and that is interested in serving as the local CCNM BLM point of contact for the adjacent portion of the CCNM.

Each Steward will work with the BLM and other CCNM partners as appropriate, in a cooperative and collaborative management effort to ensure the long-term protection of their specific portion of the CCNM, a portion that is offshore of the Steward's onshore property.

The Resource Management Plan that guides the management of the CCNM was approved by a ROD in September 2005. Further management guidance was developed in November 2007 when the U.S. Navy and the BLM entered into a MOU (BLM MOU No. CA-939-08-02) to establish an interim agreement whereby the Navy will serve as a Steward for those portions of the CCNM off the shoreline of SNI and Begg Rock that are administered by NBVC. The authority for the Navy to enter into such an MOU is derived from EO 13352 of 26 August 2004, Facilitation of Cooperative Conservation, which requires the Secretaries of Defense and Interior to carry out activities of their respective agencies that relate to the environment and the natural resources in a manner that facilitates cooperative conservation.

Of relevance to this INRMP, the MOU between the U.S. Navy and the BLM regarding the CCNM identifies that the Navy agrees to cooperate with the BLM on defining the monitoring and research needs for the CCNM and developing a strategy for implementing the protection, monitoring, and research needs consistent with the Navy's integrated natural resource management plans.

Assessment of Current Management at SNI

Implementation of the CCNM Resource Management Plan and the MOU between the Navy and the BLM has not yet been fully realized. The Navy's agreement to act as a Steward for the marine and coastal resources of the offshore rocks surrounding SNI and Begg rock requires habitat protection, natural resource inventories, monitoring, and research commitments. Partnerships between the BLM and the Navy and other federal, state and non-governmental partners will facilitate implementation of those commitments. As no specific threats have been identified for these habitats, priority management actions will likely continue to focus solely on habitat protection.

Management Strategy

Objectives and Strategies for Offshore Rocks

Objective: Maintain the integrity of the offshore rocks adjacent to San Nicolas Island to insure a viable community with natural abundance and composition of invertebrates, fish, and wildlife.

I. Develop a plan for offshore rock habitat conservation.

A. Conserve fragile communities by limiting access and reducing human impacts from debris and or structures.

B. Limit disturbance and establish guidelines for buffer zones, closure periods, and access limitations.

4.4 Fish and Wildlife Management

4.4.1 Terrestrial Invertebrates

Specific Issues for Terrestrial Invertebrates

- There should be a sufficient inventory and monitoring program developed for terrestrial invertebrates.
- At least two introduced non-native snail species, the European garden snail and predatory decollate snail are present on SNI and may pose a threat to the small remnant population of terrestrial land snails on SNI.
- Argentine ants are an exotic invasive species that are a known threat to endemic populations on SNI.
- The California WAP (Bunn *et al.* 2007) has identified the San Nicolas island snail as a state endemic special status invertebrate.
- A vulnerability for terrestrial invertebrates is that over a dozen taxa of insects found on SNI are considered endemic specifically to SNI or to the Channel Islands.
- Native pollinators may have co-evolved with island endemic flora and be important to habitat and rare plant management.
- Invertebrates play ecologically crucial roles in the terrestrial ecosystem and are important food items for many birds, small mammals, and lizards.
- Insects are essential for decomposition and soil formation processes.

Current Management

The last broad terrestrial invertebrate survey that addressed SNI was one conducted in the 1970s for Point Mugu by Nagano; this project thoroughly studied the terrestrial invertebrates of Point Mugu and addressed SNI as a side project. Since the 1970s several researchers have looked at specific terrestrial invertebrate families or genera, including some snail studies, but no recent study has conducted a general terrestrial invertebrate inventory on an islandwide scale.

Terrestrial invertebrates are formally managed from a habitat perspective through the utilization of the Site Approval and Project Review Process codified in NBVCINST 11010.1. Terrestrial invertebrates are also managed through informal interactions between the environmental staff and pest contractors that work on SNI. The environmental staff also looks out for new invertebrate arrivals during their daily routine while conducting fieldwork throughout the year.

Assessment of Current Management at SNI

A need currently exists to supplement current management activities with educational opportunities to provide pest management contractors with awareness of the threat of exotic invasive terrestrial invertebrates. A formalized educational program may enhance the capacity of the environmental staff to utilize the time that pest management contractors spend in the field in order to detect introductions of invasive exotic invertebrates into habitats on SNI. For more information regarding management of terrestrial exotic invasive species refer to *Section 4.6.1: Terrestrial Invasive Exotic Species*.

Management Strategy

Objectives and Strategies for Terrestrial Invertebrates

Objective: Conserve intact native invertebrate communities and develop measures to prevent the establishment and spread of invasive invertebrates.

I. Determine baseline information on the invertebrate community of SNI, with particular emphasis on endemics.

A. Consolidate existing information on documented species.

B. Add support studies that would inventory insects and also focus on interactions between invertebrates and endemic fauna and flora.

1. Support completing baseline field surveys for endemic terrestrial invertebrates that focus on understanding endemic invertebrate food resources such as endemic plants and surveys that focus on understanding which endemic invertebrates are utilized by endemic fauna.

2. Support studies on all federally and state listed endemic plants to determine which invertebrates contribute to their pollination and are essential to their reproduction.

3. Support completing baseline field surveys that assess interactions between invasive exotic terrestrial invertebrates and endemic flora and fauna.

II. Develop educational materials that are provided to researchers, personnel, and contractors about the threats posed by exotic invasive terrestrial invertebrates.

III. Develop biosecurity measures to make sure exotic invasive terrestrial invertebrates are not brought to SNI, and those that are detected early are responded to rapidly.

A. Enhance early detection and rapid response capacity by setting traps near the barge and airfield to monitor for new arrivals and screen soil and plants brought to SNI.

4.4.2 Reptiles and Amphibians

Specific Issues for Terrestrial Reptiles and Amphibians

- There are no amphibians documented on SNI.
- The distribution of alligator lizards and side blotched lizards are expanding.
- There is a concern of the effect of a competitive interaction between alligator lizards and island night lizards upon the population stability of island night lizards.
- Lizards are prey items for other species including foxes.

Current Management

Management of the island night lizard on SNI, like most contemporary natural resources management programs on the island, is ESA compliance-driven by Section 10 or Section 7 requirements, rather than within an ecosystem approach.

To comply with ESA Section 10 requirements, a report is provided when long term island night lizard surveys are performed on SNI. These long-term surveys assess the abundance of the population over time through surveying the presence of lizards at specific sites to assess survivability of known individuals, surveying transects that are designed to check on the expansion of the population, and surveying pitfall traps within a monitoring grid.

In response to an ESA Section 7 consultation, a programmatic BO was issued for Activities on San Nicolas Island (1-8-01-F-14) on 15 October 2001. This BO addresses missile and target launches, barge operations, proposed pier construction, reverse osmosis plant operation, equipment/materials storage and staging areas, debris removal, roadside maintenance, recreation, natural resource research and management, amphibious training exercises, explosive ordnance disposal, proposed multi-purpose instrumentation sites, and routine small construction projects and utilities maintenance. This BO includes an Incidental Take Statement for the island night lizard as well as discretionary reasonable and prudent measures and non-discretionary terms and conditions that identify conservation measures to support the recovery of SNI's population. For example, some of the conservation measures identified in the BO require that island night lizards be relocated when doing construction, moving debris, or conducting vegetation management activities. A completed five year review of the island night lizard in California (72 FR 7064) did not recommend a change for the status of the SNI island night lizard population.

Assessment of Current Management at SNI

Ongoing long term monitoring of the island night lizard provides the SNI environmental staff an adequate mechanism for tracking reptile populations and identifying potential invasive introductions. The 2006 USFWS status review for the island night lizard listed feral cats as a major concern for the species. While recent fox studies reported that island night lizards do not provide much of a food source to terrestrial island predators predation pressure remains a potential threat to this resource. Conserving habitat integrity for island night lizards through management of habitat and prevention of habitat loss through implementation of the Site Approval and Project Review Process and conservation measures identified in the BO provide the greatest contribution to sustaining populations of endemic lizards.

Management Strategy

Objectives and Strategies for Reptiles and Amphibians

Objective: Continue programs and collaborative efforts to minimize impacts and protect the federally listed and species warranting Navy stewardship to the maximum extent practicable.

I. Support regular monitoring of reptiles and amphibians in addition to island night lizard monitoring.

II. Conserve the habitat integrity for this species by targeting habitat for protection where there is a higher population density of island night lizards and allowing future development to occur in those areas with lowest population densities.

III. Continue to use of the Site Approval and Project Review Process (NBVCINST 11010.0) to avoid sensitive areas and minimize potential impacts.

4.4.3 Birds

Specific Concerns

- Of the over 300 species identified to utilize SNI, 58 have some special status assigned by government or non-government agencies (ESA, CESA, MBTA, U.S. Shorebird Conservation Plan, and U.S. Seabird Conservation Plan; see Table 3-6 under *Section 3.8: Special Status Species*).

- Bird species of the Channel Islands tend to have smaller populations and smaller breeding ranges, rendering these species to be more vulnerable to ecological stresses (Rich *et al.* 2004).
- There is uncertainty of the spatial extent of the effects of the Navy's management decisions on global populations of island breeding birds, specifically seabirds.
- Expansion of marine mammal populations within coastal habitats threatens the breeding success of several avian species of concern.
- Gulls redistribution of nesting areas are affecting other species, such as the special status western snowy plover.
- There is uncertainty of the impact of competition between non-native bird species and endemic resident bird species.
- Naval weapons testing activities, such as missile launches, occur near a shorebird and seabird colony on the west end of SNI where nesting and breeding activities occur.
- There is uncertainty how the impacts from wildland fire, such as burned habitats that include ground nesting bird breeding areas, affect the reproductive success of those ground nesting bird species; several potential ignition sources for wildland fire exist on SNI (see *Section 4.2.3: Wildland Fire Management*).
- There is uncertainty of the effect of road maintenance and mowing impacts to ground nesting birds.
- Challenges exist for developing enforceable BMPs for road maintenance and mowing activities to minimize impacts to bird populations during breeding season while also minimizing the potential for weed dispersal.
- Future development on SNI includes the operation of wind turbines for electrical energy production to supplement energy needs to support the military mission; antennas, guy wires, and wind turbines are hazards to migratory birds.
- A BASH plan had not been developed at SNI.
- The MBTA's Migratory Bird Rule and other USDOD guidance and policies are in the early stages of implementation at SNI; military mission requirements that may affect migratory birds are to be specifically identified and monitoring set up to document whether adverse effects from military use could be significant at the population level.
- San Nicolas Island lacks a standardized method to maintain the current status and long term trend of migratory and resident bird populations.

Current Management

Migratory Bird Treaty Act

The MBTA of 1918 (16 USC 703-711) is legislation that covers species protected under four international treaties. These treaties are agreements between the U.S., Canada, Mexico, Japan, and Russia and protect most species of birds. The MBTA prohibits the taking or pursuing of migratory birds, their eggs, feathers, or nests. Game birds are listed and protected except where specific seasons, bag limits, and other factors govern their hunting. Exceptions are also made for some nuisance pests, which have standing federal depredation orders (e.g. yellow-headed, red-winged, tri-colored, Rusty and Brewer's blackbirds, cowbirds, all grackles, crows, magpies, rock doves, European starlings, and house sparrows).

The MBTA provides the USFWS the opportunity to comment on projects potentially affecting bird species, and their habitats, that are not protected under the ESA. Violations of the MBTA can result in fines of up to $2,000 or two years imprisonment. Therefore, if a project has the potential to affect nesting birds or nesting substrate (including the trimming of nest trees) a qualified biologist from NAVFAC SW should be contacted to determine if there will be any violations of the MBTA. U.S. Department of Defense policy states that migratory bird programs shall be established in support of and consistent with the military mission.

MOU Between the USFWS and USDOD

In 2001, President Clinton issued EO 13186, requiring that federal agencies whose actions may affect migratory birds to develop and begin implementing, within two years, an MOU with the USFWS aimed at conserving these birds. It also established a federal interagency Council for the Conservation of Migratory Birds to help agencies implement the Order. In addition, the EO required NEPA evaluations to include effects on migratory birds and that advance notice or annual reports must be made to the USFWS concerning actions which result in the taking of migratory birds. The EO also required agencies to control the establishment of exotic species that may endanger migratory birds and their habitat.

The USFWS/USDOD MOU (FR 30 August 2006) that evolved out of the requirements of the EO addresses the conservation of migratory birds on military lands in relation to all activities except readiness. The MOU is a guidance document on how the USDOD will conserve migratory birds and does not authorize any take. In April 2007, further guidance was issued by the Under Secretary of Defense for Acquisition, Technology and Logistics on implementing the MOU to Promote the Conservation of Migratory Birds between the USFWS and USDOD in accordance with EO 13186. This guidance covers all activities at SNI, including natural resources management, routine maintenance and construction, industrial activities, and hazardous waste cleanups. The guidance emphasizes interdisciplinary collaboration within the framework of the U.S. North American Bird Conservation Initiative (NABCI) Bird Conservation Regions, collaborative inventory and long-term monitoring.

Migratory Bird Rule

In an effort to provide guidance for conflicts arising between military readiness activities and the MBTA, the USFWS issued the final rule on, "Migratory Bird Permits: Take of Migratory Birds by the Armed Forces" (50 CFR Part 21 in FR 28 February 2007, pages 8931-8950), hereinafter referred to as the Migratory Bird Rule. The Migratory Bird Rule authorizes the military to "take" migratory birds during military readiness exercises under the MBTA without a permit, but if the military determines that the activity will have a significant adverse effect on a population of migratory birds, they must work with the USFWS to implement conservation measures to minimize and/or mitigate the effects.

The authorization for take requires an understanding of the definition of the following highlighted terms:

- *Population* is a group of distinct, coexisting (conspecific) individuals of a single species, whose breeding site fidelity, migration routes, and wintering areas are temporally and spatially stable, sufficiently distinct geographically (at some time of the year), and adequately described so that the population can be effectively monitored to discern changes in its status.
- *Significant adverse effect on a population* means an effect that could, within a reasonable period of time, diminish the capacity of a population of migratory bird species to sustain itself at a biologically viable level. A population is “biologically viable” when its ability to maintain its genetic diversity, to reproduce, and to function effectively in its native ecosystem, are not significantly harmed. This effect may be characterized by increased risk to the population from actions that cause direct mortality or a reduction in fecundity. Assessment of impacts should take into account yearly variations, and migratory movements of the impacted species. Due to the significant variability in potential military readiness activities and the species that may be impacted, estimates of significant measurable decline will be determined on a case-by-case basis.

Conservation measures under the Migratory Bird Rule require monitoring and record-keeping for five years from the date the Armed Forces commence their conservation action. During INRMP reviews, the Armed Forces must report to the USFWS migratory bird conservation measures implemented and the effectiveness of the conservation measures in avoiding, minimizing, or mitigating take of migratory birds.

Many questions remain about how to implement the Migratory Bird Rule. Uncertainty remains regarding how the evaluation of significance is to be addressed. Since the impact assessment must be conducted on populations of migratory birds, there will mostly be a need to collect more refined population baseline data.

Monitoring and Surveys

Annual monitoring and regularly scheduled surveys including project or readiness surveys are performed on SNI in compliance with the Migratory Bird Rule for all avian groups and potentially affected bird species.

Biannual western snowy plover surveys are completed during the spring and fall covering the entire island including facilities and recreational areas where plovers may nest. The biannual surveys are inn compliance with the existing BO and coordinated with USFWS regional surveys to assess population dynamics and trend. Additionally, western snowy plovers that are located within the sphere of influence of a missile launch are monitored before and after those launches in accordance with the conservation measures identified in the most current BO.

Aerial surveys focused on evaluating roosting seabirds, primarily cormorants and pelican, are accomplished annually or bi-annually (e.g. in the winter and during the breeding season) through partnerships with the California OSPR and USGS. Surveys of breeding western gulls are performed when the RO plant brine pond is assessed per permit requirements. The Montrose Settlements Restoration Program has also funded Harry Carter to analyze seabird data he collected during the 1990s and present his findings in a report in order to supplement the existing seabird data for SNI.

Breeding bird surveys with permanently established point count stations were completed in 2000 (Wehtje 2000), and a bird checklist of species confirmed on SNI was documented in that report (Appendix E). In the future SNI staff biologists intend to partner with the USFWS in order to support surveys that will utilize these point count stations.

No general shorebird surveys are conducted SNI; rather shorebird surveys are focused on western snowy plovers and oystercatchers. Shorebird surveys for the oystercatchers are also often done at the same time as western snowy plover surveys. An in-depth study of oystercatchers, a state listed species, was completed in 2008 documenting their current status and breeding locations. Surveys performed when the RO plant brine pond is assessed per permit requirements also provide another source of data for a migratory shorebirds; groups of sanderlings are sometimes present at that location. Surveys conducted in rocky intertidal habitat for various purposes have also identified that shorebirds, such as Turnstones, are sometimes present in this habitat.

Resident land bird surveys, such as for American kestrels and burrowing owls, are surveyed intermittently by SNI staff biologists. Recent landbirds surveys performed in 2009, in conjunction with the NEPA review of a Wind Turbine project, continue to update the existing species list and status of individual species that use SNI habitats. The NEPA review of the Wind Turbine project also conducted research on the effects of infrastructure, antennas, guy wires, and wind turbines on migratory birds.

Assessment of Current Management at SNI

Current management of avian fauna provides baseline inventory and habitat information sufficient to assess current conditions and track potential effects to most of the identified sensitive species. Interaction between NBVC and SNI biologists and federal and state regulatory agencies have developed effective communication for monitoring strategies related to western snowy plover and cormorants.

The absence of a comprehensive database capable of maintaining the current status of all avian fauna, by compiling previous surveys with results obtained from project or readiness related surveys, limits the installations ability to evaluate potential effects and comply with conservation requirements set forth in the Migratory Bird Rule. A Checklist of the Birds on SNI developed by the Santa Barbara Museum of Natural History in 2000 may be used as a source of baseline data to develop such a comprehensive database. New data may be added to this database as subsequent surveys are performed in the future. In order to facilitate compliance with the Migratory Bird Rule new survey data may also be added to appendices of this INRMP as part of the INRMP metrics annual update process. The intent of this INRMP is to provide an assessment of historic baseline data in the document while also providing an opportunity to update survey data.

A need exists for general land bird, shore bird, and sea bird monitoring to be done regularly and with a consistent scientifically acceptable methodology in order to document the status and trend of the Island's avian populations. SNI will continue to investigate and assess military use impacts on resident and migratory bird populations, such as nesting seabirds and shorebirds, in order to document any significant adverse effects to those populations and maintain compliance with the Migratory Bird Rule. The monitoring of a seabird colony during missile launches from a nearby area have indicated that seabirds do not abandon the site of their colony after launches. Evidence suggests that cormorants tend to stay on the ground whereas gulls take to flight as a group and then settle back down. Uncertainty as to the effects of missile launches upon this colony require that the effects of these military uses continue to be monitored.

An emerging management concern is the increase in marine mammal pinnipeds that have displaced habitat for shorebirds and seabirds. Focused studies are needed to document the loss of beach habitat to shorebirds and seabirds as a result of the increased use of those areas by marine mammals. This information will help identify any potential negative interactions that marine mammals may have upon special status avian species.

Another emerging management concern is the need to reconcile road maintenance and mowing activities to take into account ground nesting bird breeding seasons while also minimizing the potential to disperse weed seeds. Conservation measures, such as those presented as management strategies for this section, are being developed to address this concern.

The NEPA assessment of the Wind Turbine project also led to the development of new conservation measures to protect migratory birds. For example, a recommendation has been made to outfit guy wires and infrastructure with visual deterrence devices (e.g. flappers) to protect migratory birds.

Lastly, the future development of a BASH plan specific to SNI may further contribute to conservation of bird populations at SNI.

Management Strategy

Monitor populations and maintain, restore, and enhance habitats that provide for the health of migratory and resident populations of birds depending on NBVC SNI habitats to complete their life cycles, emphasizing Birds of Conservation Concern and other special status species.

Objectives and Strategies for Migratory and Resident Birds

Objective: Comply with the Migratory Bird Treaty Act, 2003 Defense Reauthorization Act Migratory Bird Rule, Executive Order 13186, and other federal laws, regulations, and Memoranda of Understanding regarding the protection of migratory birds.

Objective: Identify and conserve viable habitat for migratory birds that use SNI for breeding, nesting, resting, or feeding.

I. Inventory and monitor habitat and populations of migratory birds that use SNI to evaluate conservation effectiveness through Navy efforts at SNI and by cooperating with other large-scale efforts.

A. Identify migratory bird species of concern for SNI that will be the focus of monitoring (see Table 3-6).

1. To identify bird species of concern, SNI adopts the species that may use its land and waters listed in periodic reports of Birds of Conservation Concern published by the USFWS Division of Migratory Bird Management[1]; priority migratory bird species documented in the comprehensive bird conservation plans (U.S. Shorebird Conservation Plan, Colonial Seabird Conservation Plan, North American Waterbird Conservation Plan); species or populations of waterfowl identified as high, or moderately

1. Available online at: http:// migratorybirds.fws.gov/reports/bcc2008.pdf.

high, continental priority in the North American Waterfowl Management Plan[1]; focus species identified in the California PIF plans; listed threatened and endangered bird species in 50 CFR 17.11; and MBTA-listed game birds below desired population sizes.[2]

B. Maximize the effectiveness of ongoing monitoring and management efforts by continuing to implement standardized, scientifically sound survey protocols to collect and analyze population abundance and distribution of birds across water, upland, and transitional habitat types and seasonally. Ensure that survey protocols will establish current local population sizes and also permit credible estimates of population trends at five-year intervals. By standardizing monitoring techniques, researchers ensure that results can be compared across space and time.

1. Consolidate existing migratory bird monitoring information.

2. Maximize the cost effectiveness and value of existing specialized monitoring programs for listed species by collecting standardized data on multiple species (such as point counts) in addition to any specialized protocols aimed at one species.

a. Support efforts to monitor the established point count stations as a long-term standardized population monitoring program by partnering with the USFWS.

3. Inventory birds using methods that can be integrated with the work of regional partners.

a. Investigate the compatibility of the USDA Forest Service (USFS) published guidelines for standardized monitoring techniques for monitoring birds (Ralph *et al.* 1993) for use at SNI.

b. Determine how current established monitoring programs might contribute to regional databases and monitoring protocols, including the Breeding Bird Survey, Breeding Bird Atlas, Colonial Waterbird Surveys, International Shorebird Survey, Hawk Migration Surveys, Breeding Bird Census, Winter Bird Population Studies, survey information collected locally by federal and state agencies, and the USGS Bird Banding Laboratory. As appropriate, coordinate with Avian Knowledge Network and USDOD e-bird databases to ensure bird monitoring data are submitted.

C. The transitory nature of many migratory birds complicates assessment of the health of habitats and populations. In support of California PIF bird management plans, consider conducting intensive, long-term monitoring at selected sites for more than five years, including both reference sites and at key experimental sites.

1. In the Migratory Bird Rule under the Defense Reauthorization Act (DRA), the USFWS would "encourage the USDOD to develop information that will assist in guiding its decisions regarding migratory bird conservation, particularly in developing or amending INRMPs. This Rule would not require the USDOD to obtain new data to assess impacts of a proposed or an ongoing action on birds in order to comply with the provisions of this rule. Existing demographic, population, habitat association, species indicator, or ecological indicator data may be used to estimate the level of take and evaluate whether a proposed or an ongoing action is likely to have a significant adverse impact on a population."

D. Collect and assess information on environmental contaminants and other physical or biological stressors having potential relevance to migratory bird conservation. Where such information is collected in the course of agency actions or supported through federal financial assistance, reasonable efforts shall be made to share such information with the USFWS, USGS-Biological Resources Division, and other appropriate repositories of such data.

1. Available online at: http://www.waterbirdconservation.org.

2. Available online at: http://migratory-birds.fws.gov/reports/reports.html.

E. To comply with the DRA, SNI should use the best scientific data available to assess through the NEPA process, or other environmental requirements, the expected impact of proposed or ongoing military readiness activities on migratory bird species likely to occur in action areas.

F. Regularly monitor infrastructure that may pose a hazard to migratory birds, such as wind turbines, in order to document any significant adverse impact to migratory bird populations.

G. SNI should address impacts on species of concern more thoroughly and specifically, focusing on the effects of the proposed action on the sustainability of these populations. Special consideration should be given to priority habitats, such as important nesting areas, migration stop-over areas, and wintering habitats.

H. Continue to update breeding bird surveys for migratory avian species.

1. Link this effort with that of other needed surveys to cost-effectively evaluate ecological conditions and trends.

I. Include the results of monitoring in the annual review of this INRMP.

J. Promote research and information exchange, including coordinated inventory and monitoring (EO 13186).

1. Increase communication and coordination between land managers and specialists hired to implement specific projects or conduct monitoring. Coordinate with monitoring and research projects targeted at non-avian taxa to maximize the benefits of the protection, management and restoration of riparian habitats.

2. Use cooperative assistance from wildlife agencies, organizations, and volunteers to help collect needed data. Integrate with regional databases.

II. Conserve, restore, and enhance migratory bird habitat, as practicable. Improvements to existing habitat include wetland protection, maintenance and enhancement of buffers, elimination of feral animals (in particular, feral cats) that may be a threat to migratory birds, and elimination of invasive species that crowd out other species necessary to migratory bird survival (2003 DRA Proposed Rule).

A. Avoid detrimental habitat alteration caused by establishment of invasive plants.

B. Avoid encroachment into the springs, seeps, and washes by preventing off-road activity and trespass into these areas.

C. Complete the feral cat removal program initiated in the spring of 2009 and perform post removal monitoring.

D. Ensure that use, protection, and enhancement of naturally occurring and man-made water sources do not adversely affect use by avian species.

E. Support biological research of species, interactions with mammalian predators, and impacts from increasing marine mammal presence.

F. Remove unused communication towers, antennas and other structures, which could pose a hazard to migratory birds.

G. When operationally practicable, follow the USFWS guidelines for the siting, construction and operation of communications towers.

H. Maintain and enhance primary roosting, foraging, and nesting sites.

1. Identify opportunities for maintaining and enhancing primary habitats.

2. Develop a migratory bird protection protocol for routine maintenance activities such as mowing and tree trimming.

I. Identify opportunities through mitigation and non-mitigation funding to protect existing, restore degraded, and recover priority bird habitats.

J. Support cleanup efforts to reduce contaminants and toxic buildup in the ecosystem, including monitoring and reducing nonpoint sources.

K. Investigate use by birds of unused antennae and guy wires, and means to eliminate these as a hazard to migratory birds.

III. Implement bird conservation principles, measures, and practices through avoidance and minimization measures to protect migratory bird populations.

A. The principal means of evaluating the effect of actions on migratory birds will be through the NEPA process or other established environmental review processes, with emphasis on species of concern (EO 13186).

B. NBVC will prepare NEPA analyses whenever it proposes to undertake a new military readiness activity that may significantly affect the quality of the human environment; make a substantial change to an ongoing military readiness activity that is relevant to environmental concerns; learn of significant new circumstances or information relevant to the environmental concerns bearing on an on-going military readiness activity; or prepare or revise an INRMP covering an area used for military readiness activities.

C. Obvious avoidance measures will be considered at the outset of project planning, such as siting projects to avoid important nesting areas or to avoid collisions of birds with structures, or timing projects to avoid peak breeding activity.

D. Minimize the intentional take of species of concern.

1. EO 13186 and MBTA require that SNI provide notice to the USFWS in advance of conducting an action that is intended to take migratory birds and is not directly related to authorized military readiness activities, or annually report to the Service on the number of individuals of each species of migratory birds intentionally taken during the conduct of any agency action, including but not limited to banding or marking, scientific collecting, taxidermy, and depredation control.

2. Develop standards, protocols, and procedures for such take.

3. Humanely control non-native animal species when necessary.

4. Review and evaluate actions that take migratory birds for means to avoid and minimize such take, with emphasis on activities that may affect the sustainability of migratory bird species of concern.

E. Identify areas of unintentional take of species of concern and minimize such take. Executive Order 13186 states that agencies will identify where unintentional take reasonably attributable to agency actions is having, or is likely to have, a measurable negative effect on migratory bird populations, focusing first on species of concern, priority habitats, and key risk factors. With respect to those actions, the agency (NBVC) shall develop and use principles, standards, and practices that will lessen the amount of unintentional take, developing any such conservation efforts in cooperation with the USFWS. These principles, standards, and practices shall be regularly evaluated and revised to ensure that they are effective in lessening the detrimental effect of agency actions on migratory bird populations.

1. Restrict access into and disturbance of nesting and breeding grounds during critical periods. Incorporate this restriction as a mitigation for proposed projects.

2. Prevent or abate effects on migratory bird populations caused by pollution.

3. Reduce pesticide use (see also *Section 5.14: Landscaping and Grounds Maintenance*). Continue to limit the use of rodenticides. Remove any dead or dying rodents from a treated area to reduce the possibility of secondary poisoning through raptor predation of poisoned rodents.

F. Provide training and information to employees regarding protection of migratory birds in compliance with laws to avoid and minimize take and conserve and restore habitat (EO 13186).

1. Limit disturbance during the breeding season. Promote understory and groundcover quality by postponing mowing until after peak breeding season. If mowing must be done during breeding season, maintain a low herbaceous layer of no more than six inches (15 cm) to discourage birds from nesting there in the first place. Limit restoration activities and disturbance events such as grazing, disking, and herbicide application to the nonbreeding season. When such actions are absolutely necessary during the breeding season, time disturbance to minimize its impacts on nesting birds.

G. Set guidelines to protect migratory birds such as requirements for towers and guy wires to reduce bird mortalities.

■ **For more information regarding BASH management refer to *Section 4.7.1: BASH Program*.**

IV. Reduce bird/animal aircraft strike hazards.

A. Collect bird/animal aircraft incident data and maintain records of BASH incidents, including time of day, date, species involved, and location.

B. Continue efforts to develop and implement a BASH plan.

C. Ensure that SNI natural resources manager attends classes on bird hazards to aircraft operation.

D. Mow airfield and adjacent areas to discourage use by avian species.

E. Remove potential bird perches from the airfield vicinity.

F. Support censuses of the airfield area to determine avian usage patterns.

Objective: Identify and conserve viable habitat for resident birds that use SNI for breeding, nesting, and feeding.

Objective: Continue to develop practical strategies that provide for the needs of federally-listed shorebirds and military values of the coastal strand/beach areas.

V. Monitor populations of resident land birds.

A. Support biannual counts (using established methodology) of resident land birds, to determine relative abundance of species during breeding and nonbreeding season.

1. Partner with the USFWS or other organizations when conducting point count surveys in order to support bird inventories for resident land birds.

B. Support additional surveys to determine the status of American kestrels.

C. Support winter surveys to determine numbers and locations of burrowing owls.

D. Investigate breeding bird use areas for land birds through using surveys that require a species-specific research design.

1. Support studies that investigate the habitat use of orange-crowned warblers on coreopsis or willow-patch.
2. Support studies that investigate the habitat use of house finches on cactus.

VI. Protect the sustainability of resident land bird populations and their habitat.

A. Set guidelines and standards for construction of towers and guy wires to reduce bird mortalities.

B. Whenever possible, conduct roadside and airfield mowing outside the breeding season of native ground nesting land birds. Promote understory and groundcover quality by postponing mowing until after peak breeding season. If mowing must be done during breeding season, maintain a low herbaceous layer of no more than six inches (15 cm) to discourage birds

from nesting there in the first place. Limit restoration activities and disturbance events such as grazing, disking, and herbicide application to the non-breeding season. When such actions are absolutely necessary during the breeding season, time disturbance to minimize its impacts on nesting birds.

C. Enhance important surface water areas used by resident land birds.

1. Continue Arundo donax removal and riparian restoration at Humphrey Sump.

2. Remove invasive non-native species at Humphrey Sump.

VII. Monitor resident shorebird populations and breeding colonies.

A. Develop a standard format and a database to collect and maintain records of shorebird observations on SNI.

B. Support studies that document the loss of sandy beach habitat to shorebirds as a result of the increased use of those areas by marine mammal pinnipeds.

1. Support studies that investigate potential negative interactions between special status avian species such as the western snowy plover and increased use of sandy beach habitat by marine mammal pinnipeds.

C. Increase the level of western snowy plover monitoring in order to capture nesting success.

D. Continue to investigate and assess military activity effects on migratory birds, such as nesting shorebirds, in order to comply with the Migratory Bird Rule.

E. Determine the status, health, and habitat use of certain target or indicator species not currently listed, including the black oystercatcher.

F. Use cooperative assistance from wildlife agencies, non-governmental organizations, and volunteers to collect needed data.

G. Continue efforts to keep island free of feral cats.

H. Dead birds found in areas not inhabited by humans should be left alone and reported to the Environmental office or collected and given to an appropriate facility.

VIII. Protect the sustainability of resident shorebird populations and their habitat.

A. Avoid shoreline construction that results in a loss of coastal strand/beach habitat, except for the currently planned improvement to the RO facility at Coast Guard Beach.

B. If it is determined that a non-native species is having a direct effect on a sensitive native resident shorebird species, then take appropriate removal actions for the pest.

IX. Monitor resident seabird populations and breeding colonies.

A. Increase seabird monitoring to capture nesting success.

B. Continue aerial surveys of Brandt's cormorants nesting colonies to determine distribution and breeding population size.

C. Investigate methods to assess distribution of western gull nest sites and reproductive success.

1. Support studies that investigate potential negative interactions of the redistribution of western gull nests into western snowy plover habitat.

D. Support outside research of seabird biology, interactions with mammalian predators, and impacts from increasing marine mammal presence.

E. Continue to investigate and assess military activity effects on migratory birds, such as nesting seabirds, in order to comply with the Migratory Bird Rule.

X. Protect the sustainability of resident sea bird populations and their habitat.

A. Maintain closure signs and gates around Brandt's cormorants nesting colonies.

B. Investigate feasibility of fencing cormorant colonies to keep out foxes.

C. Continue efforts to remove feral cats from SNI in support of the California WAP recommendation to expand efforts to eradicate introduced predators from all seabird colonies and also in support of the Montrose Settlements Restoration Program Final Restoration Plan to restore seabirds at SNI.

XI. Prepare educational materials regarding SNI's resident birds and management practices. Include information on what personnel can do to help, species lists, and activities detrimental to resident bird populations.

4.4.4 Terrestrial Mammals

Specific Issues for Terrestrial Mammals

- SNI has only two endemic terrestrial mammals, the San Nicolas Island fox and the San Nicolas Island deer mouse.
- The San Nicolas Island fox is susceptible to outbreaks of wildlife disease such as canine distemper and rabies.
- The San Nicolas Island deer mouse is a prey item to larger mammals such as the San Nicolas Island fox and to birds of prey.
- The San Nicolas Island deer mouse is a generalist feeder that is thought to play an important ecosystem role by feeding on larvae and pupae of terrestrial invertebrates that prey upon plant life.
- Rodent pest control practices, such as the use of rodenticide, poses a risk to endemic populations of the San Nicolas Island deer mouse and the San Nicolas Island fox.
- Evidence exists that small numbers of bats pass through and utilize SNI; however, uncertainty exists as to its status and trend on the Island.
- Continued monitoring of feral cats, which once posed a serious risk to the integrity of various avian, reptile, and mammal species, should continue to insure successful removal.
- Future introductions of terrestrial mammals such as rats may impact and compete with endemic mammals.

Current Management

Terrestrial mammals are currently managed from a habitat perspective through the utilization of the Site Approval and Project Review Process codified in NBVCINST 11010.1. The pest management and control program at SNI also contributes to endemic terrestrial mammal management by restricting the use of poison rodenticide bait for rodent control. Prohibiting domesticated dogs from accessing the Island also contributes to mammal management by avoiding harassment to endemic mammals and controlling a potential vector for wildlife disease.

Management of feral cats on SNI is guided by the EA for a feral cat removal and seabird restoration program, which became Final in 2009. Cats are being removed from SNI in 2009-2010 through a combination of techniques, including live trapping, spotlight hunting, and hunting with specialized dogs (USFWS 2009). This feral cat removal program takes into account impacts to native mammal populations while monitoring diligently for invasive species.

At this time there are no conservation plans for the San Nicolas Island fox; however, a Draft Candidate Conservation Agreement has been submitted to the USFWS and may need further review before it is implemented. Navy biologists at SNI do monitor the San Nicolas Island fox population by utilizing grids and live trapping to estimate the abundance of this species over time. Navy biologists also follow some of the recommendations made in the "Recovery Strategy for Island Foxes on the Northern Channel Islands" such as a vaccination program that inoculates some of the population against canine distemper and rabies (Coonan 2003).

Assessment of Current Management at SNI

Current management of terrestrial mammals provides adequate capacity for inventory and habitat protection efforts as well as addressing concerns for the threat of an outbreak of wildlife disease. Interaction between the environmental program and the pest management and control program have enabled integrated pest management efforts to be compliant with environmental requirements, such as avoiding rodenticide use in developed areas to minimize the risk of poisoning endemic San Nicolas Island deer mouse populations. There are no threats to the San Nicolas Island deer mouse population given this current capacity and ability to coordinate with pest management activities. Furthermore, monitoring of the endemic deer mouse populations would be valuable because of their abundance and their twin roles as important plant and seed consumers, and as prey for mammalian and avian predators on the island.

Management of the San Nicolas Island fox will continue to benefit from efforts to develop a Draft Candidate Conservation Agreement between the Navy and the USFWS for the Island fox. Implementation of such an agreement would formalize education, monitoring, necropsy, and management. There also exists a need to have adequate management capacity to detect early and respond quickly to future threats to mammal populations such as an incident of disease outbreak. If such an incident were to occur there is a need to discover mortality events early. Questions remain as to the efficacy of using remote monitoring technology to be able to monitor a mortality event. In order to prevent a wildlife disease incident to occur in San Nicolas Island fox populations, management will continue with the fox vaccine program that targets distemper and rabies.

Management Strategy

Objectives and Strategies for Terrestrial Mammals

Objective: Provide for healthy populations of native mammals by identifying and conserving for diverse native habitats and habitat conditions that support mammals and ensuring that trade-offs of all military and biological projects to native mammals are considered in planning.

I. Support small mammal monitoring programs at SNI that assess home range, movement patterns, and prey abundance for mammalian predators.

- *A.* Use the San Nicolas Island deer mouse as an indicator species for a small mammal monitoring program.

II. Support programs that contribute to maintaining endemic populations of the San Nicolas Island deer mouse and the San Nicolas Island fox.

- *A.* Continue to focus on mapping populations of the San Nicolas Island fox and San Nicolas Island deer mouse in order to identify their preferred habitat types and subsequently ensure that management measures protect those areas.

III. Support programs to inventory and monitor bat populations on SNI.

■ **For more information regarding San Nicolas Island fox management refer to *Section 4.5.2.5: San Nicolas Island Fox - State Threatened*.**

■ **For more information regarding feral cat management at SNI refer to *Section 4.7.2: Pest/Predator Control*.**

4.4.5 Marine Macroalgae and Plants

Specific Concerns

- Extractive uses, non-native invasive species, and climate change threaten the condition and biodiversity of marine macroalgae and plant communities. This in turn may affect the abundance and diversity of fish and wildlife.

- There is uncertainty if the current documentation and mapping of habitat is sufficient to make decisions on avoidance and minimization with respect to sensitive resources; much of the existing information on marine macroalgae and plants is anecdotal and maps are not of sufficient resolution to quantify the status and trend of populations.

Current Management

Current management of marine macroalgae and plants below the shoreline to three nautical miles is the responsibility of the state of California. San Nicolas Island supports the mission and regulations of the state of California by collaborating with aerial surveys used to estimate the surface coverage of giant kelp and intermittent subtidal surveys to examine various habitats. San Nicolas Island performs intertidal and subtidal monitoring of marine macroalgae and plants related to ASBS compliance as well as supports associated research conducted by other federal agencies and higher learning entities.

Assessment of Current Management at SNI

The current understanding and documentation of marine macroalgae and plants associated with SNI is primarily derived from studies conducted by various state and federal resource agencies and universities examining specific species or assemblages. Sufficient data sets, pertaining to macroalgae species, exist for waters surrounding SNI documenting dominant species and habitat types. Limited data defining Special Aquatic Sites (eelgrass communities) have been developed over the years but only a small amount of that habitat is thought to present in the nearshore waters of SNI. Monitoring of macroalgae and plants performed for ASBS compliance achieves regulatory responsibilities but is inadequate to evaluate vulnerability, avoidance conflicts with the military mission, or assess ecosystem health. Currently operational activities only indirectly interface with these habitats via storm water runoff; BMPs and the NEPA site approval and project review board are also in place to avoid or minimize potential impacts.

Management Strategy

Objective and Strategies for Marine Macroalgae and Plants

Objective: Support monitoring of intertidal and subtidal ecosystems in and around San Nicolas Island to obtain baseline information and integrate with existing long term monitoring programs within the Channel Islands, in order to facilitate conservation decisions.

I. Develop community-level marine macroalgae and plants baseline information.

A. Participate in a scientifically recognized program to monitor marine macroalgae and plants.

B. Continue monitoring water quality focusing on canyon outflows and those areas used for the ASBS Monitoring Program.

II. Support the focused management of marine macroalgae and plants.

A. Document the extent of existing eelgrass communities.

B. Ensure no net loss to current eelgrass habitat around SNI and inform operators that this species is protected.

C. Support annual aerial kelp surface coverage monitoring and integrate annual coverages into GIS database

III. Survey subtidal and intertidal areas near high use locations (piers and barge landing areas) for the introduction of non-native invasive species.

4.4.6 Marine Invertebrates

Specific Concerns

- The population of abalone species native to SNI have declined dramatically.
- Erosion on SNI and storm water runoff could affect water quality around the island.
- The introduction of a non-native invasive algae or new competitor/predator could devastate marine invertebrate populations around the Island.
- Overutilization of fisheries targeting marine invertebrates may impact ecosystem health.

Current Management

Commercial fishing for invertebrates and fish species within subtidal waters of SNI has a long and colorful history. The island historically contributed significant annual catches of sea urchins, abalone, lobster, squid and finfish over the decades. Currently lobster and squid make up the majority of annual revenue generated from commercial fisheries at SNI.

Current management of marine invertebrates below the shoreline to three nautical miles is the responsibility of the state of California. SNI supports the mission and regulations of the state of California by collaborating with various state and federal resource agencies and universities acquiring baseline information. SNI performs intertidal and subtidal monitoring of marine invertebrates to comply with ASBS regulatory standards.

Assessment of Current Management at SNI

Current management of marine invertebrates provides only rudimentary baseline inventory and habitat information sufficient to document dominant species for the majority of constituents. Some species specific comprehensive studies capable of tracking potential effects and assessing management objectives exist for a few identified sensitive species, such as black abalone.

An emerging management concern is the black abalone and the potential for NMFS to establish critical habitat designations on SNI. Focused studies documenting the trend of SNI black abalone populations needs to be consistently performed in conjunction with completing complementary monitoring of adjacent habitat. Additionally the historic presence of the federally endangered white abalone should be assessed and potential vulnerabilities of oil spills addressed.

Overall a comprehensive monitoring protocol capable of documenting the current status of the intertidal ecosystem is absent. While some baseline data are available, the lack of a consistent and ongoing data collection on whole ecosystems limits the installation's ability to evaluate vulnerability and effectiveness at estimating potential effects from either natural or anthropogenic effects. A need exists to investigate broad marine invertebrate populations and their associated habitats through the implementation of a scientifically valid methodology able to document current conditions and track the trend of key communities.

Management Strategy

Objectives and Strategies for Marine Invertebrates

Objective: Continue to assist and support the acquisition and development of baseline information on the status of marine invertebrate populations around San Nicolas Island, in relation to other Channel Islands.

I. Implement a consistent monitoring program for marine invertebrates at SNI.

A. Work collaboratively with state and federal agencies to implement and continue to fund monitoring of existing SNI intertidal invertebrate populations using standardized monitoring protocols utilized throughout the other Channel Islands.

B. Continue programs and collaborative efforts to minimize impacts and protect the federally listed and species warranting Navy stewardship to the maximum extent practicable.

C. Promote and discuss current long term monitoring of black abalone populations established in the late 1970s (VanBlaricom 1993) and ensure that cooperative research agreements are developed to insure that survey information on existing populations and trend are made available to the general scientific community. Special attention will be placed on protected and endangered resources, including marine mammals and black abalone. Training will rely on existing and new pamphlets/brochures and signage on the island to raise awareness. Numbers of participants receiving training will be tracked to ensure strategy is effectively implemented.

D. Investigate the potential for remnant populations of white abalone, compile existing information, and document historical occurrences for future NEPA considerations.

4.4.7 Fishes

Specific Concerns

- Abundant fish assemblages native to surrounding waters of SNI have declined; concomitant federal and state conservation measures that may impact military use and operations are being developed.
- There is uncertainty if changes in fish populations may negatively impact federally endangered or threatened species or species warranting navy stewardship.
- There is uncertainty how overutilization of fisheries may impact ecosystem health.

Current Management

Current management of marine fishes out to three nautical miles is the responsibility of the state of California. The harvesting of fish and shellfish in SNI waters is managed directly by CDFG. Ocean fishing regulations are drafted by the Marine Region, reviewed in public hearings, revised if needed, and adopted by the Fish and Game Commission. Emergency actions to close a fishery temporarily can be taken on short notice, following approval by the Commission and the Office of Administrative Law. Such action was taken in 1998 to close the red abalone fishery in California (CDFG 2002). The fishery was permanently closed through legislation SB463 in 1997.

Harvest regulation seeks to manage sustainable populations through a combination of techniques: area and seasonal closures; gear limitations; and size, catch, and possession limitations. SNI supports the mission and regulations of the state of California by collaborating with the development of management and conservation areas. SNI performs basic fish monitoring related to ASBS compliance as well as supports associated research conducted by other federal agencies and higher learning entities.

SNI's abundant marine life, including fishes, while generally only indirectly affected by military activity, requires consideration in daily management as well as for NEPA and Magnuson-Stevenson Act compliance. CDFG currently monitors fish populations in several ways including fishery dependent data obtained by the surveying of commercial and recreational fishing vessels. Fisheries independent data is collected by intermittent surveys performed by CDFG and NMFS and typically focuses on commercially important species assemblages and species of concern.

CDFG has taken steps to address the current lack of personnel and financial resources by implementing the Cooperative Resource Assessment of Nearshore Ecosystems (CRANE) project with university scientists and other resource agencies. This highly collaborative program started in 2002 and collected habitat, biological, and oceanographic data by means of scuba diver- and remotely operated-vehicle surveys in shallow rocky reef habitats along the coast of California. CRANE surveys were repeated at SNI in 2009 but are not planned for future years.

Assessment of Current Management at SNI

Considering the isolated nature of SNI and the distance from the mainland, fishing pressure on SNI is substantially less than the other Channel Islands.

The current understanding and documentation of fishes associated with SNI is primarily derived from studies conducted by various state and federal resource agencies and universities examining specific species or assemblages. Existing data sets, pertaining to marine fishes, for waters surrounding SNI are focus on commercially important species. Limited information is currently available on fish habitat associations examining community relationships and ecosystem health. Currently operational activities on SNI only occasionally interface with fish and their associated habitat through erosion or storm water runoff and more directly from intermittent take by island personnel. A need exists to investigate marine fish populations and their associated habitats through the implementation of a scientifically valid methodology able to document current conditions and track the trend of important constituents.

Management Strategy

Objectives and Strategies for Marine Fishes

Objective: Partner in long-term baseline monitoring occurring throughout the Channel Islands and make data available to the scientific community.

I. Support the development of a consistent monitoring program to evaluate fish species.

A. Support the California MLPA by assisting with implementation of the proposed Begg Rock State Marine Reserve.

B. Increase environmental education programs for transient and island personnel and make available informational literature and signs to raise awareness of threats, concerns, and management needs for marine species.

C. Work collaboratively with state and federal agencies to implement and fund monitoring of existing SNI populations using standardized monitoring protocols utilized throughout the other Channel Islands and California.

D. Conserve and protect kelp forests habitat to maintain its function as a food source, nursery, and protective environment for various fish species.

4.4.8 Marine Mammals

Specific Concerns

- There is uncertainty if disturbance of marine mammals from anthropogenic activities may alter their behavior and breeding success.
- There is uncertainty how the effects from global climate change may affect the distribution and abundance of marine mammals species observed in the vicinity of SNI.
- Marine mammal populations can fluctuate widely depending on prey abundance.
- There is the possibility of disease outbreak within managed marine mammal populations.
- There is uncertainty if the expansion of existing marine mammal populations may reach a threshold that creates conflicts with the management of sensitive coastal habitat or other special status species.
- Formalize and complete the standardized protocol for addressing large stranded marine mammals at or near SNI.

Current Management

The MMPA establishes conservation of marine mammals as well as making the take or import of those animals illegal, with specific exceptions, primarily for subsistence fishing. The USFWS is responsible for shore-using and near-shore mammals (such as sea otters). Those mammals that are truly marine inhabitants, cetaceans and pinnipeds, other than walrus, are the responsibility of NMFS. The USFWS may authorize and permit take (with limitations and mitigation measures) of marine mammals under their purview. Pinniped and southern sea otter occurrence on SNI is discussed in *Section 3.7.4: Marine Mammals*.

Similar to USFWS regulatory oversight, the NMFS is authorized to grant exemptions to the take moratorium and typically requires the collection of observation and data collection on the extent of authorized incidental take. The NMFS, upon application from the Navy, issued regulations (50 CFR 216.151-158) to govern the unintentional takings of small numbers of marine mammals incidental to missile launch operations from SNI. These regulations allow NMFS to issue annual LOAs to the Navy in accordance with Section 101 (a)(5)(D) of the MMPA (USDON 2005a). The Small Take Regulations address impacts to the northern elephant seal, California sea lion, and harbor seal. Letters of Agreement are applicable for a one-year period, at the end of which, a new authorization can be obtained; up to five years, which is the limitation of the regulations.

Specific effects addressed in the regulations are primarily related to noise, such as startle responses (e.g. stampeding) and physiological stress. A suite of mitigation measures and monitoring and reporting requirements are required by the regulations to minimize these potential harassment-related takes. Current management of marine mammals at SNI is accomplished through the LOA in conjunction with the NMFS and is overseen by SNI staff biologists.

Assessment of Current Management at SNI

Current management of marine mammals provides adequate capacity for resource and habitat protection efforts. Interaction between the SNI environmental program and the NMFS enables adaptive management to ensure island operations remain compliant with regulatory requirements. There are no current threats to the San Nicolas Island marine mammal populations given the current status of individual species and their increasing numbers.

Management Strategy

Objectives and Strategies for Marine Mammals

Objective: Maintain compliance with MMPA mandates.

I. Continue to monitor marine mammal populations and evaluate interactions related to island activities.

- *A.* Ensure that activities that affect marine mammals are accomplished in accordance with the MMPA.
- *B.* Apply for required authorizations as early in the project planning process as practicable for actions that may impermissibly impact marine mammals.
- *C.* Comply with conditions contained in regulations or authorizations granted to the Navy by the NMFS or the USFWS.
- *D.* Maintain compliance with the MMPA by continuing the year-round closure of the south side to unauthorized activities.
- *E.* Maintain compliance with the MMPA by seasonally closing north-side breeding and haul out sites to incompatible and unauthorized activities.

II. Monitor and protect island-wide pinniped breeding and haul out sites.

- *A.* Maintain minimum flight level of 1,000 feet (305 m) over shoreline when pinnipeds are present in accordance with the Small Take Regulations.

B. Continue aerial breeding season surveys for northern elephant seals and California sea lions in cooperation with the NMFS to gather data on distribution, abundance, age structure, pup production, and reproductive phenology.

C. Continue aerial breeding season survey for harbor seals in cooperation with the NMFS to determine pup production and total population.

D. Maintain closure signs around breeding and haul out sites.

E. Continue educational instruction on marine mammal issues and individual responsibility for island personnel.

F. Continue to provide support for pinniped research.

III. Maintain adaptive management strategies to address complex issues related to marine mammal resource conflicts and occurrence.

A. Examine current exclusion practices and propose a pilot exclusion activity focused on excluding pinnipeds from sensitive western snowy plover nesting areas and threatened plant species.

B. Complete and formalize marine mammal stranding protocol to address scientific evaluations of rare or unusual occurrences.

C. Maintain signs that warn island personnel of the location of sensitive marine mammal areas.

D. Update the educational kiosk on SNI.

4.5 Special Status Species Protection

4.5.1 Federally Listed Species and Critical Habitat

Specific Concerns

The ESA was revised via the NDAA of 2004 (PL 108-136) to recognize INRMP conservation measures and species benefit that could obviate the need for critical habitat designation on Navy lands. All Navy installations with federally listed threatened or endangered species, proposed federally listed threatened or endangered species, candidate species, or unoccupied habitat for a listed species where critical habitat may be designated, must structure the INRMP to avoid the designation of critical habitat. The INRMP may obviate the need for critical habitat if it specifically addresses both the benefit provided to the listed species and the provisions made for the long-term conservation of the species. The species benefit must be clearly identifiable in the document and should be referenced as a specific topic in the INRMP table of contents.

The USFWS uses a three-point criteria test, to determine if an INRMP provides a benefit to the species. An installation is strongly encouraged to use these USFWS criteria, listed below, when structuring its INRMP to avoid the need for critical habitat designation.

1. The plan provides a conservation benefit to the species. The cumulative benefits of the management activities identified in a management plan, for the length of the plan, must maintain or provide for an increase in a species population, or the enhancement or restoration of its habitat within the area covered by the plan (i.e. those areas deemed essential to the conservation of the species). A conservation benefit may result from reducing fragmentation of habitat, maintaining or increasing populations, insuring against catastrophic events, enhancing and restoring habitats, buffering protected areas, or testing and implementing new conservation strategies.
2. The plan provides certainty that the management plan will be implemented. Persons charged with plan implementation are capable of accomplishing the objectives of the management plan and have adequate funding for the management plan. They have the authority to implement the plan and have obtained

all the necessary authorizations or approvals. An implementation schedule, including completion dates, for the conservation effort is provided in the plan.

3. The plan provides certainty that the conservation effort will be effective. The following criteria will be considered when determining the effectiveness of the conservation effort. The plan includes: (1) biological goals (broad guiding principles for the program) and objectives (measurable targets for achieving the goals); (2) quantifiable, scientifically valid parameters that will demonstrate achievement of objectives and standards for these parameters by which progress will be measured are identified; (3) provisions for monitoring and, where appropriate, adaptive management; (4) provisions for reporting progress on implementation (based on compliance with the implementation schedule) and effectiveness (based on evaluation of quantifiable parameters) of the conservation effort are provided; and (5) a duration sufficient to implement the plan and achieve the benefits of its goals and objectives.

Current Management

Activities relating to, and management of federally threatened and endangered species on SNI are primarily guided by the terms and conditions of the BO for Activities on San Nicolas Island, California (1-8-01-F-14). Annual BO reports are provided to the USFWS to discuss impacts from activities to the western snowy plover and island night lizard.

The current management of federally threatened and endangered species populations of SNI are addressed through the INRMP at both the individual and community level by avoidance, minimization, and monitoring measures developed to achieve conservation benefits. Conservation efforts and strategies at SNI have been implemented with approval and funding from the SNI command and follow recognized monitoring methodologies. Annual INRMP metric updates provide a formal means to utilize adaptive management and review progress made for protecting and conserving the federally threatened and endangered species at SNI.

Assessment of Current Management at SNI

SNI is in the early stages of documenting and reporting its achievements under the USFWS three-point criteria for avoiding critical habitat designation for the western snowy plover. Other than this, current management of threatened and endangered species on SNI is adequate to maintain compliance responsibilities, identify threats, and minimize potential impacts. Current communication and partnerships with federal and state regulatory agencies is providing an adaptive management framework able to sustain the military mission while insuring long-term conservation of the species. The Navy is participating as a member on NMFS black abalone critical habitat committee and working directly with NMFS to ensure protection of black abalone on SNI.

Management Strategy

Objective and Strategy for Federally Listed Species

Objective: Protect and maintain viable populations of threatened and endangered species and maintain compliance with ESA requirements.

I. Ensure that land use plans and activities in or near threatened or endangered species habitats are accomplished in accordance with the ESA.

A. Conduct formal and informal consultations with the USFWS and NMFS as early as practicable in the project planning process for actions that may affect listed species in accordance with ESA Section 7 Consultation Handbook (USFWS/NMFS March 1998).

B. Comply with requirements of species or site-specific consultations and with terms and conditions of Section 7 Consultation BOs. Consider Conservation Recommendations provided in Section 7 Consultation BOs.

C. Comply with the Incidental Take Statement in the USFWS 2001 BO (USFWS 2001).

D. Consider Conservation Recommendations (USFWS 2001) regarding San Nicolas Island fox, domestic pets, feral animal removal, and listed species research permits.

II. Monitor and conduct censuses of the listed species covered under a BO for Activities on SNI (USFWS 2001), for the purpose of monitoring the effects of Navy activities on these species in accordance with the Terms and Conditions listed in the BO.

A. Monitor the barge landing area and other areas of concentrated human activity for non-native species and remove any such species found in accordance with the Terms and Conditions listed in the USFWS 2001 BO (USFWS 2001).

B. Provide the USFWS an annual report containing the number of island night lizards, California brown pelicans, and western snowy plovers killed or injured by Navy activities, and a summary of Navy activities and their effects on listed species in accordance with the Reporting Requirements in the USFWS 2001 BO (USFWS 2001).

III. Review all existing and new structures to determine which shall be fitted with materials to prevent their use as perches by predatory birds in accordance with the Terms and Conditions listed in the USFWS 2001 BO (USFWS 2001).

4.5.1.1 Island Night Lizard - Federally Threatened

Specific Concerns

- The island night lizard is the only endemic reptile species on SNI.
- The island night lizard is a species with low fecundity which makes it sensitive to disturbance and impacts from human activity.
- Argentine ants are an invasive terrestrial invertebrate species which represent a potential future threat to island night lizard populations at SNI.
- Removal of island night lizards by island personnel for pets or sale.

Current Management

Management of the island night lizard on SNI, like most contemporary natural resources management programs on the Island, is ESA compliance-driven by BO, rather than within an ecosystem approach. A programmatic BO for Activities on San Nicolas Island (1-8-01-F-14) was issued on 15 October 2001. This BO addresses missile and target launches, barge operations, proposed pier construction, reverse osmosis plant operation, equipment/materials storage and staging areas, debris removal, roadside maintenance, recreation, natural resource research and management, amphibious training exercises, explosive ordnance disposal, proposed multi-purpose instrumentation sites, and routine small construction projects and utilities maintenance. This BO includes an Incidental Take Statement for the island night lizard as well as discretionary reasonable and prudent measures and non-discretionary terms and conditions that identify conservation measures to support the recovery of SNI's population. A completed five year review of the island night lizard in California (72 FR 7064) did not recommend a change for the status of the SNI island night lizard population.

Surveys are conducted by the USGS to monitor island night lizard populations; these surveys are programmed for funding every five years. At a minimum there is intermittent monitoring of island night lizard populations conducted by Navy staff every five years.

Impacts to island night lizard habitat are generally avoided and minimized through the NEPA Site Approval and Project Review Process codified in NBVCINST 11010.1. BMPs have also been developed and implemented to avoid and minimize impacts to island night lizard habitat.

Assessment of Current Management at SNI

The island night lizard is affected by the actions of humans and predation. Construction activities pose the greatest threat to island night lizards. Site specific surveys are conducted when development projects are being reviewed through the Site Approval and Project Review Process. Habitat enhancement projects are also considered to support the viability and stability of the island night lizard population.

Management Strategy

Objective and Strategy for the Island Night Lizard

Objective: Maintain a viable population of Island night lizards on SNI.

I. Continue to develop and implement protocols to resolve any baseline biological data gaps and to monitor distribution, population size, population trends, and habitat usage of the Island night lizard population.

A. Conduct site-specific surveys in known or suitable habitat prior to disturbance activities.

II. Protect and maintain island night lizard habitat quality and integrity.

A. Conduct an invasive non-native control, monitoring, and removal program in Island night lizard habitat in order to reduce impacts upon the Island night lizard population.

B. Define and clearly mark work areas during road maintenance and other activities to prevent island night lizard mortality in accordance with the Terms and Conditions listed in the BO (USFWS 2001).

C. Exclude high quality lizard habitat areas from the roadside-mowing regime.

D. Maintain a bare ground buffer zone around equipment and storage areas in high quality island night lizard habitat where practicable.

E. Site staging areas for storage of equipment and materials in areas with low island night lizard densities, whenever feasible.

III. Conduct relocation of island night lizards in accordance with the Terms and Conditions identified in the current BO (USFWS 2001).

IV. Support studies to investigate the effectiveness of island night lizard management strategies.

A. Support scientific studies of competition relationships between alligator lizards and island night lizards.

B. Support genetic studies of isolated island night lizard populations to determine population structure and size.

V. Educate island personnel on laws covering prohibition on taking listed species for pets or for sale in pet trade.

VI. Support recovery plan efforts to establish stable island night lizard populations and eventual delisting.

A. Support Channel Islands-wide review of population status of the species.

4.5.1.2 Western Snowy Plover - Federally Threatened

Specific Concerns

According to BO for Activities on San Nicolas Island, California (1-8-01-F-14) and the western snowy plover recovery plan (USFWS 2007) current threats to the recovery of the western snowy plover include:

- Habitat loss and fragmentation from development.
- Mortality, injury, and disturbance resulting from overutilization due to military and human activities.
- Displacement from preferred nesting areas as a result of increasing pinniped populations, disturbance by humans, and predation.
- Natural and anthropogenic factors, such as inclement weather, oil spills, and management of other special status species that may have an affect on the quality and quantity of western snowy plover habitat.

Current Management

Consistent biannual western snowy plover monitoring has been conducted since 1995. After the implementation of a BO in 1997 monitoring and annual surveys for the western snowy plover became a required natural resource management action.

Continued implementation of the discretionary conservation measures and reasonable and prudent measures, and the non-discretionary terms and condition identified in the BO for activities on San Nicolas Island, California (1-8-01-F-14) and other SNI management measures has been sufficient to preclude the designation of critical habitat as well as provide adequate detail to the status and trend of the western snowy plovers at SNI for over fifteen years. Other SNI management measures include but are not limited to the following activities:

- Beach closures to recreational use and human access during breeding season;
- Permitting only necessary activities to take place in coastal habitat in order to avoid impacts to breeding habitat; and
- Scheduling routine maintenance for coastal facilities outside of breeding season.

Exclusion of the general public to SNI in conjunction with beach specific access and use limitations of island personnel and activities reduces the potential for incidental impacts and develops resource awareness. Island resource managers have developed detailed maps of important habitat areas and continue to document threats from increasing populations of marine mammals.

Assessment of Current Management at SNI

Current management of western snowy plovers, in the context of the federal ESA, provides adequate capacity for inventory, habitat protection, and avoiding and minimizing impacts from military activities.

Interaction between the environmental program and regulatory agencies is compliant with environmental requirements, such as reporting the status of the population and the effectiveness of implemented conservation efforts. Concerns regarding the SNI western snowy plover population is primarily related to interspecies habitat competition and anthropogenic threats.

Management Strategy

Objective and Strategy for Western Snowy Plover

Objective: Protect, monitor and maintain a viable population of western snowy plovers.

I. Protect western snowy plover populations and habitat.

A. Maintain compliance with the ESA by closing nesting areas to recreational activity during the March 1 - September 15 breeding season. Alternative measures to ensure compliance will be evaluated periodically.

B. Maintain signs around breeding sites to alert personnel of closures.

C. Conduct an invasive non-native control, monitoring, and removal program in western snowy plover habitat to reduce impacts upon the western snowy plover population.

D. Remove unnecessary structures in snowy plover nesting areas in accordance with the Terms and Conditions of the BO (USFWS 2001) and attach avian excluders to essential structures, if feasible.

E. Conduct amphibious training exercises on beaches not harboring nesting snowy plovers.

II. Monitor Western snowy plover populations and habitat.

A. Conduct island-wide snowy plover censuses twice annually, once during the breeding season and once during the winter season. Alternative monitoring programs may be implemented if they are determined to provide adequate monitoring data.

B. Monitor snowy plover nests during missile or target launches, general operations, and other activities that may disturb nesting behaviors in accordance with the Terms and Conditions listed in the BO (USFWS 2001).

C. Conduct site-specific snowy plover surveys in potential or known breeding habitat prior to disturbance activities as required by the BO (USFWS 2001).

D. Increase efforts to determine nesting success of snowy plovers.

III. Support research to explore the effects of increasing pinniped populations on nesting success of snowy plovers.

IV. Educate island personnel regarding protected species regulations and responsibilities.

V. Develop and maintain a computer database for storing information on locations of nesting sites, incidental sightings and size and results of surveys for resource management purposes.

VI. Support recovery plan efforts to establish stable western snowy plover populations and eventual delisting.

A. Continue to participate with recovery planning and other efforts to help establish stable snowy plover populations.

4.5.1.3 Black Abalone - Federally Endangered

Specific Concerns

- The present or threatened destruction, modification or curtailment of its habitat or range (i.e. suboptimal water temperatures associated with effluents, El Niño-Southern Oscillation events, and long-term climate change, and, to a lesser extent, substrate destruction and reduced food quality and/or quantity).
- Overutilization (i.e. poaching).
- Disease (i.e. withering syndrome) or predation.
- Natural (i.e. environmental pollutants) and anthropogenic factors (i.e. toxins) (Butler 2009).
- There is uncertainty if critical habitat may be designated by the NMFS for black abalone populations at SNI.

Current Management

Ongoing long-term black abalone research, performed by Dr. VanBlaricom and supported by the islands command since the 1970s, provides one of the most important population studies on the species within the SCB. Dr. VanBlaricom began studying the distribution of black abalone in 1981 and continues to be involved in an annual monitoring effort to document trends in black abalone populations at SNI; however, data

have not been published (Merkel and Associates Inc. 2007). Dr. VanBlaricom's studies provide valuable trend data on the status of the black abalone as well as identifying sensitive areas and potential vulnerabilities from both natural and anthropogenic impacts. The CDFG also conducted black abalone surveys at Corral Harbor annually from 1992-1996 and revisited this site, along with a new site to the west of Corral Harbor in 2010.

The island's rocky intertidal habitat along the shorelines of SNI are designated restricted access to the general public that has historically partially protected the population from extractive uses. Cooperation with the CDFG in enforcing the restricted areas and support of USGS studies evaluating rocky intertidal habitat has developed data on existing conditions and promotes natural resource stewardship.

Certain areas of the Island are also are restricted to access by Navy staff and Island personnel. The southern shoreline is one area where all access is restricted due to marine mammal and seabird protective measures. This access restriction also ensures that any anthropogenic disturbance or impacts are avoided to black abalone habitat in the rocky intertidal zone. Due to the rugged terrain, limited access, signage and oversight by security, compliance with these area restrictions is high.

Impacts to black abalone habitat are also generally avoided and minimized through the NEPA Site Approval and Project Review Process codified in NBVCINST 11010.1.

Assessment of Current Management at SNI

Current management through ongoing monitoring efforts at multiple locations on SNI in conjunction with long term monitoring at the other Channel Islands provides federal and state regulators invaluable data on the trend of the black abalone population over the central portion of its range. The listing of black abalone as a federally endangered species in January 2009 requires that the Navy consider this species as a management focus species and support surveys and other conservation measures for the protection and maintenance of this population. The current black abalone monitoring efforts conducted by Dr. VanBlaricom provide a sufficient baseline of information, but should be integrated into the standardized regional protocol used within the other Channel Islands and be supplemented with community ecology studies to examine habitat associations. Continued implementation of the NEPA Site Approval and Project Review Process for projects that will impact the rocky intertidal zone will help avoid and minimize impacts to SNI's black abalone population.

Management Strategy

Objective and Strategies for Black Abalone

Objective: Protect California black abalone habitat and existing populations.

I. Continue to conduct presence and absence surveys where suitable habitat exists and develop annual abalone monitoring protocols.

  A. Map current survey sites established by Dr. VanBlaricom in the 1970s to establish functional GIS layers to facilitate management decisions and inform project review boards.

II. Implement complementary baseline surveys to provide additional information on current conditions and establish regular monitoring intervals.

  A. Support establishment of rocky intertidal sites on SNI using accepted scientific methodologies to provide complementary data sets documenting trends of key rocky intertidal species assemblages.

  B. Support scientific studies to investigate recruitment and predation.

  C. Support the monitoring of key environmental variables that may play an important role in modulating population dynamics.

III. Develop educational materials for personnel and visitors informing them of black abalone issues and their role in helping to preserve the species.

IV. Continue to support appropriate closures at SNI.

A. Continue the SNI south side area closures, limiting access to and protecting habitat for the largest known black abalone population sites.

V. Continue to review all military activities to ensure compliance with ESA and avoid or minimize impacts to black abalone.

VI. Integrate historical monitoring data sets into SNI databases for management consideration.

VII. Support recovery plan efforts to establish stable black abalone populations.

A. Support Channel Islands-wide review of population status of the species.

4.5.1.4 White Abalone - Federally Endangered

Specific Concerns

- Potential impacts of future projects that could destroy, alter, or curtail habitat, such as dredging operations, cable repairs/construction, and nearshore military operations (NMFS 2008a).
- There is uncertainty of the status and trend of white abalone populations at SNI.

Current Management

Prior to the listing of white abalone under the ESA, the state of California closed the white abalone fishery in 1996 and subsequently closed all abalone fisheries in central and southern California in 1997 (NMFS 2009d). National Marine Fisheries Service published a final rule listing the white abalone as an endangered species under the ESA on 29 May 2001 (66 FR 29046) (NMFS 2001). In October 2008, the NMFS White Abalone Recovery Team published the final recovery plan for the white abalone (NMFS 2008a) and announced that Plan in the Federal Register (73 FR 62257).

No current surveys are conducted specifically to identify white abalone population baseline levels at SNI. Rather, white abalone management is accomplished through nearshore habitat management and compliance with ASBS conservation measures.

Assessment of Current Management at SNI

White abalone populations in the nearshore waters surrounding SNI are managed by the CDFG and the NMFS. Nearshore habitat management and compliance with ASBS conservation measures may be sufficient to protect and maintain white abalone populations at SNI.

Management Strategy

Objective and Strategies for White Abalone

Objective: Protect and maintain viable populations of white abalone in suitable rocky substrate habitat at SNI.

I. Support efforts to identify white abalone habitat and densities of individuals around SNI.

A. Support regular surveys and integrate historical data sets into SNI databases for management consideration.

B. Support mapping of current survey sites to establish functional GIS layers to facilitate management decisions and project review boards.

II. Implement complementary baseline surveys to provide more obtainable information on current conditions and establish regular monitoring intervals.

A. Support scientific studies to investigate recruitment and predation.

III. Support recovery plan efforts to establish stable white abalone populations.

A. Support Channel Islands wide review of population status of the species.

4.5.1.5 Guadalupe Fur Seal - Federally Threatened

Specific Concerns

- There is uncertainty if there is a sufficient monitoring program to observe the presence of Guadalupe fur seals on SNI.
- There is uncertainty if current military uses harass Guadalupe fur seals and reduce the probability that individuals will haul out and breed on SNI.
- Occurrences of sightings of Guadalupe fur seals are very rare on SNI.

Current Management

On 16 December 1985 (50 FR 51252) the NMFS determined that the Guadalupe fur seal should be listed as a threatened species under the ESA. Concurrent with this rule, the USFWS amended the U.S. List of Endangered and Threatened Wildlife by adding the Guadalupe fur seal as a threatened species. The designation of the Guadalupe fur seal as a threatened species under the ESA automatically qualifies this species as a depleted and strategic stock under the MMPA. Critical habitat was not established because the only areas that are essential to the conservation of the species and may require special management consideration or protection are outside of the jurisdiction of the U.S. The state of California has also listed the Guadalupe fur seal as a fully protected mammal in the Fish and Game Code of California (Chap. 8, sec. 4700, d), and it is listed also a threatened species in the Fish and Game Commission California Code of Regulations (Title 14, sec. 670.5, b, 6, H).

National Marine Fisheries Service, upon application from the Navy, issued regulations (50 CFR 216.151-158) to govern the unintentional takings of small numbers of marine mammals incidental to missile launch operations from SNI. These regulations allow NMFS to issue annual LOAs to the Navy in accordance with Section 101 (a)(5)(D) of the MMPA. The Small Take Regulations address impacts to the northern elephant seal, California sea lion, and harbor seal. Data collection activities for these species are typically a component of the take authorization and observations of other species, such as the Guadalupe fur seal, may be recorded during these marine mammal surveys. These surveys associated with the LOAs are applicable for a one year period, at the end of which, a new authorization can be obtained; up to five years, which is the limitation of the regulations. Navy staff do not explicitly survey for Guadalupe fur seals on SNI.

Assessment of Current Management at SNI

Sandy beach habitat management and compliance with ASBS conservation measures are necessary to support marine mammals, such as the Guadalupe fur seal, which haul out and use sites at SNI to breed. Marine mammal monitoring activities are generally related to the surveys used to support compliance with the NMFS LOA. There is uncertainty if these NMFS LOA surveys that target northern elephant seals, California sea lions, and harbor seals may be sufficient to identify population baseline levels for the Guadalupe fur seal individuals that haul out and breed on SNI. The Navy will continue to support NMFS LOA surveys with other federal partners such as NOAA. Management must balance the need for focused monitoring of the Guadalupe fur seal with the fact that focused surveys for Guadalupe fur seals would impact and harass other marine mammals present at haul out locations. If sightings of Guadalupe fur seals become more prevalent on SNI then other management measures will be taken.

Management Strategy

Objective and Strategies for the Guadalupe Fur Seal

Objective: Resolve baseline biological data gaps for Guadalupe fur seal populations at SNI.

I. Support on-going and new research on distribution and ecology of the Guadalupe fur seal. Encourage academic institutions to facilitate resource data collection.

II. Record all sitings of Guadalupe fur seals and develop a database to track numbers of individuals, time of year, and location.

4.5.2 Management for Other Special Status Species

Specific Concerns

- There are several species of special status vascular plants on state lists, CNPS lists, or that are island endemics for which SNI has suitable habitat or known occurrences.
- There is one beetle and three land snail special status terrestrial invertebrate species on SNI: the San Clemente Island coenonycha beetle, the San Nicolas Island snail, San Clemente Island snail, and San Clemente Island blunt-top snail.
- The Xantus's murrelet was listed as a federally threatened and endangered candidate species in 2004 (FR Vol. 69 No. 86).
- The Ashy Storm-petrel was originally proposed to be listed as a threatened and endangered species in 2004 and again in 2007 the USFWS published a 90-day petition finding (73 FR 28080) in May 2008 in which it concluded that the petition provided substantial information indicating that listing of the Ashy Storm-petrel may be warranted, and has initiated a status review.
- SNI has only two endemic terrestrial mammals, the San Nicolas Island fox and the San Nicolas Island deer mouse.
- The San Nicolas Island fox was listed under the ESA as a species of concern (59 FR 58982).
- There is uncertainty of the future existence of the non-essential experimental population status for the Southern sea otter population that exists south of Point Conception, California; the USFWS may designate this southern population as threatened in order to manage all California southern sea otters as one population with a similar listing status and concomitant rule and the listing may lead to impacts to military mission due to section 7 requirements.

Current Management

Although NBVC is not required to manage for species warranting Navy stewardship, the Navy recognizes the value of maintaining diverse ecosystems. The Navy also recognizes that it is prudent to protect rare species as a proactive strategy to prevent future Federal listings. To the extent that resources are available to support the management of these species, NBVC intends to implement the following objectives and strategies. Several of the protected species do not use terrestrial portions of the island and are only found offshore, in areas the Navy does not own or actively manage. The Navy complies with the laws pertaining to regulated species by avoiding and minimizing impacts to those species and their habitat.

Assessment of Current Management at SNI

The habitat based and species specific management measures proposed in this INRMP in conjunction with the NEPA Site Approval and Project Review Process provide a sufficient level of natural resource management to protect and conserve species warranting Navy stewardship at SNI.

Management Strategy

Objectives and Strategies for Flora and Fauna Warranting Navy Stewardship

Objective: Species warranting Navy consideration and the habitats which support those species, will be protected to the extent practicable by giving them consideration during the land use planning processes.

I. Provide for the recovery, enhancement, and protection of species warranting Navy stewardship, as a proactive strategy to prevent federal listings.

A. Maintain contact with regional specialists and regulatory agencies regarding the listing status of unique species known or thought to occur on SNI.

B. Continue to participate in the USFWS/NMFS review and listing process for species known or thought to occur on SNI that are being considered for listing under the ESA.

C. Stay updated on agency decisions, published material, and meetings that change the listing status of species.

D. To the extent practical, avoid or minimize impacts from military activities to species warranting Navy stewardship.

II. Continue to resolve baseline biological data gaps.

A. Support ongoing and new research on distribution and ecology of species warranting Navy stewardship. Encourage academic institutions to facilitate resource data collection.

B. Continue to inventory and map existing species warranting Navy stewardship.

4.5.2.1 Special Status Plants - State Endangered, State Threatened, State Rare, and CNPS Rare, Threatened, and Endangered

Specific Concerns

The relative distance of SNI from other landmasses has resulted in the development of reproductively isolated populations of unique plants. Flora that may warrant stewardship are those which fall into any one of the following categories:

- Federally listed
- State listed
- Proposed for federal listing or a former Category 2 or 3 species
- Are considered rare
- Are taxonomically undescribed
- Are an endemic species
- Are on the CNDDB lists
- Occur on CNPS Inventory of Rare Plants with a status of 1B or rarer
- Identified as being of scientific interest

There are no federally listed or proposed for federal listing plant species that are known to occur on SNI. However there are several species of vascular plants on state lists, CNPS lists, or that are island endemics for which SNI has suitable habitat or known occurrences. All plants that have a CNPS listing of 1B or rarer, which includes all state listed species here on SNI, are regarded as valuable natural resources. Measures to ensure their survival and healthy rebound should be considered when discussing management issues.

One of the most effective ways to preserve unique plant species is by assembling and evaluating the available information, and then utilizing that information during the land planning stages of projects and activities. By doing so, a list of specific concerns can be developed and from that a prioritized strategy approach can be created. Generally speaking, the current state of the special status plants that either are known to occur or have the potential to occur on SNI has yet to be identified. Beyond that, there are some environmental conditions that do not favor the recovery of certain species.

A list of specific concerns that if addressed would likely result in an increased knowledge base as well as suitable conditions for species survival is as follows:

- Navy operations and facility development and maintenance activities contribute to loss of suitable habitat.
- There are soil erosion conditions that are destructive to sensitive plant communities.
- There is uncertainty of pollinators for sensitive endemic plants.
- There is uncertainty of increased competition from invasive non-native species.

Current Management

The focus of current management has been a long-term, sustained investment in invasive plant control. Invasive plant control is prioritized by the potential of the plant species to spread, its proximity to sensitive species, and by current operations. A RCD Weed Eradication Plan was developed with the support of the USSCS and has been implemented at SNI. The Weed Eradication Plan supplements an alien plant removal plan developed by natural resource staff in the early 1990s. Task orders have been developed to implement the current Weed Eradication Plan by eradicating highly invasive non-native plant species. Initial non-native plant control treatments on SNI were carried out by Agri Chemical and Supply Inc. beginning in May 2001 and continue to date. This non-native plant control effort focused primarily on fennel and short-podded mustard, although several other target non-native species were treated in 2008, including: arundo, agave, cliff aster, smilo grass, and milk thistle (Agri Chemical and Supply Inc. 2009). BMPs have also been implemented to promote invasive plant control.

The current management of vegetation communities and special status plants is in compliance with the OPNAVINST 5090.1C plan for the conservation of natural resources. All plans for building and activities follow the established site approval and project review process developed for USDOD properties. The instruction specific to SNI in order to comply with NEPA is NBVCINST 11010.1 dated 04 June 2003.

■ **For more information on the vegetation monitoring program at SNI refer to *Section 3.4.6: Long-Term Monitoring of Plant Communities***

Sensitive plant surveys for special status plants were conducted by Steve Junak between 1999 and 2003; a total of 21 sensitive plant taxa were included in the study and sixteen of the study taxa were found (Junak 2003). The special status plants that have been identified for SNI are identified in Table 4-1. Sensitive plant taxa on SNI were also mapped during surveys conducted on the island in the early 1990s (Junak *et al.* 1995, 1996). These earlier surveys were conducted to support establishment of vegetation monitoring plots that were placed in representative plant communities on SNI and on other Channel Islands under the jurisdiction of the NPS in a joint effort. These plots are 30 m in length and were annually monitored from 1993-1996 (Junak *et al.* 1995, 1996), but were not resampled until 2009 (TDI 2009).

Assessment of Current Management at SNI

San Nicolas Island is able to accomplish stewardship of special status plant populations through the use of the NEPA Site Approval and Project Review Process in conjunction with construction BMPs. SNI is also able to assess the current status and trend of special status plant species through the vegetation monitoring program that utilizes established monitoring plots and sensitive plant surveys.

However, an issue that may be considered to improve the management of special status species and their populations that occur on SNI is that scarce resources are available for development of an Island herbarium.

Management Strategy

The habitat or ecosystem (rather than individual species) focus of this INRMP is expected to result in integrated recommendations which will serve to protect SNI and target communities as a whole. The key is to strike the acceptable balance between natural habitat values and SNI's military mission. Current constructive management efforts will be sustained while adopting more up to date research tools and adaptive management approaches. Initially this will greatly increase the amount of data specific to SNI. In doing so and continuing to do so valuable accurate datasets will assist in the development of resource conservation programs. Furthermore, systematic surveys will prove valuable in better understanding the island as a whole and how the military mission at SNI can be upheld.

Table 4-1. Special-status plants on San Nicolas Island (CNDDB 2009; Junak 2008).

Species Name	State Status	CNPS Status	SNI Endemic	Status on San Nicolas Island
San Nicolas Island buckwheat (*Eriogonum grande* var. *timorum*)	CE	1B	X	Common within coastal bluff scrub community; populations are stable or increasing and are not imminently threatened.
beach spectaclepod (*Dithyrea maritima*)	CT	1B		Uncommon within sand dunes and sandy slopes; expanding marine mammal (seal and sea lion) populations are effecting some populations of this plant.
Trask's locoweed (*Astragulus traskiae*)	CR	1B	X	Common within coastal bluff scrub and coastal dune plant communities; populations apparently stable and without imminent threats.
aphanisma (*Aphanisma blitoides*)	-	1B		Uncommon among clumps of Opuntia in coastal scrub community; threats unknown.
south coast saltscale (*Atriplex pacifica*)	-	1B		Uncommon in coastal scrub, coastal bluff scrub, and playas; threats unknown.
Trask's cryptantha (*Cryptantha traskiae*)	-	1B	X	Uncommon on bare windswept cliffs; threats unknown.
Palos Verdes live-forever (*Dudleya virens* ssp. *insularis*)	-	1B		Common in suitable rocky soil habitat in coastal bluff scrub and coastal scrub communities; threats unknown.
San Nicolas Island lomatium (*Lomatium insulare*)	-	1B	X	Uncommon on sandy slopes of lower sea terraces.
San Nicolas Island malacothrix (*Malacothrix foliosa* ssp. *polycephala*)		4.2	X	Widespread locations throughout much of island, especially on coastal flats between Corral Harbor and Sand Spit.

Objective and Strategies for Special Status Plant Species

Objective: Protect the natural diversity and long-term viability of the ecological and evolutionary processes in all natural communities and habitats consistent with USDOD ecosystem management policy (USDOD 1994), including no net loss in the capability of SNI lands to support its military mission.

I. Continue to support efforts to conduct an inventory of special status plants on SNI.

A. Support vegetation surveys that use the established vegetation monitoring plots.

1. Coordinate a terrestrial invasive non-native species assessment with re-occurring vegetation surveys.

II. Investigate habitat and reproductive requirements for sensitive endemic plants species that occur on SNI.

III. Conserve special status plant species habitats and populations.

A. Conserve habitat that has known species occurrences or has the potential based on habitat characteristics.

B. Support population specific programs that are specific to each special status plant species population that identifies threats and develops solutions based on the particular situations at hand.

IV. Perform erosion control efforts under their specific management plan.

V. Investigate the potential to restore natural habitat with rare plants whenever the environment it suitable (if necessary).

VI. Control invasive non-native species as detailed within their specific management plan.

4.5.2.2 Terrestrial Invertebrates - Federal Species of Concern and CNDDB Extremely Endangered

Specific Concerns

- There is one beetle and three land snail special status terrestrial invertebrate species on SNI: the San Clemente Island coenonycha beetle, the San Nicolas Island snail, San Clemente Island snail, and San Clemente Island blunt-top snail.
- The three snail species are highly restricted in range.
- The San Nicolas island snail is vulnerable to military activities or other actions which may result in the introduction of exotic species or cause erosion.
- The principal threat to the San Clemente island snail is habitat loss.

Current Management

Terrestrial invertebrates are formally managed from a habitat perspective through the utilization of the Site Approval and Project Review Process codified in NBVCINST 11010.1. Terrestrial invertebrates are also managed through informal interactions between the environmental staff and pest contractors that work on SNI. The environmental staff also looks out for new invertebrate arrivals during their daily routine while conducting fieldwork throughout the year.

Assessment of Current Management at SNI

A need currently exists to supplement current management activities with educational opportunities to provide pest management contractors with awareness of the threat of exotic invasive terrestrial invertebrates. A formalized educational program may enhance the capacity of the environmental staff to utilize the time that pest management contractors spend in the field in order to detect introductions of invasive exotic invertebrates into habitats on SNI. For more information regarding management of terrestrial exotic invasive species refer to *Section 4.6.1: Terrestrial Invasive Exotic Species*.

Management Strategy

Objectives and Strategies for Special Status Terrestrial Invertebrates

Objective: Protect special status native invertebrate species and develop measures to prevent the establishment and spread of exotic invasive invertebrates.

I. Determine baseline information on the special status native invertebrate species of SNI.

A. Consolidate existing information on documented special status species.

B. Support studies that focus on interactions between invertebrates and endemic fauna and flora.

1. Support completing baseline field surveys for insects, focusing on special status endemic invertebrate food resources such as endemic plants and surveys that focus on understanding which special status endemic invertebrates are utilized by endemic fauna.

4.5.2.3 Xantus's Murrelet - Federal ESA Candidate

Specific Concerns

- On SNI, Xantus's murrelets are perennial visitors in nearshore waters around the island but are not documented to nest or breed on the island or its offshore rocks.
- Threats to populations include predation, oil spill, and lack of available prey items.
- There is uncertainty if there is a sufficient monitoring program to observe the presence of Xantus's murrelet on SNI.
- There is uncertainty if current military uses harass Xantus's murrelet and reduce the probability that individuals will rest and breed on SNI.

Current Management

The Xantus's murrelets were listed as a federally threatened and endangered candidate species in 2004 (FR Vol. 69 No. 86). SNI's implementation of the SWPPP contributes to ensuring that non-point source storm water discharge does not impact the Xantus's murrelets population. ASBS water quality compliance also contributes to ensuring that impacts to water quality do not affect the Xantus's murrelets offshore foraging activities.

Regional seabird surveys have been conducted by USGS and NOAA over the past two decades to help understand the foraging ecology of murrelets. Harry Carter, of Carter Biological Consulting, has conducted seabird research at SNI, which includes the murrelets, since the 1990s. Harry Carter has also conducted a comprehensive survey of Xantus's murrelets from Baja California, Mexico to San Miguel Island in 2008.

Assessment of Current Management at SNI

The Navy supports seabird monitoring efforts through regional avian research partnerships. The Navy also records current sitings of this species at SNI and adjacent nearshore waters. The Navy continues to support efforts to identify and monitor population baseline levels and trends in their population.

Management Strategy

Objective and Strategies for Xantus's Murrelet

Objective: Support the monitoring of Xantus's murrelets populations at SNI.

I. Provide for the recovery, enhancement, and protection of Xantus's murrelets, as a proactive strategy to prevent federal listings.

A. Support seabird surveys indentifying species warranting Navy stewardship known or thought to occur on SNI.

B. Support survey of offshore rocks adjacent to SNI to confirm the presence/absence nesting habitat of Xantus's murrelets.

C. Stay updated on USFWS decisions, published material, and meetings that change the listing status of species.

D. To the extent practical, avoid or minimize impacts from military activities to Xantus's murrelets.

II. Continue to resolve baseline biological data gaps.

A. Support ongoing and new research on distribution and ecology of Xantus's murrelets. Encourage academic institutions to facilitate resource data collection.

B. Record all sitings of Xantus's murrelets and develop a database to track numbers of individuals, time of year, and location.

C. Survey intermittently offshore for foraging murrelets.

4.5.2.4 Ashy Storm-Petrel - Federal ESA Candidate

Specific Concerns

- Ashy storm-petrels have been confirmed to breed at 26 locations (on islands and offshore rocks) with breeding concentrated in two population centers at the Farallon Islands and in the California Channel Islands (Carter *et al.* 1992).
- On SNI, ashy storm-petrels are perennial visitors in nearshore waters around the island but are not documented to nest or breed on the island or its offshore rocks.
- Threats to populations include predation, oil spill, and lack of available prey items.
- There is uncertainty if there is a sufficient monitoring program to observe the presence of ashy storm-petrel on SNI.
- There is uncertainty if current military uses harass ashy storm-petrel and reduce the probability that individuals will rest and breed on SNI.

Current Management

Originally proposed to be listed as a threatened and endangered species in 2004 and again in 2007 the USFWS published a 90-day petition finding (73 FR 28080) in May 2008 in which it concluded that the petition provided substantial information indicating that listing of the ashy storm-petrel may be warranted, and initiated a status review. SNI's implementation of the SWPPP contributes to ensuring that non-point source storm water discharge does not impact the ashy storm-petrel population. ASBS water quality compliance also contributes to ensuring that impacts to water quality do not affect the ashy storm-petrel's offshore foraging activities.

Regional seabird surveys have been conducted by USGS and NOAA over the past two decades to help understand the foraging ecology of storm petrels. Harry Carter, of Carter Biological Consulting, has conducted seabird research at SNI, which includes the storm petrels, since the 1990s.

Assessment of Current Management at SNI

The Navy supports seabird monitoring efforts through regional avian research partnerships. The Navy also records current sitings of this species at SNI and adjacent nearshore waters. The Navy continues to support efforts to identify and monitor population baseline levels and trends in their population.

Management Strategy

Objective and Strategies for the Ashy Storm-Petrel

Objective: Support the monitoring of ashy storm-petrel populations at SNI.

I. Provide for the recovery, enhancement, and protection of ashy storm-petrels, as a proactive strategy to prevent federal listings.

A. Support seabird surveys indentifying species warranting Navy stewardship known or thought to occur on SNI.

B. Support survey of offshore rocks adjacent to SNI to confirm the presence/absence nesting habitat of ashy storm-petrels.

C. Stay updated on USFWS decisions, published material, and meetings that change the listing status of species.

D. To the extent practical, avoid or minimize impacts from military activities to ashy storm-petrels.

II. Continue to resolve baseline biological data gaps.

A. Support ongoing and new research on distribution and ecology of ashy storm-petrels. Encourage academic institutions to facilitate resource data collection.

B. Record all sitings of ashy storm-petrels and develop a database to track numbers of individuals, time of year, and location.

4.5.2.5 San Nicolas Island Fox - State Threatened

Specific Concerns

- The island fox, which includes all six subspecies on all six islands, was listed under the CESA as a state threatened species on 27 June 1971.
- A Recovery Strategy for island foxes on the northern Channel Islands was published by the CINP in August 2003.
- The San Miguel Island fox (*Urocyon littoralis littoralis*), Santa Rosa Island fox (*Urocyon littoralis santarosa*), Santa Cruz Island fox (*Urocyon littoralis santacruzae*), and Santa Catalina Island fox (*Urocyon littoralis catalinae*) were all included in a final rule that listed them as federally endangered species under the ESA on 05 March 2004 (69 FR 10335).
- The San Nicolas Island fox was listed under the ESA as a species of concern (59 FR 58982).

Current Management

Management of the San Nicolas Island fox population consists primarily of maintaining current population levels through protection of habitat, and reduction of human caused impacts. Habitat protection on SNI is accomplished through implementation of the Site Approval and Project Review Process codified in NBVCINST 11010.1.

The Navy supports annual mark/recapture surveys for Island foxes at SNI. The current status of the San Nicolas Island fox population in 2010 is over 500 individuals.

The San Nicolas Island fox population is affected both by competition with feral cats, and the acts of human beings. A feral cat removal program was conducted from 2009-2010 and has removed most of the feral cats from SNI.

■ **For more information on feral cats at SNI refer to *Section 4.6.1: Terrestrial Invasive Exotic Species.***

At this time there are no conservation plans designed specifically for the management of the San Nicolas Island fox population; however, a Draft Candidate Conservation Agreement has been submitted to the USFWS and may need further review before it is implemented. Navy biologists at SNI do follow the Channel Islands Fox Recovery Team guidelines by implementing a vaccination and disease control program that focuses on canine distemper and rabies.

Assessment of Current Management at SNI

Management and monitoring of the San Nicolas Island fox is sufficient. If a sudden disease outbreak were to occur, the annual monitoring program and intermittent transects will capture any sudden decline or change in the abundance of the population. The Navy will continue to minimize vehicle mortality collisions by enforcing speed limits and conducting roadside maintenance activities.

Management of the San Nicolas Island fox will continue to benefit from efforts to develop a Draft Candidate Conservation Agreement (CCA) between the Navy and the USFWS for the Island fox. Implementation of such an agreement would formalize education, monitoring, necropsy, and management. There also exists a need to have adequate management capacity to detect early and respond quickly to future threats to mammal populations such as an incident of disease outbreak. If such an incident were to occur there is a need to discover mortality events early. Questions remain as to the efficacy of using remote monitoring technology to be able to monitor a mortality event in order to prevent a wildlife disease incident to occur in SNI fox population. Management will continue to follow the Channel Islands Fox Recovery Team guidelines by implementing a vaccination and disease control program that focuses on distemper and rabies.

Management Strategy

Objectives and Strategies for San Nicolas Island Fox

Objective: Maintain a viable population of the San Nicolas Island fox by reducing human impacts.

I. Maintain a viable population of the San Nicolas Island fox.

A. Continue to monitor and study fox demographics and ecology through annual fox monitoring to determine population, age structure, and density.

1. Determine current levels of reproductive success, disease, and causes of mortality.

B. Develop a CCA with the USFWS that outlines implementable conservation measures to decrease the number of foxes killed by vehicles, to increase the visibility of foxes on roadsides, and to increase our knowledge of the distribution of island foxes in relation to various vegetation communities.

C. Continue prohibition of domestic dogs on SNI to protect foxes against transfer of infectious canine diseases.

D. Continue implementing invasive non-native monitoring, control, and removal programs.

E. Ensure that pest management practices minimize harm to island fox and deer mouse populations. Continue to restrict the use of rodenticides to avoid secondary poisoning of foxes and discourage habitation of buildings by mice through appropriate measures.

F. If specific locations are known to be used by trespassers that may bring dogs ashore, post signs in these locations stating that trespass is illegal and that the presence of dogs can threaten sensitive wildlife.

II. Reduce negative, human-caused impacts to foxes.

A. Maintain island speed limit at 35 mph or less.

B. Adapt roadside mowing to increase visibility of foxes to drivers.

C. Maintain roadside signs warning of foxes.

D. Maintain fox exclusion devices at food waste disposal sites.

E. Continue education of island personnel to fox issues and their role in helping to preserve the species.

III. Remain an active participant with other agencies regarding island fox issues.

A. Maintain contact with regional specialists and regulatory agencies to stay updated on the listing status of the Island fox.

4.5.2.6 San Nicolas Island Deer Mouse - State Sensitive

Specific Concerns

- The status of the San Nicolas Island deer mouse population is unknown at this time.
- A routine monitoring program that assesses the current status of the San Nicolas Island deer mouse population does not exist.

Current Management

The San Nicolas deer mouse population varies based on seasonal weather patterns affecting vegetation and predation by wildlife. The status of the population is unknown but is thought to oscillate based on rainfall. The management of the SNI deer mouse is primarily accomplished through vegetation habitat management and minimizing human caused impacts through utilization of the Site Approval and Project Review Process codified in NBVCINST 11010.1.

The pest management and control program at SNI also contributes to endemic terrestrial mammal management by restricting the use of poison rodenticide bait for rodent control. Prohibiting domesticated dogs from accessing the Island also contributes to mammal management by avoiding harassment to endemic mammals and controlling a potential vector for wildlife disease.

Intermittent surveys have been conducted to assess the status of the San Nicolas Island deer mouse population by utilizing deer mice monitoring grids. Previous university studies have also been conducted to study the San Nicolas Island deer mouse.

Assessment of Current Management at SNI

There is a need to standardize a small mammal monitoring program at SNI. A standardized monitoring program ideally will conduct surveys either in the spring and/or fall. There is also a need to analyze, synthesize, and report on all the San Nicolas Island deer mouse studies that have been conducted at SNI.

Management Strategy

Objectives and Strategies for San Nicolas Island Deer Mouse

Objective: Determine the status of deer mouse populations.

I. Determine the status of deer mouse populations.

- *A.* Establish and implement a monitoring program to evaluate population status and overall health.
- *B.* Survey various vegetation cover types to investigate habitat associations to better provide better management information.
- *C.* Establish a data base to store current and historical data series and survey information.

II. Conserve and protect deer mouse habitat.

- *A.* Continue to monitor for non native species that could compete with deer mice (house mouse).
- *B.* Remove non native predators (feral cats).
- *C.* Use rodent control devices in structures and not rodenticides.

III. Remain an active participant with other agencies regarding deer mouse issues.

4.5.2.7 Southern Sea Otter - Federal ESA Non-Essential Experimental Population

Specific Concerns

- There is uncertainty of the future existence of the non-essential experimental population status for the southern sea otter population that exists south of Point Conception, California; the USFWS may designate this southern population as threatened in order to manage all California southern sea otters as one population with a similar listing status and concomitant rules.

- There is uncertainty if a change in the status of the Southern sea otter population at SNI may affect island military uses and natural resource management activities.

Current Management

The Secretary of the Interior determined on 14 January 1977 (42 FR 2968) that the southern sea otter was a threatened species for the purposes of the ESA. On 15 August 1986 (51 FR 29384) the USFWS proposed the establishment of an experimental population of Southern sea otters. This experimental population represents a different population than that designated as threatened under the ESA. In August 1987, the USFWS developed a final rule to establish this experimental population and began translocating this population of southern sea otters to SNI in the SCB as part of the recovery action for these animals (Riedman and Estes 1990; USFWS 2003a). On 27 September 1988 (53 FR 37577) the USFWS published technical amendments to the sea otter translocation regulations as a final rule.

The last sea otter in the experimental population was released at SNI in July 1990, for a total of 140 sea otters (USFWS 2003a). Of the 140 sea otters released, the fate of 70 is known. At least 13 sea otters are thought to have remained at San Nicolas Island after their release (USFWS 2003a). The number of otters at SNI as of January 2002 was approximately 27 individuals (USFWS 2003a).

Assessment of Current Management at SNI

Marine mammal monitoring activities are generally related to the surveys used to support compliance with the NMFS LOA for sea lions, elephant seals and harbor seals. The installation continues to support efforts by USFWS to assess the resident experimental population of Southern sea otters at SNI and facilitate research and adaptive management strategies. Nearshore habitat management and compliance with ASBS conservation measures may be sufficient to protect and maintain Southern sea otter populations at SNI.

Management Strategy

Objective and Strategy for the Southern Sea Otter

Objective: Resolve baseline biological data gaps for the southern sea otter population at San Nicolas Island.

I. Support on-going and new research on distribution and ecology of the southern sea otter at SNI. Encourage academic institutions to facilitate resource data collection.

II. Record all sitings of southern sea otters at SNI and develop a database to track numbers of individuals, time of year, and location.

4.6 Invasive Exotic Species

Regional Concerns

- Invasive exotic species are one of the leading causes of degraded ecological condition and ecosystem services (NISC 2001); climate change has the potential to interact with this stressor through multiple mechanisms (Fischlin *et al.* 2007; NISC 2008; EPA 2008).
- Experience elsewhere shows that ignoring an invasive exotic species often leads to a crisis situation where the species can no longer be eradicated and actions to limit the population become very expensive, if not impossible (Cohen and Carlton 1998).
- Exotic species invasion poses one of the most serious threats to the integrity of SNI's ecosystem, and the rate of local introduction is probably increasing, as has been shown on the nearby mainland coast (Crooks 1998).

- Very little is known about the vast majority of invading exotic species and their effects on the SNI ecosystem.

Current Management

A weed eradication plan for the island was developed by the environmental staff at SNI (Agri Chemical and Supply Inc. 2009). Task orders have been developed to implement that plan by eradicating highly invasive non-native plant species. Initial non-native plant control treatments on SNI were carried out by Agri Chemical and Supply Inc. beginning in May 2001. This non-native plant control effort focused primarily on fennel and short-podded mustard, although several other target non-native species were treated in 2008, including: arundo, agave, cliff aster, smilo grass, and milk thistle (Agri Chemical and Supply Inc. 2009). Beginning in 2010, Sahara mustard was also mapped and treated (V. Vartanian, *pers. comm.*, 2010).

USDOD Management

U.S. Department of Defense management of invasive non-native species is guided by EO 13112 (03 February 1999).

■ **See Appendix B, *Section B.1: Federal Laws* for more information.**

Assessment of Current USDOD Management

As an island ecosystem, SNI is particularly vulnerable to the introduction of invasive non-native (e.g. exotic) species. Plants and animals which evolved in other locations may have ecological advantages over native species which evolved without the presence of certain pathogens/parasites endemic to a species or without levels of competition and predation present elsewhere. If conditions are hospitable, newly introduced species can become established and out compete native species. The intensity of the interaction between native and exotic species could change with anticipated effects from global climate change such as changes to warming and drying scenarios in Mediterranean type ecosystems like that present at SNI. Warming and drying trends are likely to induce substantial species-range shifts, and imply a need for migration rates that will exceed the capacity of many endemic species (Fischlin *et al.* 2007). Vegetation structural change driven by dominant, common or invasive species may also threaten rare species (Fischlin *et al.* 2007). There is a difference between the potential for natural colonization of habitats that have undergone structural change due to global environmental change and colonization by invasive non-native species that results from human induced disturbance in the terrestrial or aquatic environment.

Management of invasive non-native species nationwide is focusing on those non-native species presently having obvious negative effects on native species populations. Studies of invasive non-native species have revealed that observed effects may range from "relatively large spatial (habitat-wide) and temporal-scale (decades) to small-scale interactions that take place in a matter of weeks" (Crooks 1998; Reusch and Williams 1998). To be effective, management actions need to understand non-native invasions in the context of the existing and historical natural systems. Some invasive non-native species have taken decades since introduction to become a "pest," showing that it is "potentially dangerous" to predict the future status of a non-native invader from its current status (Crooks 1998). Timing is of the essence, since delays in implementing appropriate control or extirpation measures can cause the measures to be ineffective if the invading non-native population grows too large.

Maintaining quality habitat should also help prevent or minimize invasions of non-native species. Anthropogenically disturbed sites, even when disturbed temporarily for restoration purposes, show an increased number of invasive non-native species (Crooks 1998). Altered hydrologic, soil, and fire regimes can also contribute to non-native plant germination and establishment.

Once invasive exotic species are established, at least five types of management controls can be used: (1) mechanical (through physical removal), (2) chemical (through conventional pesticides), (3) biological (through introduction of known natural predator or parasite), (4) harvest management (through promotion of a sport or commercial fishery for aquatic invaders) and (5) fire for terrestrial invaders. Biological controls are still in the experimental stage but hold promise. Each type has associated advantages

and disadvantages, and combinations of more than one can be applied. Through adaptive management, managers can learn from experience to help identify the best tools for control of invasive non-native species. Targeting control of the most invasive, potentially ecosystem-damaging species in a timely fashion should also be a high priority because not all non-native species create serious problems.

4.6.1 Terrestrial Invasive Exotic Species

Specific Concerns

- Regional concerns for terrestrial invasive exotic species management on SNI include but are not limited to invasive terrestrial plants, invasive terrestrial invertebrates, invasive terrestrial birds, and invasive terrestrial mammals.
- Established populations of invasive exotic terrestrial plants are present in SNI, which include fennel, short-podded mustard, Sahara mustard, arundo, cliff aster, smilo grass, and milk thistle.
- Invasive exotic terrestrial invertebrate species that pose a potential threat to the integrity of SNI's terrestrial ecosystem include but are not limited to the argentine ant, the European garden snail and the predatory decollate snail.
- Invasive exotic birds at SNI include but are not limited to chukar and European starlings.
- Established populations of chukar are present on SNI; although used for hunting on the mainland there is no hunting permitted on SNI so it may be considered an invasive bird species rather than a game species.
- Introduced terrestrial mammals pose a serious risk to the integrity of various avian, reptile, and mammal species. Feral cats compete with the state threatened San Nicolas Island fox for food and habitat.
- Future introductions of exotic terrestrial mammals such as rats may impact and compete with endemic mammals.

Current Management

Executive Order 13112 requires federal agencies to prevent the introduction of invasive non-native species and provide for their control (USDON 2005a). Implementation of EO 13112 is covered by NISC's 2008-2012 NISMP. Management objectives and strategies in this INRMP build upon the framework discussed in the 2008-2012 NISMP. In addition to EO 13112, the Federal Noxious Weed Act (7 USC § 2801 *et seq.*) explicitly provides for the control and eradication of noxious (e.g. invasive) plants and weeds on land under the control of the federal government.

Pesticide use in natural resources management programs must also comply with applicable requirements of Chapter 13 of OPNAVINST 5090.1C (USDON 2007). Such programs must also allow for the conservation of federal and state listed plants and promote their delisting by maintaining or enhancing the ecosystem they depend upon. The control and eradication of non-native species, especially invasives, is of primary importance to natural resources management on SNI and is a fundamental step toward conservation of island ecosystems.

Exotic invasive species control for terrestrial flora is currently addressed under a weed eradication plan that was developed by the environmental staff at SNI (Agri Chemical and Supply Inc. 2009). Annual risk assessments are developed by island staff familiar with invasive non-native plant species. Non-native plant control treatments on SNI were carried out by Agri Chemical through individual task orders and have been performed somewhat regularly since 2001. This invasive non-native plant control effort provides a continuous effort that identifies the status and trend of the most aggressive and threatening invasive non-native plants while supporting a mechanism for identifying new introductions. A revised weed eradication plan needs to be developed and adopted in a more strategic manner.

SNI does not have a current IPMP. Actions are being taken to modify the IPMP for Point Mugu and Port Hueneme to include SNI in that plan's footprint. A future IPMP that addresses SNI may include management strategies to address invasive non-native terrestrial invertebrates.

Management for the control and removal of non native terrestrial mammals on SNI was identified as a recommended management action in the 2006-2010 SNI INRMP for the protection and restoration of seabirds and other native wildlife on SNI and was endorsed by the Trustee Council for the Montrose Settlements Restoration Program (MSRP) (USFWS 2009). The Trustee Council for the MSRP selected the restoration of seabirds on SNI through the complete removal of feral cats as a priority project in their MSRP Final Restoration Plan. Implementation of the feral cat control and removal program was accomplished from 2009-2010. A majority of the feral cats at SNI have been removed as a result of that program. Monitoring for feral cats using remote video and trapping at SNI continues to remain a priority management action. If additional feral cats are detected, trapping may again be required. Any feral cat trapping efforts would follow the same protocols described in the environmental assessment for the seabird restoration project (USFWS 2009), as well as other protocols and methods that were later incorporated into the project to reduce potential impacts to sensitive species. If non-native animal trapping occurs in the future, targeting feral animals such as cats, the Navy will coordinate with CDFG (South Coast Region) and USFWS to determine and discuss any appropriate measures to reduce any adverse impacts to island foxes.

Management of invasive exotic species is also accomplished through implementation of the NEPA Site Approval and Project Review Process codified in NBVCINST 11010.1.

Assessment of Current Management at SNI

Terrestrial invasive exotic species management efforts need to be more strategic. Currently, all five strategic goals identified in the 2008-2012 NISMP are being implemented at SNI; however, a better job can be done at implementing all of those goals, especially for prevention efforts. If more funding is available to support implementation of these five goals then more results will be evident. There is a need to develop and enforce bio-security measures for SNI. These bio-security measures will help implement the goal of preventing new introductions of invasive non-native species. If more resources can be directed towards the implementation of prevention measures, in the long term financial resources will be saved to implement measures that support the other four remaining goals. Prevention is the primary line of defense to avoid or minimize impacts from invasive non-native species introductions. If an invasive non-native species is introduced and becomes established the second line of defense is control and management. This prioritization approach should be reflected in the amount of resources being requested to support invasive non-native species management at SNI.

There is also a need to evaluate the contributions of invasive non-native species to sensitive native species. For example, studies of chukar competition with San Nicolas Island fox populations showed that its impacts are negligible; the chuckar is not competing with local species. However, as a result of the feral cat removal project, one of the predators to chukars has been reduced in numbers. An EPR has been developed that will consider post-cat removal monitoring to include birds and most likely chukar. Coordination with USFWS and CDFG may also be accomplished to assist in the removal of chukar from SNI because of their large abundance there.

Management Strategy

Objectives and Strategies for Terrestrial Invasive Exotic Species

- **For more information on landscaping and grounds maintenance refer to *Section 5.14: Landscaping and Grounds Maintenance*.**

Objective: Minimize introduction of invasive non-native terrestrial species to San Nicolas Island through prevention.

I. Prepare and implement a bio-security plan to prevent non-natives from entering SNI.

A. Enforce requirement that vehicles and equipment be cleaned prior to shipment to the island, and between uses at different island construction sites.

B. Gravel and fill materials are brought to the island, then documentation is required to certify that it is “weed free.” Inspections of the material will be conducted to verify this requirement.

C. Require that native plant species be used for landscaping unless a species is specifically approved by ED.

D. Inspect barge and aircraft before they leave the mainland. For transport arriving directly from other ports or airports, inspect prior to disembarking on SNI.

II. Prepare educational materials for the SNI military and civilian employees, contractors, and other visitors to prevent the introduction of non-native terrestrial species.

Objective: Enhance current early detection and rapid response management capabilities.

III. Ensure bio-security plan establishes early detection protocol and rapid response options.

A. Establish adequate monitoring locations to detect invasive species introduction and spread.

B. Develop a communication network as a rapid response tool to quarantine specific invaders and identify the pathway.

C. Support rapid response by determining funding sources, contract vehicles, and cooperative mechanisms that can be accessed quickly.

D. Prepare Instructions that includes measures to prevent the introduction of invasive non-native species, detect early and respond rapidly to new introductions, and control and monitor established populations.

IV. Prepare educational materials for the SNI military and civilian employees, contractors, and other visitors as a tool in early detection of non-native terrestrial species.

Objective: Evaluate control and management capabilities for established invasive non-native species populations and identify strategic gaps.

V. Revise and implement an invasive plant management plan based on current needs, information, and priorities.

VI. Increase detection rates and management efficacy by monitoring the presence and absence of invasive non-native species populations.

VII. Map and prioritize terrestrial invasive non-native species populations.

A. Map the distribution of invasive species every five years.

VIII. Support studies that determine if there are impacts from invasive non-native species already present such as non-native snails, alligator lizards, and chuckar.

IX. Investigate and implement methods to control invasive non-native invertebrate species found on SNI.

A. Research control methods for argentine ant and decollete snails.

B. Determine the distribution of argentine ants on SNI.

C. Determine the distribution of decollete snails on SNI.

D. Prevent the spread of decollete snails by restricting use of SNI Native Plant Nursery stock to landscaping projects in the living compound.

X. Address non-native species in NEPA and other ground disturbing project plans.

A. Ensure funding is secured for non-native removal during all phases (including post-project), if applicable.

B. Monitor projects to ensure personnel are following BMPs, conservation measures, and other guidelines and requirements.

XI. Manage roads, access routes, and new construction sites to minimize the spread of invasive non-native species and insure that new road or access routes are not created without authorization and project review approval.

A. Develop and implement Island Long-Term Road Maintenance Plan.

B. Require that maintenance or repair of existing roads stay within established footprints.

C. Clean roadside mowing equipment of adhering dirt and vegetation between mowing cycles.

D. Schedule roadside mowing to minimize weedy species seed distribution.

XII. Make project proponents pay for restoration projects that are used to compensate for development of habitat.

XIII. Check project to make sure personnel are following guidelines.

Objective: Apply adaptive management principles and continue to evaluate the necessity for removal of other species.

XIV. Continue investigating the best methods for removal, control, and timing of removal of invasive nonnative plants and ensure compliance with applicable regulations governing removal.

XV. Complete the removal of the feral cat population on SNI. Assess and monitor the progress and success of the removal of feral cats.

A. Survey and inventory the current status of species known to be impacted by feral cats to properly assess the recovery of those species upon the completion of the project.

XVI. Prepare an Instruction to support an adaptive management approach for terrestrial invasive exotic species management.

Objective: Promote cooperative interagency efforts to collect and analyze comprehensive monitoring data, including shared funding and staffing.

XVII. Support the integration of SNI into the Invasive Species Task Force on Santa Cruz Island and other Channel Islands as opportunities arise.

4.6.2 Aquatic Invasive Species

Specific Concerns

- Aquatic invasive species are increasingly coming under the purview of regulatory and resource agency scrutiny, including ballast water and NPDES permits, total maximum daily loads (TMDLs) and impaired waters, economic consequences, and pesticide usage for control.
- Aquatic invasive species are used as biological indicators to measure ecosystem condition.
- Aquatic invasive species management in the context of climatic change requires increasing feedback to management in order to develop strategies for adapting their management to accommodate these environmental changes.

- Ability to monitor population densities of invasive non-native species to understanding any changes that take place in whole communities. Since impact assessments require thorough knowledge of the natural processes that influence community structure, further investigations into the relationship between hydrodynamics and resident fish and invertebrate assemblages may be central to the proper management of a healthy ecosystem.
- Specific vectors of aquatic invasive non-native species for SNI have not been identified; however, ballast water exchange from the provisioning barge may represent a potential vector to be cognizant of.
- Uncontrollable vectors for aquatic invasive species introductions to SNI include the provisioning barge, planes, tall ship congregation, security vessels, commercial and recreational fishermen, and dogs that are brought onshore.
- Specific harm to native species and the ecosystem has not been identified for the invasive non-native species that occur in SNI waters.
- Killer algae (*Caulerpa taxifolia*) is not known from SNI waters but, given its growth capability, it can have devastating ecological and economic consequences. It will kill all marine life in its path if it becomes established, as it did in Agua Hedionda Lagoon in Carlsbad, California in 1999. In the late 1970s, this species became popular among saltwater aquarium enthusiasts for its growth and brilliant green fern-like fronds. Around 1984 it was inadvertently introduced into the Mediterranean Sea where it spread rapidly. As in the Mediterranean, the introductions into California waters were probably from aquarium water illegally emptied into or near a storm drain, creek, lagoon, bay, or the ocean. It spreads mainly by fragmentation and can be transported by boats and fishing gear. If this species were to become established off the California shore, it could seriously impact commercial fisheries by altering fish distribution and creating considerable impediment to net fisheries. Navigation could also be affected through quarantine restrictions intended to prevent the spread of the species.
- Observations of Japanese seaweed (*Undaria pinnatifida*) in waters of Santa Catalina Island and Port Hueneme, and attached to floats in Santa Barbara Harbor have alarmed marine biologists in southern California. Japanese seaweed is regarded as a highly invasive pest to other marine communities because of its rapid growth and ability to displace native species. A native seaweed of the Japan Sea and northwest Pacific coasts of Korea and Japan, this commercially valuable plant is often harvested and consumed as a food plant in many Asian countries and France. It is commonly believed that the Japanese seaweed was initially introduced to Europe in the early 1970s through the import of Pacific oysters (*Crassostrea gigas*). The plant was later intentionally cultivated as a food source in the early 1980's. Scientists now believe Japanese seaweed is being introduced by attaching itself to ship hulls and aquaculture equipment (cages, ropes, floats, etc.), and on the anchors and nets of commercial fishermen.

Current Management

■ **For more information on federal aquatic invasive species laws see Appendix B, *Section B.1: Federal Laws*.**

The USDOD supports implementation of federal aquatic invasive species laws including but not limited to EO 13112, the National Invasive Species Act (NISA) of 1996, and the Nonindigenous Aquatic Nuisance Prevention and Control Act (NANCPA) of 1990.

NBVC supports CDFG as the lead agency for managing aquatic invasive species that occur in the nearshore waters of SNI and would collaborate with the CDFG Habitat Conservation Branch and the state invasive species coordinator. The CDFG conducts a number of programs related to aquatic invasive species, including serving as the lead agency in developing the statewide aquatic invasive species management plan, as well as a rapid response plan for invasions. The CDFG is responsible for enforcement of regulations concerning the aquaculture industry; recreational fishing; commercial fishing; the importation and transport of live wild animals, aquatic plants and fish into the state; and the placement of any such animals in state waters. Recent programs have focused on the aquarium plant *Caulerpa taxifolia*, the voracious fish northern pike, and the New Zealand mudsnail, among others. All species of *Caulerpa* are regulated in the state of California under CDFG Division 3, Chapter 3.5 Section 2300. Other state

authorities and agencies with regulatory authority over the introduction and transport of aquatic invasive species include the California Department of Food and Agriculture through the California Food and Agriculture Code, California Department of Water Resources through the California Water Code, and the State Lands Commission through the Ballast Water Management Act and Marine Invasive Species Act of 2003.

Furthermore, NVBC is acting in compliance with EO 13112 by incorporating invasive non-native species prevention measures through contract language, BMPs, as well as existing operational and transportation policies and pest management plans.

In OPNAVINST 5090.1C, Navy installations are directed to prevent the introduction of invasive non-native species and provide for their control:

> "The Navy will identify actions that affect the introduction of invasive species, prevent their introduction, respond rapidly to their control, monitor populations, restore affected native species and their habitat, conduct research and develop technologies to prevent further introductions, and promote public education of the issue. The Navy will not authorize, fund, or implement actions that are likely to cause or promote the introduction or spread of invasive species in the U.S. or abroad. Proper ecosystem management requires the control of noxious weeds, aquatic nuisance species, and other invasive species. Use of native plants in landscaping, grounds maintenance, and land restoration projects is required. Installation natural resources managers shall ensure that invasive species prevention recommendations are incorporated into new construction programs and operations. Land or ecosystem restoration projects shall require the use of native species only. Natural resources managers shall monitor invasive species populations and identify areas where research and new technology may be needed to better control invasive species in the military environment."

NBVC also prevents the introduction of aquatic invasive species by examining cargo, in-water construction materials, and amphibious training vehicles. Specifically OPNAVINST 5090.1C requires that amphibious vessels launching and recovering amphibious vehicles must ensure those vehicles, including their treads, are washed down after completion of operations. Ships shall also dispose of wash water before entering within 12 nm (22 km) of the next operating area.

Assessment of Current Management at SNI

Aquatic invasive species management efforts need to be more strategic. Currently, four of the five strategic goals identified in the 2008-2012 NISMP are being implemented at SNI: prevention, early detection and rapid response, control and management, and organizational collaboration. The role and responsibility of the Navy for aquatic invasive species management at SNI largely focuses on prevention and early detection and rapid response because the CDFG is the lead agency responsible for managing the nearshore waters surrounding SNI. It is the role and responsibility of the CDFG to control and manage any aquatic invasive species that are identified in the nearshore waters at the installation.

Aquatic invasive species prevention measures are guided by implementation of the NEPA Site Approval and Project Review Process codified in NBVCINST 11010.1 and BMPs for in-water construction projects.

■ **For more information on construction BMPs refer to *Section 5.2: Construction and Facility Maintenance*.**

Early detection and rapid response efforts at SNI occur through the following mechanisms: ASBS compliance biological surveys, surveys to document existing conditions for in-water construction projects, and surveys to document Special Aquatic Sites such as eelgrass habitat.

Management Strategy

Objective and Strategies for Aquatic Invasive Species

Objective: Prevent and manage invasive non-native invasions to minimize harmful ecological, economic, and human health impacts of aquatic invasive species in SNI waters.

I. Prevent the introduction of invasive non-native marine and coastal species into California waters.

A. Promote ballast water management for all vessels entering Naval Installations.

1. Support the continuation of the Navy's ballast water exchange policy for open ocean exchange and encourage the implementation of a ballast water management program that explicitly addresses the nonindigenous invasive species problem.

B. Identify methods to reduce or prevent the number of new invasive species.

II. Develop a standardized monitoring system focused on early detection and rapid response for high priority aquatic invasive species.

A. Provide for an early warning system for newly discovered species.

1. Target locations with higher probability for newly arrived species (e.g. barge loading area settings and disturbed sites).

2. Involve and educate Navy divers and marine scientists – who are frequently in the water and working on boats – in detection and management.

a. Develop a watch list for use by personnel who are frequently in the water that includes pictures to support the detection and management of aquatic invasive species.

b. Develop a means to educate personnel about the common aquatic invasive species pathways/vectors including barges, boats, and the recreational use of beaches.

B. Track all current monitoring of the state's coastal marine and inland waters for opportunities to incorporate early detection of aquatic invasive species. High priority aquatic invasive species for early detection for introduction or change in status include the zebra mussel (*Dreissena polymorpha*), Northern Pacific seastar (*Asterias amurensi*), snakehead (*Channa argus*), *Caulerpa, Hydrilla, Salvinia*, and others.

1. Map the existing problem areas and determine priority sites and control measures.

2. Monitor progress, evaluate the effectiveness of measures, and revise as needed.

C. Develop species- and/or location-specific rapid response plans in collaboration with CDFG and CDFA. These plans should include lead agencies, chain of command, specified lists of appropriate control measures (biological, chemical, and physical), methods to address the introduction pathways, and regular updates and drills to ensure the contingency plans remain current.

III. To control new invasive non-native species with the potential to become problems, provide a rapid response, and respond at the appropriate spatial scale.

IV. Promote cooperative interagency efforts to collect and analyze comprehensive monitoring data, including shared funding and staffing.

4.7 Prevention and Control of Wildlife Damage

4.7.1 BASH Program

Specific Concerns

- A BASH Plan has not been developed for SNI.

Current Management

Bird/Wildlife Aircraft Strike Hazard is defined as the threat of aircraft collision with birds during flight operations, particularly during take-off and landing and low-altitude training exercises. In general, the times of greatest threat during migratory bird activity are March, April, and August through November. While a safety hazard at SNI, bird-strikes occur infrequently.

BASH plans are required by USDOD for military installations where there is a potential for a conflict between military activity and wildlife. Usually BASH plans contain installation specific guidelines to minimize collisions between aircraft and birds, such as ducks, geese, and raptors.

Generally such a plan requires the training of a staff biologist and review of the plan by the U.S. Air Force.

The BASH plan for SNI has had a focus on non-native birds such as removal of chukar and the trapping of starlings. To reduce the attractiveness of areas near the airfield for use as cover the environmental program has been managing grass height through mowing. Surveys have also been conducted around the airfield; horned larks have been commonly found during these surveys.

Efforts have been made to revise the BASH plan for SNI. The environmental program will continue to manage for BASH and take into account impacts on native species.

Assessment of Current Management at SNI

The BASH requirement for SNI has not been met. There is a need to develop a formalized BASH plan for SNI. Any BASH Plan that will be developed will also be a component of a BASH Plan for NBVC Point Mugu.

Management Strategy

Objectives and Strategies for BASH and Wildlife Hazard Assessment

Objective: Reduce the potential for bird and other animal collisions with aircraft at the SNI airfield.

I. Develop and implement a Wildlife Hazard Assessment Bird Aircraft Strike Hazard Plan.

II. Monitor and document bird strikes and carcasses adjacent to SNI airfield.

III. Survey and monitor avian species utilizing the SNI airfield for foraging and roosting and document responses to aircraft to evaluate the potential for aircraft impacts.

■ **For more information regarding Migratory Bird Management refer to Section 4.4.3 Birds.**

4.7.2 Pest/Predator Control

Specific Concerns

- Pest species known to occur on SNI include house sparrows and the occasional rock pigeon (*Columba livia*).
- Other known vertebrates introduced to SNI in the last 10 years include the Virginia opossum (*Didelphis virginiana*), California ground squirrel (*Spermophilus beecheyi*), and dusky-footed wood rat (*Neotoma fuscipes*), but all have been successfully removed.

Current Management

San Nicolas Island does not have a current Integrated Pest Management Plan (IPMP). For the purposes of this INRMP, a pest is defined as a domestic plant or animal (including insects) usually found in the urban (built) environment that if it escapes causes harm to humans or native ecosystems (V. Vartanian, *pers. comm.*, 2010). Actions are being taken to modify the IPMP for Point Mugu and Port Hueneme to include SNI in that plan's footprint. The installation should complete a Bio-Security Plan which is currently under development at the time of writing.

Pest control on SNI is primarily concerned with the control or elimination of established pests and prevention of new pest species (invertebrates and vertebrates) introductions. All pests and predators on SNI in need of management actions were caught and removed by Environmental personnel. Snap traps are a commonly used method to capture pests in urban areas such as Nicktown.

Assessment of Current Management at SNI

There is a need to control and actively manage pests and predators at SNI.

Management Strategy

Objectives and Strategies for Pest and Predator Control

Objective: Prevent the introduction of pests to the island.

I. Minimize, to the greatest practical extent, the introduction of pest species to SNI.

A. Continue the prohibition on bringing pets to the island.

B. Require all barge and air cargo shipments (both contractor and government) be inspected for vertebrate and invertebrate species before departing port or airfield for SNI.

C. Establish an enforcement protocol for barge and air cargo shipment inspections.

D. Require gravel and soils be free of invertebrates.

E. Require refuse and shipping bins be inspected before transportation to SNI.

Objective: Control pests around facilities while avoiding and minimizing impacts to non-target individuals.

II. Develop a rodent control/removal plan and implement.

III. Determine presence or absence on non-native rodents.

A. Conduct a comprehensive island survey for rats and house mice.

B. Establish permanent rat monitoring stations in areas of likely invasion.

IV. Develop pest control plan using IPMP guidelines for level of control based for the pest problems appropriate level of control.

4.7.3 Game Species Management

Specific Concerns

- The CDFG established a population of chukar on SNI for use as game species for a recreational hunting program on SNI; however, the military mission has changed and recreational hunting is now prohibited.

Current Management

There is no hunting permitted on SNI; there are no game species to be managed.

Assessment of Current Management at SNI

There are no game species on the island. Chukar are present but are now considered an invasive terrestrial species. Chukar are addressed in invasive terrestrial species *Section 4.6.1: Terrestrial Invasive Exotic Species*.

4.8 Data Integration, Access, and Reporting

Specific Concerns

Managers concerned with ensuring the long-term health of the SNI ecosystem need to know what the long-term trends are in island populations and what is causing those trends. Some of these trends may be driven by drought, storm surges, El Niño-La Niña cycles, or climatic change rather than any local human activity. Populations fluctuate for a variety of reasons, and managers need to know what fraction of the variability is due to human influences.

There are a wealth of projects currently underway in the region which SNI could benefit from participating in. Conservatively, at least $17 million is spent annually monitoring in the SCB (National Research Council 1990). However, the major regional time-series monitoring programs do not contain data specific to SNI. These include:

- Sport and commercial catch reported to CDFG, in which fishermen report the number and species caught (including lobster, sea urchin, and abalone), number of anglers fishing, area fished, and hours fished. However, no reporting is done specific to Island waters.
- The California Cooperative Oceanic Fisheries Investigation examines hydrology, primary production, zooplankton biomass, and larval fish distributions. It originated in response to the collapse of the California sardine fishery in 1947. It is unparalleled in its spatial extent, duration, and consistency through time of its study of the ocean and fisheries biology. Sampling occurs in offshore and coastal waters of the SCB. However, the data it collects is best suited to regional Bight questions rather than to management questions concerning the nearshore waters of SNI.
- Data is collected on sea surface temperature and other parameters from near the turn of the century at Scripps Pier, Scripps Institute of Oceanography in La Jolla, California. However, this long term time series dataset does not directly pertain to management questions specific to SNI.
- During the last two decades, a CINP monitoring program has been developed to evaluate and predict the present and future state of ecological resources of the Channel Islands. Established in 1981, the project was designated the Vital Signs Monitoring Program and its objectives were to: determine the present and future ecosystem health; establish empirically normal limits of resource variation; provide early diagnosis of abnormal conditions; and identify potential agents of anthropogenic change (Davis 2005). This program has become a cost-effective and collaborative effort among numerous federal, state, and private interests. SNI could ensure that terrestrial monitoring is consistent with this program and share data across programs. Other programs with an emphasis on ecosystem monitoring in the marine environment have been established to help understand changes throughout California and could be adopted by the Navy for SNI marine ecosystem monitoring.

Without access to long term inventory or monitoring data, the Navy lacks the ability to make proper management decisions for this habitat, including the ability to identify concerns.

Current Management

Other agencies and universities support data collection and efforts are made to integrate, access, and report. The CINP shares information with SNI. San Nicolas Island uses similar mapping strategies to be consistent with CINP.

As a starting point SNI has utilized an EMS program to track natural resources, coastal resources, and waste products. The EMS system is a compliance requirement for the environmental program and contributes to integration access and reporting.

Assessment of Current Management at SNI

The intent of developing an SNI archival database is to help organize data for use by SNI natural resource staff. The inventory and recordation of biological field data and the development of a computerized retrieval system, such as an archival database, for these data are ongoing efforts at SNI; the development of such an archival database system would be very useful when dealing with other federal and state agencies and efforts will continue to be applied toward its development. This is particularly important for those species that may be, or are being, considered for listing under provisions of the ESA. It is also equally important to provide this information, in a usable format; to other land managers since management of species can best be accomplished when all forms of potential impacts are considered for a species throughout its entire range. Ecosystem-wide resource management requires mutual cooperation of regional land managers, regulators, and scientific groups and facilitates regional planning efforts towards common goals. If researchers or scientific organizations want natural resource data, they are encouraged to contact and request data from environmental program staff. For example, data is shared with the Island Fox Recovery Team, but in a controlled manner.

Management Strategy

Objectives and Strategies for Data Integration, Access and Reporting

Objective: Ensure the technically sound, practical and appropriate use of library and computer technology to organize, analyze, and communicate natural resource information in support of management decisions.

I. Set up a central clearinghouse for data, reports, and publications pertaining to the NBVC's EMS that addresses natural resources and that is accessible to staff.

A. Develop a plan that delineates the types of information to be included, accessible format, frequency for updating, and accessibility limits.

II. Participate in data sharing, technology transfer, and communication as applicable.

III. Seek standardization of the approach to communicate research and monitoring results.

IV. Continue to develop and maintain SNI's data management capabilities.

A. Continue to support ongoing and new research, encouraging the use of specialists to facilitate recognition and discovery of previously unrecorded species or species occurring in previously unrecorded locations.

B. Direct specific attention towards locating and identifying rare, endemic, undescribed, and potentially new species.

C. Continue to update the GIS database by setting standards for periodic update thereby keeping GIS data current.

D. Provide appropriate data to the CNDDB.

5.0 Sustainability and Compatible Use at San Nicolas Island

This Section summarizes management strategies from the point of view of the sustained use of natural resources. Landscape-level views of compatibility and sustainability are covered, to establish a tangible link between managing the natural environment and sustaining the military mission. Section 5 considers how to sustain natural resources through planning, regulatory compliance, public outreach, and linking to other programs and partners both internal and external to San Nicolas Island.

5.1 Sustainability of the Military Mission in the Natural Environment

Broadly speaking, sustainability takes a long-term view of natural resources stewardship, Navy mission accomplishment, social responsibility, and economic prosperity into the future. For this INRMP, the topic of sustainability encompasses:

- Sustainability of the Navy mission at SNI with respect to how natural resources support this mission.
- Resource-specific best practices, consistent with the Navy's EMS, for the use of renewable and non-renewable resources and how pollution and wastes are prevented and processed. The practices may address energy, water, water quality, air quality, greenhouse gas management, reducing threats both natural and human, and securing habitat for special status and indicator species into the future. This topic is also more fully developed in specific INRMP sections including: Water Quality, Cumulative Effects, and INRMP Annual Review and Metrics.
- Preparing for climate change and regional growth.
- Resource use in the built environment.
- Indicators that help monitor progress toward sustainability objectives.

5.1.1 Integrated Military Mission and Sustainable Land Use Decisions

Background

A successfully implemented INRMP will meet two basic purposes:

1. It will ensure the sustainability of all natural resources at an installation; and
2. It will ensure no net loss of the capability of installation lands to support the USDOD mission.

These two purposes are closely related and not mutually exclusive. Healthy ecosystems support realistic military training and testing needs by providing large open space, buffers, stable soils, clear air, clean water, and a range of natural conditions that are available for the indefinite future.

■ **For more information on disturbance at SNI refer to *Section 2.1.3: Facilities* and *Section 2.1.4: Transportation and Utilities*. Discussion and maps in those sections identify where concentrated areas of disturbance at SNI are located.**

Disturbances that characterize SNI include:

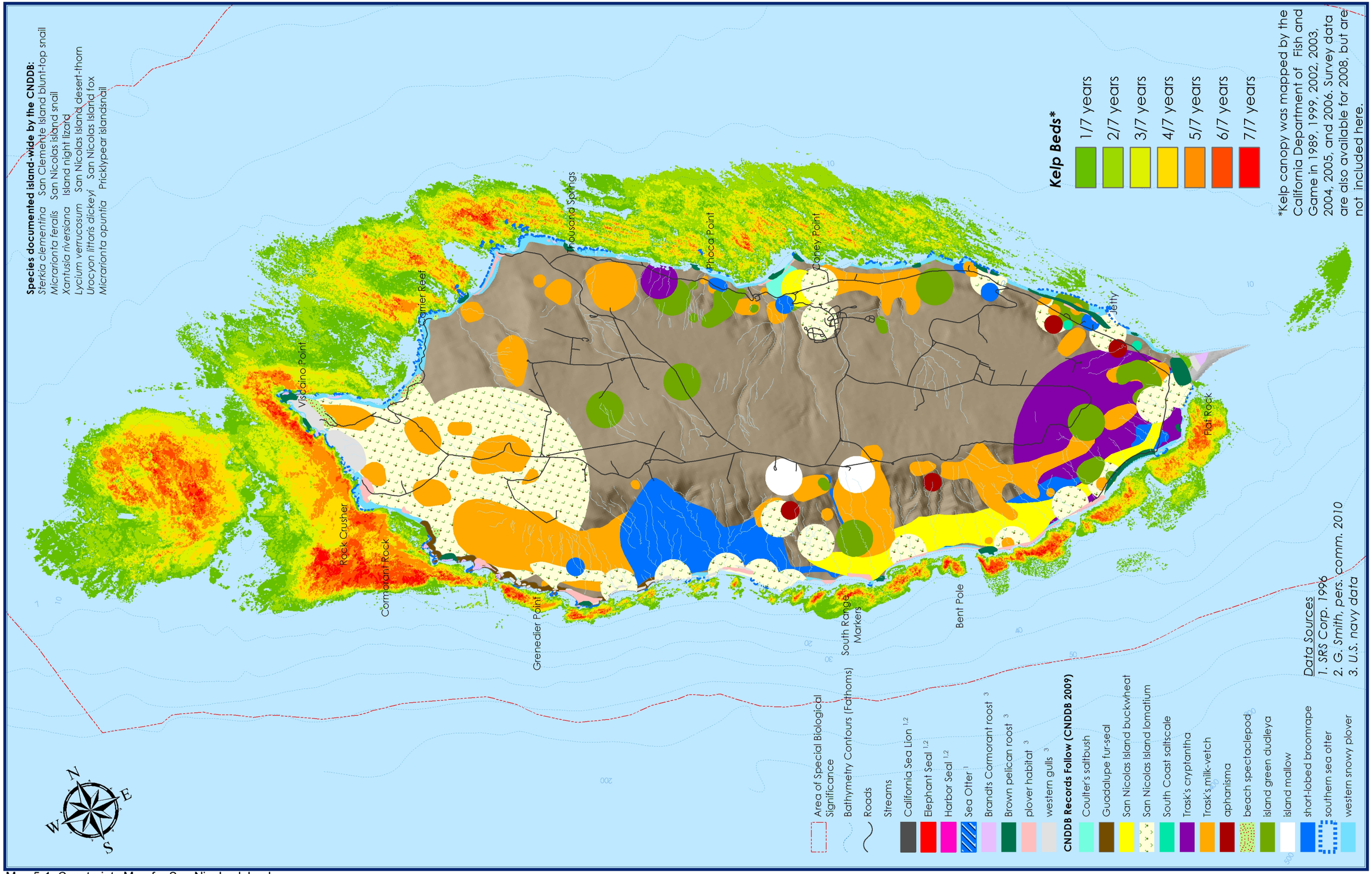
- Facility sites
- Inactive target disturbance areas
- Active target disturbance sites
- Special use sites
- Test facilities
- Instrumentation sites
- Roads

Map 5-1 shows locations of sensitive resources, as required in the INRMP Template (Memo DASN 14 August 2006) as the "Constraints Map." The map is intended to show all areas on the installation where restrictions on training or mission occur due to natural resources related issues such as listed species, soil erosion, and invasive species.

Map 5-2 shows SNI environs to consider potential buffer areas and corridors, as required in the INRMP Template (Memo DASN 14 August 2006) as the "Opportunities Map." The map is intended to show all the areas where there are little to no restrictions on training, and also illustrate potential encroachment partnering areas.

Specific Concerns

- Local metrics are not defined for sustaining the mission of the Navy at SNI. The concept of sustainability in the military and under the SAIA (under which this INRMP is a mandate) requires this INRMP to document "no net loss" to the military mission to comply with the SAIA. No benchmarks have been set up to monitor and evaluate whether this has been achieved; such benchmarks will help a natural resource manager assess sustainability at longer time scales.
- Management units are not defined that would allow for analyzing sustainability at a finer scale than all of the island and its surrounding waters at once. Management units help develop priorities and reconcile conflicts.
- Sustainability in siting and resource use is only beginning to be considered a metric of successful project design. To date, sustainability has been applied in military installations somewhat narrowly to the built environment and focused mostly on energy and recycling. It is beginning to be applied to stormwater management such as with LID approaches, and to ecological sustainability of habitats, species, and ecological functions.
- The work of professional societies from various disciplines (such as wildlife, water, soils, energy, restoration ecology, economics, development, or business), has insufficiently incorporated into Navy management with respect to a unified set of sustainability indicators.



Map 5-1. Constraints Map for San Nicolas Island

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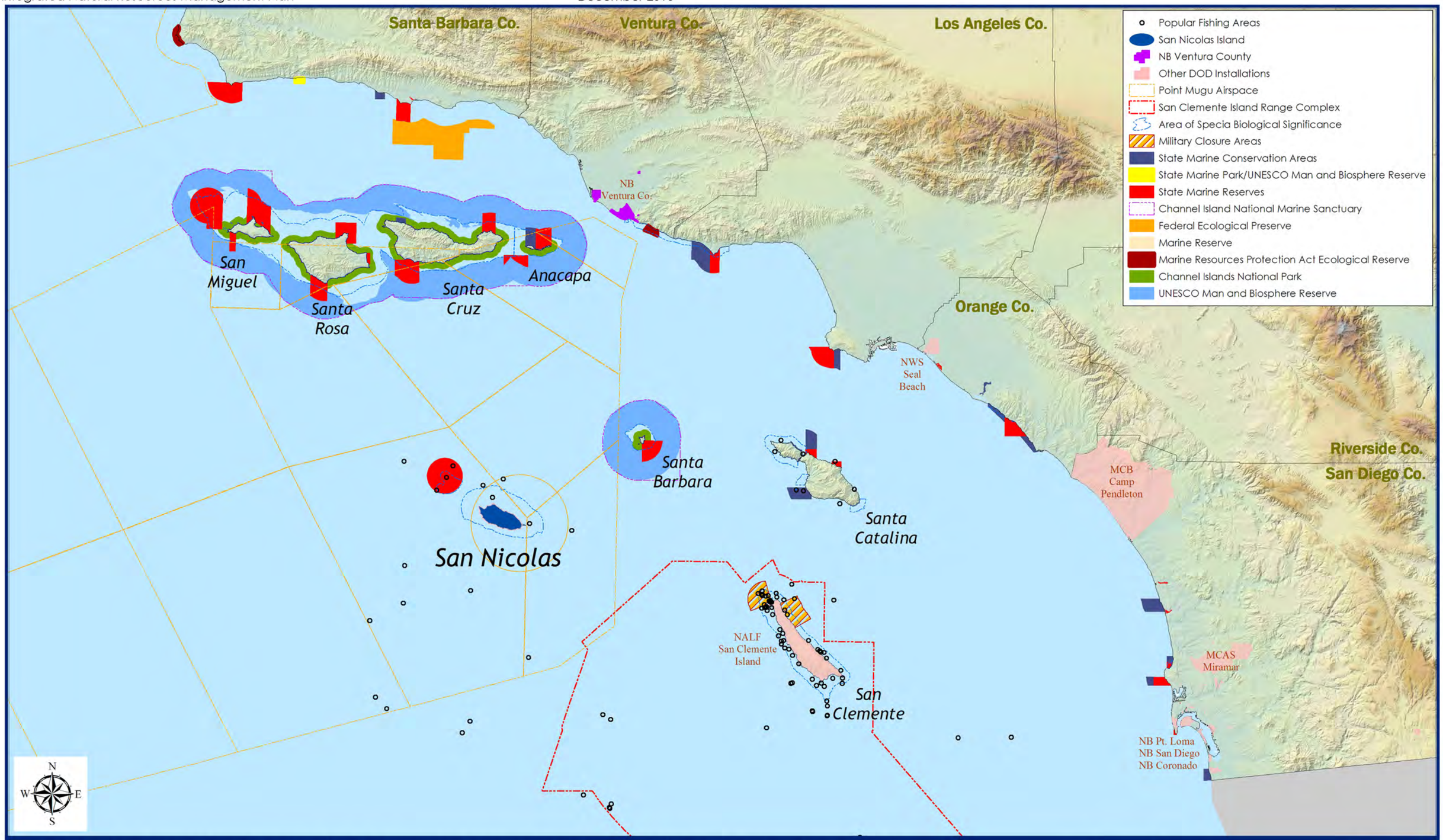

Map 5-2. Opportunities Map for San Nicolas Island, showing San Nicolos Island environs to consider potential buffer areas and corridors, as required in the Integrated Natural Resources Management Plan Template (Memo DASN 14 August 2006). The map is intended to show all the areas where there are little to no restrictions on training, and also illustrate potential encroachment partnering areas.

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Current Management

Since most of SNI's natural resources remain relatively undisturbed from current (as opposed to historic) land uses and provide a safety and security buffer zone for the RDAT&E activities, sustainable land use and a healthy ecosystem are mutually compatible. Most day-to-day activities at SNI have little potential to impact natural resources. Existing test sites are routinely re-used, taking advantage of existing instrumentation and infrastructure and avoiding environmental costs associated with establishing new areas. Most high value resource areas are in locations not intensively used for ground-related military activities. However, there is always the possibility of a change in mission which could lead to a degradation of the natural resources. Furthermore, because of the military mission some aspects of terrestrial habitat management, such as prescribed burns, cannot be utilized at SNI.

The Project Review Board and the Site Approval Process is also used to manage environmental compatibility with the military mission, and sometimes the natural resources staff provides on-site monitoring of a military operation in order to ensure environmental compliance.

Finally, each year the CO of NBVC must answer as part of the INRMP metrics review the following questions:

- Does the natural resources team consult with operators when making changes to the INRMP in order to keep it current? Coordination examples include: maps, signage, pamphlets, other communications, orientations, meetings, training, etc.
- To what level do natural resources compliance requirements support the installation's ability to sustain the operational mission?
- Has there been a net loss of training lands?
- Does the INRMP process effectively consider current mission requirements?

Assessment of Current Management

The SAIA guidance indicates the need to focus on improving the ties between natural resource management and military readiness. While the "no net loss" policy of the Sikes Act and USDOD guidance is broadly accomplished by the Range Complex Management Plan and EIS, there remain unfulfilled opportunities to facilitate the connection between natural resources and the mission. More locally specific planning criteria could be used for site selection criteria (such as using landform, soil recoverability, plant community condition and sensitivity, and considering the timing and intensity of use).

Management Strategy

Objectives and Strategies for Sustaining the Military Mission in the Natural Environment

Objective: Achieve no net loss of military value by aligning current and future land and water use (location, extent, timing, and intensity) with environmental value protection into the future, while minimizing the cost of environmental conflict resolution and mitigation.

I. Maintain and enhance existing land uses to support core RDAT&E, training, and mission-support capabilities through coordinating of all facilities siting, relocation, expansion, or change in use by continued use of the Project Review Board and the Site Approval process.

II. The placement of continuing and evolving military land uses, to the extent practicable, should be in previously disturbed areas to fully utilize existing operational areas and minimize potential effects to sensitive resources.

- **For more information on current and future land use at SNI refer to *Section 2.4: Future Use Patterns and Plans* and the "NBVC San Nicolas Island and Fort Hunter Liggett Activity Overview Plan" (NAVFACSW 2010a).**

A. Locate new facilities within existing facility footprints or other previously disturbed areas to the extent practicable.

B. Withdraw from service any surplus facilities identified for retention (meet or exceed minimum codes/standards) and future reuse.

C. Demolish excess and/or substandard facilities and reclaim landscape to an applicable reclamation standard.

D. Review proposed new uses or alterations to existing buildings or structures, in consultation with a Navy Archaeologist, to determine the eligibility of affected structures for NRHP contributing elements. As needed, analyze for potential impacts in accordance with guidelines established for NRHP-eligible buildings.

E. Conduct appropriate environmental surveys on any proposed new land use within an undeveloped area to identify sensitive natural and cultural resources, environmental resources, and IRP (hazardous waste cleanups).

III. Ensure compliance with statutes and regulations to protect sensitive natural and cultural resources, to maintain environmental quality and to exercise responsible stewardship of public lands.

IV. Ensure the public health and safety of NBVC personnel and authorized visitors by maintaining a secure military operating environment on SNI administered lands.

V. Maintain and enhance coordination and cooperation with neighboring communities, agencies, and organizations to ensure compatibility of off-island natural resource uses with the Navy's mission.

VI. Provide reasonable accommodation of compatible nonmilitary land use to the extent practicable.

VII. Maintain healthy and intact habitats that self-recover from disturbance, using principles of ecosystem management and sustainability to balance short-term projects with long-term goals.

A. Take a habitat approach to terrestrial and marine planning, rather than a species approach wherever possible. A habitat approach allows conservation of ecological linkages among species even when they are not understood.

B. Ensure the future of water that sustains the military presence is secure.

C. Manage land use compatibility by adopting management units that consider operational control.

D. Use management units to provide a finer spatial scale for analyzing military mission needs, and conserving high-value, scarce habitats and species.

E. Align infrastructure to contribute to the military mission, concentrating it in operations areas, and integrating it with the environment with proper siting and sustainability practices.

F. Use criteria in each management unit to define the resilience of the area to various types of use/disturbance patterns in order to set restoration priorities.

VIII. Address long-term threats to the stability of the natural environment including but not limited to soil erosion, invasive exotic species, climate change, sea level rise, and habitat fragementation.

A. Use ecosite planning (based on soils and vegetation classified by NRCS for soil surveys), where available, to assess the condition of habitats. For example, some plant communities appear to be missing functional groups of species, such as the loss of perennial bunchgrasses as a class of plant probably as a result of historic grazing practices. Where ecosite descriptions are unavailable, use another method that evaluates plant community composition, vegetation productivity, and soil health. Some areas of caliche are nearly completely unvegetated, and it is not known if this is the natural condition or one caused by past land use practice (sheep overgrazing).

B. Avoid the proliferation of roads.

C. Avoid and minimize road or traffic characteristics that promote plant invasions, or result in significant habitat fragmentation for animals.

IX. Continue to use NEPA documentation, including cumulative effects analysis, to guide specific projects and document choices.

X. Ensure the CO's preparedness to answer as part of the INRMP metrics review the following questions:

- Does the natural resources team consult with operators when making changes to the INRMP in order to keep it current? Coordination examples include: maps, signage, pamphlets, other communications, orientations, meetings, training, etc.
- To what level do natural resources compliance requirements support the installation's ability to sustain the operational mission?
- Has there been a net loss of training lands?
- Does the INRMP process effectively consider current mission requirements?

5.1.2 Adapting to Effects of Climate Change and Regional Growth

Specific Concerns

- Scientific research indicates that global warming will have long-term, irreversible, adverse consequences on natural resources, including terrestrial and aquatic habitats.
- The California WAP (CDFG) identifies climate change as one of four primary stressors affecting wildlife, along with growth and development, water management conflicts, and invasive species, and makes recommendations to include climate change science in restoration work.
- Models are the only way to project future changes for the SNI and the surrounding region, and to evaluate needed research, data collection, and potential management strategies. However the use of models to explore the potential implications of climate change is rife with uncertainty. A range of scenarios is possible using accepted models, and local data sets need to be developed and integrated through collaboration and consensus.
- The dynamic nature of information about climate change can be overwhelming to managers. The slow and deliberative process in which public agencies work can also be a barrier to swift implementation of strategic approaches, especially when multiple jurisdictions are involved.
- Key questions for NEPA analysis include whether the proposed action is expected to cause climate change effects, whether the proposed action combined with other past, present and reasonably foreseeable actions would cause such effects, and whether sufficient information is available to describe the nature and extent of the proposed action's effect. Developing mitigation for climate change is an emerging issue for NEPA analysis.
- Doing nothing will result in a decline to natural resources and increasing threat to infrastructure due to feedback loops from multiple causes, and a rising cost of addressing the problem. An example of a threat to natural resources that interacts through positive feedback loops is invasive species and related altered fire regime. Another could be impacts to kelp beds that cause trophic cascades that affect food web dynamics.

Current Management

The recently updated guidance for Navy INRMPs (OPNAVINST 5090.1C) added a requirement to address climate change in INRMPs. It states that "the evidence for climate change is extensive and has generated consensus in the scientific community. Addressing climate change poses a new challenge for natural resources managers who will need to understand changes in ecosystem structure and function anticipated from climate change, in addition to understanding ecosystems as they function now and as they have in the past." The guidance continues with a framework for addressing climate change issues, and this is incorporated in the strategy outline below.

Assessment of Current Management

To date, the ability to analyze climate change implications is in early stages at SNI, including the ability to incorporate climate change analyses in NEPA documents in a consistent way. Increasingly, NEPA court challenges have resulted in a legal requirement to analyze climate change in certain cases, as well as develop mitigation measures for climate change impacts. A case involving the Center for Biological Diversity v. National Highway and Transportation Safety Administration (NHTSA) 508 F.3d 508 (9th Cir. 2007) is the most demanding of climate change analysis. The court held the NHTSA was required to prepare a full EIS addressing the effects that its fuel economy standards would have on global climate. The court found: "The impact of greenhouse gas emissions on climate change is precisely the kind of cumulative impacts analysis that NEPA requires agencies to conduct." The NHTSA was required to provide contextual information about the cumulative and incremental impacts of its rule in light of other rulemakings and other past, present and reasonably foreseeable future actions, regardless of what agency or person undertakes such other actions.

Thus, agencies increasingly are expected to evaluate climate change impacts for a broad range of projects requiring federal approvals or permits. Many projects undergoing NEPA analysis will either directly or indirectly cause greenhouse gas emissions and strategies and techniques for analyzing these are needed. Many other projects will need to address climate change impacts onto the projects themselves (such as increased flash flood potential for a planned highway), or onto resources a project may impact (such as shifting habitat or species distributions due to increases in temperature).

Management Strategy

Objective and Strategies for Climate Change

Objective: Adapt and mitigate the adverse impacts of climate change through annual goal setting based on science-based scenarios, targets, collaborative planning, and adaptive management.

I. Address the anticipated shifts in species ranges and population abundances through environmental monitoring.

- *A.* Ensure plant community composition and productivity are in within the normal range expected for plant communities/ecological sites.
- *B.* Ensure sufficient soil health to prevent accelerated erosion.
- *C.* Ensure the health of intertidal and nearshore environments through monitoring.

II. Identify data and research needs for ensuring an effective response to the consequences of climate change.

- *A.* Identify species and communities resilient/vulnerable to climate change impacts by conducting climate change vulnerability assessments.
- *B.* Improve the application of models through data collection and validation (as feasible and needed) and for using such science based models in environmental and natural resource management planning.
- *C.* Improve the graphical depiction of the potential impacts of climate change scenarios for SNI to address anticipated shifts in species ranges and population abundances in climate change vulnerability assessments.

III. Adapt and mitigate the adverse consequences of climate change, including stresses on infrastructure, aquatic vegetation, erosion, and shifts in distributions of terrestrial endemic species and plant communities.

- *A.* Ensure that species/community conservation priorities and expenditures reflect climate change risks, such as those on the margins of their distribution patterns.

B. Identify restoration projects to provide habitat elements for specific species which may be altered by climate change.

C. Provide for the management of threatened, endangered, and other special status species such that changes in distribution and abundance may be understood in the context of climate change.

IV. Address the anticipated increase in extreme events by emphasizing preventative technologies.

A. Comply with guidelines on project siting.

B. Improve water conservation.

C. Improve stormwater management through LID technologies.

D. Improve coordination between natural resources and staff and development project proponents to ensure more energy efficient design features.

V. Control/reduce greenhouse gasses, the pollution that causes global warming and climate change, by updating and implementing the SNI Renewable Energy Plan.

VI. Improve and strengthen governance with respect to climate change.

A. Establish partnerships for collaboratively addressing climate change issues.

B. Analyze project impacts and cumulative effects through NEPA in a consistent way.

C. Incorporate climate change in Navy Encroachment Action planning.

D. Develop science-based agency coordination to protect, maintain, and restore at-risk habitats.

VII. Ensure that base personnel have access to climate change education and outreach in order to help minimize the most dire forecasts for global warming through modification of individual behavior and lifestyle consumption patterns that contribute to global warming.

5.1.3 Sustainability in the Built Environment

Specific Concerns

- The true long-term cost of choices is not as visible to leadership as it could be because natural resources assets are not assigned a value, and thresholds or tipping-points of change in their value are not known.
- There is a need for those involved in executing development projects for education about costs and technologies to understand the difference in environmental approaches and choices. This uncertainty hampers the adoption of more projects that meet sustainability criteria.

Current Management

Sustainable development practices produce highly efficient and cost effective buildings that reduce the use of natural resources such as water and oil, decrease pollution, and provide a healthier indoor environment. Such development takes into account the full life cycle cost of a project, including broader concerns such as its effect on the environment and the community, not just the financial cost. Refer to the NBVC San Nicolas Island and Fort Hunter Liggett Activity Overview Plan for more information on current and future development projects that are based on the principles of sustainable planning and design.

In support of promoting sustainability in the built environment, a federal task force agreed to the following set of federally accepted principles for sustainability in the built environment (adapted from the WBDG, National Institute of Building Sciences[1]):

1. Optimize siting potential. Avoid using undeveloped land, open space, water and soil conservation areas, existing natural wetlands, endangered species habitats, and floodplains. Promote compact/mixed-use development that minimizes the need to drive gas-powered vehicles and maximizes use of already developed land through infill, brownfields development, and preservation of natural, and cultural/historic resources.
2. Promote socio-economic development by involving local community residents in setting the vision for and developing plans and actions for their communities and regions, and making optimum use of existing assets in the adjacent communities. An open planning process ensures that development does not disadvantage communities in the siting of unattractive facilities.
3. Reduce the concentrations of carbon dioxide and other greenhouse gases in the atmosphere by encouraging alternatives to the use of gas-powered vehicles.
4. Optimize operations and maintenance practices to maintain specified performance levels. Minimize energy consumption while maximizing use of renewable energy sources. Encourage pollution prevention by specifying land uses that minimize or eliminate the use of extracted underground substances; and by encouraging methods of landscape design and maintenance that use native vegetation and reduce or eliminate the use of pesticides, herbicides, and synthetic fertilizers.
5. Reduce the use of water through water conservation and recycling; re-using gray water on-site and employing innovative wastewater treatment.
6. Use environmentally preferable products.
7. Enhance indoor environmental quality.

In 1994, the USGBC developed the LEED Green Building Rating System[1] to evaluate sustainability for a project. The LEED program is one of several ratings systems for energy performance. The LEED rating system is a checklist of various “green” options for building design and construction, developed through a consensus by a consortium of industry groups. It evaluates environmental performance from a "whole building" perspective over a building's life-cycle, providing a definitive standard for what constitutes a "green building." The LEED rating system’s six credit areas for new construction are:

- Sustainable Sites (includes site selection, site resource protection, landscaping, and stormwater management);
- Water Efficiency (water efficient landscaping, water conservation, and innovative technologies);
- Energy and Atmosphere;
- Materials and Resources;
- Indoor Environmental Quality; and
- Innovation and Design Process (includes exceptional performance beyond the LEED requirements).

Air quality is treated briefly, and as a subtheme only, under this topic of sustainability for this INRMP. Other topics that are mostly within the realm of the indoor environmental quality (e.g. built interiors) and therefore not addressed are: building systems, energy efficiency, building materials, waste and services, transportation, and use of historic properties.

Briefly in regards to energy efficiency, EO 13123 “Greening the Government Through Efficient Energy Management” (superseding EO 12902) directs that the federal government significantly improve its energy management. It promotes energy efficiency through building design, construction, and operation; water conservation; use of renewable technologies; and fostering markets for emerging technologies. Refer to the SNI Renewable Energy Plan for more information on how SNI will increase energy efficiency through the development of wind turbines, facilities modernization, and energy conservation measures.

1. Available online at: http://www.wbdg.org/index.asp.

1. More information regarding the USGBC or the LEED program is available online at: http://www.usgbc.org.

Many federal and state initiatives are in place for LEED certification that cover new construction and renovation, including most federal departments. California's EO #S-20-04 (December 2004) requires the design, construction, and operation of all new and renovated state-owned facilities to be LEED Silver.

For sustainable water management, the EPA has developed a guide that includes a literature review, concepts, and case studies in LID[1], and it is starting to be a requirement in stormwater permits. On 20 January 2005, the SWRCB adopted sustainability as a core value for all California Water Boards' activities and programs, and directed California Water Boards' staff to consider sustainability in all future policies, guidelines, and regulatory actions.

Low Impact Development is a site design strategy with a goal of maintaining or replicating the pre-development hydrologic regime through the use of designs to create a functionally equivalent hydrologic landscape. Hydrologic functions of storage, infiltration, and ground water recharge, as well as the volume and frequency of discharges are maintained through the use of integrated and distributed micro-scale stormwater retention and detention areas, reduction of impervious surfaces, and the lengthening of flow paths and runoff time (Coffman 2000). This contrasts with conventional approaches that typically convey and manage runoff in large facilities located at the base of drainage areas. Although traditional stormwater control measures have been documented to effectively remove pollutants, the natural hydrology is still negatively affected (inadequate base flow, thermal fluxes or flashy hydrology), which can have detrimental effects on ecosystems, even when water quality is not compromised (Coffman 2000). Low Impact Development practices offer an additional benefit in that they can be integrated into the infrastructure and are more cost effective and aesthetically pleasing than traditional, structural stormwater conveyance systems.

While standards exist for sustainable structures - "green buildings" and "water management" - there are no comprehensive guidelines and performance benchmarks for those who want to create and measure sustainable landscapes in the built environment (SSI 2010). The SSI[2] is an interdisciplinary effort by the American Society of Landscape Architects, the Lady Bird Johnson Wildflower Center at the University of Texas at Austin and the U.S. Botanic Garden to create voluntary national guidelines and performance benchmarks for sustainable land design, construction, and maintenance practices (SSI 2010).

In the Navy, the first requirement of facilities is mission support; however, as stated in NAVFACINST 11010.45, "Sustainable development is required by law and policy, and is a requirement for the Navy." Sustainable planning is the application of sustainable development principles to the planning phase of project development in Navy terms, everything up to and including completion of project documentation (DD Form 1391). The Navy's goal is to exceed the LEED "certified" level where justified by life cycle costs (NAVFACINST 11010.45).

■ **For more information on the Sustainable Sites Initiative refer to the following website: <http://www.sustainablesites.org/>.**

The Navy was the first federal agency to participate in the LEED program. In 2005, apart from the Government Services Administration, the Navy had the highest number of LEED certified structures of any federal agency at 17. The Navy continues to pursue sustainable development in its facilities requiring all applicable projects to meet the LEED Certified level, unless justifiable conditions exist that limit accomplishment of the LEED credits necessary. With the USGBC, the Navy supports development of the LEED for Homes Committee. Submission to the USGBC for certification is recommended for high visibility and to showcase projects. The Navy uses LEED as a tool in applying sustainable development principles and as a metric to measure the sustainability achieved.

1. Available online at: http://www.epa.gov/nps/lid.pdf.

2. More information on the Sustainable Sites Initiative is available online at: http://www.sustainablesites.org.

In the Navy much of sustainability planning occurs within the Regional Shore Infrastructure Plan (RSIP) process, because this is the tool where facility needs are evaluated, and siting options are examined for fulfilling them. One of the stated Navy goals of the RSIP process pertaining to natural resources sustainability principles is (as stated in NAVFACINST 11010.45): "Recognizing the environmental association of all planning recommendations and providing ecologically sustainable solutions that support and enhance the regional shore establishment." Properly following the RSIP process means that a planner is already taking a longer-term approach (NAVFACINST 11010.45).

NAVFACINST 11010.45 adds the LEED and National Governors Association (NGA) New Community Design checklist requirement to the RSIP process. The Navy's LEED checklist has the scoring shown in Table 5-1 (only elements related to natural resources are shown).

Table 5-1. Partial checklist (portion relating to natural resources) and scoring system for Navy LEED projects.

Erosion and Stormwater Control
Construction site sediment and erosion control plan that conforms to best management practices.
No net increase in the rate or quantity of stormwater runoff from existing to developed conditions, OR, if existing imperviousness is greater than 50 percent, new development will result in a 25 percent decrease in the rate and quantity of stormwater runoff.
Stormwater treatment systems designed to remove 80 percent of the average annual post development total suspended solids, and 40 percent total phosphorous.
Site Selection
If the site is FREE from the following unfavorable conditions.
Land whose elevation is lower than 5 feet (1.5 m) above the elevation of the 100-year flood as defined by Federal Emergency Management Agency. Within 100 feet (30.5 m) of any federal, state, or local wetland.
Land that provides habitat for any species on the federal or state threatened or endangered list.
If the site has any of these problems, strongly consider using another area.
Urban Redevelopment
Develop on a site classified as a brown field and provide remediation.
Conserve water use through xeriscaping with native plants.
Reduced Site Disturbance/Reduced Heat Islands
Post development landscaping uses native plants that improve habitat for native species.
Light Pollution Reduction
Do not exceed Illuminating Engineering Society of North America foot candle level requirements, AND design interior and exterior lighting such that zero direct-beam illumination leaves the building site.
Water Use Reduction
Use only captured rain, graywater, or trenched wastewater to water landscape.
Install non-potable water system for toilets, cooling towers, boilers, landscaping, vehicle washing, and other non-potable water needs.
Employ strategies that in aggregate use 20 percent less water than the water use baseline after meeting Energy Policy Act of 1992 fixture performance requirements.
Exceed the potable water use reduction by an additional 10 percent.
Comply with the Department of Energy Performance Measured Protocol.

The NGA Checklist for better land use "smart growth" approaches is the second set of standards used by the Navy. Their sustainability evaluation includes one criterion that addresses protection of open space, natural beauty, and critical environmental areas:

1. Does the project avoid fragmenting existing green space, especially natural habitats and forests?
2. Does the project design protect the local watershed? Water runoff and other factors should be examined to determine whether the development is harming the watershed. To minimize water runoff, the fraction of land paved over for streets and parking typically should not exceed 20 percent to 30 percent.
3. Does the project location avoid increasing the risk or negative impacts of natural disasters? Consideration should be given to what kinds of periodic natural hazards exist for the site and whether a specific location is vulnerable, for example, to flooding, wildfires, mudslides, beach erosion, or high winds.

NAVFAC Atlantic has developed LID design guidelines, and the Naval District Washington has implemented pilot LID projects to help maintain and restore the water quality of the Anacostia and Potomac Rivers and Chesapeake Bay, including the use of technologies such as bioretention, permeable paver, rain barrel, disconnectivity, street tree filter, storm drain inlet retrofit, and soil amendment.

Assessment of Current Management

Across nearly all sectors of environmental concern, there is unfulfilled potential to conduct operations that affect natural resources in a more sustainable manner. In addition, there are few yet emerging examples of projects that meet criteria as sustainable. Information sharing among agency practitioners with the work of professional societies in a range of resource areas is only beginning. Leadership in Energy and Environmental Design is the best integrated into agency work due to the application of EO 13423 - Strengthening Federal Environmental, Energy, and Transportation Management (January 2007). However, further work is needed to integrate approaches advocated by the Sustainable Sites Initiative program into management practices at SNI.

Many opportunities also exist for the construction of infrastructure in a way that promotes the achievement of the Navy's mission in an environmentally integrated way. For example, the use of LID approved permeable surfaces and bioswales reduces storm-water runoff and reduces contaminants of concern in stormwater runoff. Bioengineering techniques can promote favored wildlife while excluding undesirable species, such as rats. It is less expensive to design to prevent such impacts rather than to fix them after the fact.

Sustainability indicators for specific resources, such as water, energy, fisheries, wildlife, rangeland, soils, etc. are undergoing research and scrutiny for criteria and selection of the best indicators of sustainability. Professional societies collaborate in each specialty to develop BMPs, conceptual approaches at a hierarchy of scales, and position statements. Examples are "roundtable discussion forums" for water, energy, and soils. The resource roundtables, blogs, and discussion groups focus on each criterion, a category of conditions or processes that can be assessed nationally to determine if the current level of management will ensure sustainability. The indicators are developed through the expert opinions of scientists, management agency personnel, non-governmental organization representatives, practitioners, and other stakeholders. A suite of variables, when complemented with other sustainability indicators, produce a viable system to monitor at the national level the biophysical, social, and economic characteristics indicating trends of sustainability. There is a need to develop local indicators that tier off these.

The following objective and strategies are designed to improve sustainability of both development projects and natural habitats. Many are adapted from EO 13423.

Management Strategy

Objective and Strategies for Sustainability in the Built Environment

Objective: Sustain natural resources and the Navy institutional mission by enabling innovation in planning, design, project management, and implementation for development projects affecting the built environment.

I. Ensure Navy leadership has visibility with respect to the total cost of mission sustainment, day-to-day operations, infrastructure and building development, and redevelopment. This should incorporate climate change scenarios and the projected value of the loss of habitat associated with the decision for No Action.

   A. Natural resources asset valuation is needed to properly implement business decisions that affect resource capability, e.g. value of permitted air emissions, water quality permits, water resources availability. Identify those that sustain the mission. Assess their condition, quality, capacity, and value.

II. Use the RSIP/master planning/site approval/NEPA processes to bring in interdisciplinary support to decisions early in the project planning phase that includes water, air quality, engineering, and natural resources professionals.

A. Improve the integration of Navy natural resources professionals into the sustainability planning through RSIPs, NEPA, site approval, and SAPs. Facilitate early, advance project review for stormwater management, landscaping, shoreline and in-water structures.

B. Improve the integration of Navy water resources and water quality professionals into sustainability planning.

1. Go beyond pollution prevention and compliance to sustainable operations.

2. Expand the incorporation of sustainability principles into project scope and cost estimates, such as that reflected in DD Form 1391.

III. Apply sustainability principles to the management of habitats, species, and ecological functions on SNI by identifying resource-specific best practices similar to what has been done for energy and water in the built environment using LEED, LID, and SSI approaches.

A. Continue to comply with EO 13123 which tasks federal agencies with defining principles for implementing sustainable development in construction.

1. Promote sustainable land use through avoiding the use of undeveloped land, open space, water and soil conservation areas, existing natural ecosystems, endangered species habitats, and floodplains (NAVFACINST 11010.45).

a. Select a site that preserves natural resources (Credit 1 under LEED Green Building Rating System)

b. Clean up and redevelop polluted sites (Credit 3)

c. Choose the project site to protect natural resources (NAVFACINST 11010.45):

1. Consider the vegetation and topography of available sites and identify which would require the least amount of disruption in order to accommodate the project. Protect ecologically sensitive areas such as endangered species habitats, woodlands, meadows, wetlands, and water sources. Preserve culturally sensitive areas such as historic and archeological sites. Increase urban density rather than developing untouched areas. Maintain or increase the amount of green space, including planting trees, especially in densely developed areas where open parkland may not be possible.

2. Evaluate the topography of the possible sites. Accommodate topographically difficult terrain, avoiding disturbance of steep slopes where development could cause erosion. Avoid development of sites that would adversely affect watersheds or water sources. Accommodate natural watershed drainage patterns, and take advantage of water on a site in land use planning.

3. Plan for efficient use of water through use of natural drainage, drought tolerant landscaping, and recycling.

4. Reduce and manage stormwater runoff from the site. This involves consideration of a stormwater system layout and integration with existing utilities.

5. Minimize paved areas and maximize use of native vegetation that is selected from the plant palette included within the approved NBVC Landscape Plan.

6. Align proposed structures on the site to take advantage of positive, or minimize negative, climatic and weather factors such as sun angle and wind direction, thereby using passive measures to reduce energy consumption.

7. Minimize the footprint of the building and associated facilities on the site to retain open space. Bring the outside in, and the inside out, thereby connecting building occupants with nature.

8. Improve energy efficiency and reduce greenhouse gas emissions through a reduction of energy use.

9. Encourage methods of landscape design and maintenance that uses native vegetation and reduces or eliminates the use of pesticides, herbicides, and synthetic fertilizers as well as encouraging the use of compost and recycled rain or gray water (NAVFACINST 11010.45).
10. Reduce the consumption of petroleum fueled transportation and operations.
11. Prevent waste and encourage recycling to reduce the amount of trash, consistent with EO 13101.

B. Implement LID practices for protecting water quality.

C. Use construction siting, materials, and methods that promote biotic communities to the fullest extent possible.

IV. Use metrics (indicators) of sustainability that integrate environmental stewardship, mission accomplishment, social responsibility, and economic prosperity.

A. Define and adopt standards, rating systems, and metrics.

B. Collaborate with tenants to develop an integrated, measurable, installation-wide sustainability effort.

C. Incorporate metrics and standards of success meaningful to SNI. Examples are:

- LEED certification for all military construction (MILCON)s starting in a fiscal year in the future.
- NGA Checklist, New Community Design.[1]
- Habitat Indicators.
- Global warming threat reduction through reduced carbon footprint and project design that incorporate planning for climate change.

V. To develop sustainability indicators and best practices, monitor and integrate into SNI planning the work of professional societies, academic institutions, managers, business and government entities on the topic of sustainability with regard to specific disciplines and resource subsets.

A. Select sustainability indicators that have the potential to turn the generic concept of sustainability into action.

B. Select indicators that improve the quality, regularity of dissemination, and accessibility to the public of sustainability achievement.

C. Identify appropriate spatial and temporal resolutions for reporting.

D. Consider Life Cycle Assessment as a "composite measure of sustainability." It analyzes the environmental performance of products and services through all phases of their life cycle: extracting and processing raw materials; manufacturing, transportation and distribution; use, re-use, maintenance; recycling, and final disposal

E. Consider an Environmental Sustainability Index (e.g. Yale Center for Environmental Law and Policy [YCELP], Center for International Earth Science Information Network [CIESIN] of Columbia University, and World Economic Forum and the Directorate-General Joint Research Centre [European Commission] 2004).

VI. Develop a SAP at an organizational level meaningful to on-the-ground practice.

A. Rank projects based on metrics that will help meet sustainability objectives.

B. Place top-tier projects in Implementation Table for action.

C. Assign natural resources valuation to support life-cycle cost analysis.

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1. Available online at: http://www.nga.org/cda/files/072001NCDFULL.pdf.

D. Integrate anti-terrorism considerations (NAVFACINST 10110.45).

VII. Conduct training in sustainable design criteria in the Navy for engineers, construction and design specialists, water quality specialists, and biologists. This could be web-based training.

VIII. Foster socially and environmentally responsible behavior through communication.

A. Establish sustainability leadership awards for excellence in environmental, transportation, and energy management.

5.2 Construction and Facility Maintenance

Specific Concerns

- The military mission and preparedness at SNI could be impacted by ongoing erosion, as infrastructure and facilities are potentially threatened.
- Erosion control measures may be eliminated from a project as a cost-cutting measure.
- A concern associated with construction and facility maintenance projects is the introduction or spread of terrestrial invasive exotic plant species.
- Security lighting around buildings is for safety, such as lighting in uninhabited areas and in high asset locations like fuel stations. Night lighting may have environmental effects.
- Environmental Division is consulted from project inception to avoid delays in project schedule and minimize adverse environmental affects.

Current Management

By EO, the President has directed that federal agencies shall design, use, or promote construction practices that minimize adverse effects on the natural habitat where cost-effective and to the extent practicable (EO 13112). Several other laws are pertinent: CWA, CAA, ESA, NEPA, and Soil Conservation Act. Routine maintenance activities that may affect drainages fall under the USACE authority from Section 404 of the CWA. Locations where roads cross drainages are most likely to require coverage by a permit. However, most SNI activities are covered under a Nationwide General Permit, so no specific application for a permit is required.

Assessment of Current Management

On occasion there is a need to build new facilities to shore up the SNI's ability to efficiently underpin military readiness. The USDOD MILCON budget is a primary source of funds for construction. However, recent budget cuts have limited the MILCON project roster.

Management Strategy

Objective and Strategies for Construction and Facility Maintenance

Objective: Conduct construction and facility maintenance in a way that allows for protection of sensitive environmental resources and the timely, cost-effective completion of environmental documentation requirements, while ensuring full accomplishment of the military mission.

I. Fish and wildlife conservation shall be considered in all site feasibility studies and project planning, design and construction. Appropriate conservation work and associated funding shall be included in project proposals and construction contracts and specification (USDOD 4715.DD-R 1996). Funding to throughout building phases and post-construction to remove weeds, etc.

A. Develop or use proven BMPs for controlling soil erosion from construction and landscaping sites. Use the *California Stormwater Best Management Practices Handbook* (Caltrans 2000).

B. Ensure incorporation of BMPs in the preliminary engineering, design, and construction of facilities involving ground disturbance (OPNAVINST 5090.1C).

C. Vehicular traffic associated with the construction activities and operational support activities will remain on established roads to the maximum extent practicable. Areas with highly erodible soils will be given special consideration when designing the proposed project to ensure incorporation of various erosion control techniques, such as, straw bales, silt fencing, aggregate materials, wetting compounds, and rehabilitation, where possible, to decrease erosion. Rehabilitation may include revegetating or the distribution of organic and geological materials (i.e. rocks) over the disturbed area to reduce erosion while allowing the area to naturally vegetate. Additionally, erosion control measures and appropriate BMPs, as required and promulgated through the SWPPP and engineering designs, will be implemented before, during, and after construction activities.

D. Native seeds or plants, which are compatible with the enhancement of protected species, will be used to the extent practicable, as required under Section 7(a)(1) of the ESA, to revegetate staging areas and other temporarily disturbed areas.

E. Construction equipment will be cleaned at the temporary staging areas, in accordance with BMPs, prior to entering and departing the project corridor to minimize the spread and establishment of non-native invasive plant species.

F. The MBTA requires that federal agencies coordinate with USFWS if a construction or site activity would result in the take of a migratory bird. If construction or clearing activities are scheduled during nesting season (February 15 through August 31), surveys will be performed to identify active nests. If construction activities would result in the take of a migratory bird, then coordination with USFWS and Navy will be undertaken and applicable permits would be obtained prior to construction or clearing activities.

II. Promote the innovative and effective use of BMPs to prevent and control erosion and protect sensitive resources.

A. Erosion from the following sources shall be addressed through plans and BMPs, based on the priorities cited above.

1. Paved and secondary (unpaved) roads and culverts. Specific methods (BMPs) are cited in the *California Department of Transportation Statewide Storm Water Management Plan* (2003).

2. Utilities, pipelines and underground cables.

B. Monitor resource condition and effectiveness of BMPs as mitigation.

C. Monitor and enforce compliance with BMPs.

III. There is a long-term desire to underground as many utility lines as possible in order to avoid their use as perches by predators on federally protected species.

IV. Encourage protocols for emergency repair of infrastructure so that human life, health and safety are given precedence, but sensitive resources are also protected. Emergency repairs need to be anticipated so environmental damage, which is typically worse in an emergency than during a planned repair, can be reduced.

A. Investigate means to improve successful acquisition of funding for preventive repair of infrastructure, to avoid more environmentally damaging emergency repairs.

5.2.1 Road Maintenance

Specific Concerns

- Roadside maintenance can facilitate the spread of invasive plants.
- Timing of roadside maintenance may disturb migratory birds.
- Of necessity, paved and unpaved roads and other infrastructure will traverse sensitive environmental and cultural areas. Routine maintenance may be hampered by the need to comply with requirements to protect sensitive habitat unless there is advanced early coordination. With proper planning, delays and impacts can be avoided or minimized.

Current Management

- **For more information on grasslands habitat refer to *Section 4.3.1.4: Grasslands*.**

Road maintenance mowing activities often occur in grasslands habitat. Impacts from road development and maintenance are generally avoided and minimized through the Project Review Board and the Site Approval and Project Review Process codified in NBVCINST 11010.1. Management of roads also take into consideration and coordination with cultural resource management efforts focused on SNI's archeological resources.

Assessment of Current Management

Continued utilization of the Project Review Board and the Site Approval and Project Review process are necessary and sufficient to avoid and minimize impacts to sensitive natural and cultural resources associated with conducting road maintenance activities on SNI.

Management Strategy

Objectives and Strategies for Road Maintenance

Objective: Improve the soundness of road maintenance practices to avoid and minimize environmental impacts, to control non-native species, enhance biodiversity, and protect sensitive species, soil productivity, watershed functioning, and water quality.

I. Develop a 5–10 year Long-term Road Maintenance Plan. Update and improve road maintenance best management practices. Improve the way road shoulders are managed, such as managing the timing of mowing with respect to migratory birds, and ensuring storm water is managed so as to protect wetlands.

II. Comply with CWA Section 404 Permit and Section 401 State Water Quality Certification if a project may affect a floodplain, wetlands or watercourses.

- **The Navy will provide leadership in avoiding direct or indirect development of flood plains, and in restoring and preserving the natural and beneficial values served by floodplains. The Navy must evaluate potential effects of actions in floodplains and provide early opportunity for public review of proposals in floodplains. According to EO 11988, Floodplain Management of 24 May 1977, a "floodplain" shall mean the lowland and relatively flat areas adjoining inland and coastal waters including floodprone areas of offshore islands, including at a minimum, that area subject to a one percent or greater chance of flooding in any given year.**

A. Floodplain use permits: Activities requiring a permit include any development in a floodway and floodplain that may obstruct, divert, or retard flood flows, or which may affect flood elevations and flood protection. Also, activities may include placement of fill, roads, bridges, culverts, transmission lines, irrigation facilities, storage of equipment or materials, excavation, and new construction of or additions to mobile homes and residential and commercial buildings.

B. A NPDES permit for stormwater discharges from construction activities is required of owners/operators of construction sites where five or more acres of land will be graded or disturbed. They must apply for coverage under EPA's General Permit for storm water discharges associated with construction activities (effective 01 October 1992).

1. Activities requiring a permit include construction where five or more acres will be graded or disturbed. A project cannot be phased to avoid permit compliance or application for a permit.
2. A SWPPP must be prepared prior to the Notice of Intent is filed and records maintained of site inspections. The SWPPP is kept on site and not submitted to EPA or the RWQCB unless requested.

C. Actions that result in a discharge of dredged or fill material into waters of the U.S., including wetlands, most likely will require a Section 404 permit. Utility and road crossings, bridges, bank protection, boat launch ramps, sand and gravel mining, and fill associated with residential and commercial development are typical activities which require 404 permits.

1. A project may qualify for a nationwide permit, an individual permit, or a Letter of Permission. Check with the Natural Resources Manager.

2. Section 401 state water quality certification is required prior to issuance of 404 permits from USACE.

3. Seek and obtain regional 404 permits (four months in advance) from USACE, if needed.

4. Obtain a five-year regional permit for all routine maintenance practices.

D. CWA Section 401 requires a review of federal permits, actions, and approvals that may result in a discharge to waters of the state (including wetlands and many washes) to ensure compliance with state water quality standards to restore and maintain the chemical, physical, and biological integrity of the Nation's waters. This permit is necessary whenever any other CWA permits are required.

E. Provide project proponents and the Facilities Manager direction on how to implement a USACE Nationwide permit, as well as direction on applying for CWA permits not covered by Nationwide permits.

F. Obtain the following concurrently with regional 404 permit: 401 permit from California RWQCB, CDFG Streambed Alteration Agreement, documentation of contact with State Historic Preservation Officer, and documentation of contact with USFWS.

The USACE and EPA have joint enforcement authority to pursue civil and/or criminal penalties. Potential penalties for Section 404 violations include a maximum criminal fine of $50,000/day and imprisonment for up to three years and a maximum civil penalty of $25,000/day of violation.

III. In order to comply with environmental requirements in a cost-effective manner, realign record-keeping on infrastructure to facilitate environmental documentation, permitting and mitigation planning.

A. Keep specifications for each culvert, road structure, road, utility line, communication line, and other infrastructure in an electronic format so they can be reproduced at any scale, updated as needed, and in sufficient detail to assist in environmental compliance and monitoring.

B. Keep design and maintenance plans, protocols, procedures and other records on hand as required in the USACE permit application for wetlands disturbance to facilitate the SNI permitting and NEPA process for the projects.

IV. Apply principles of "Integrated Vegetation Management,[1]" which are similar to the principles of grazing management, to meet multiple objectives for roadside maintenance to alleviate harmful environmental impacts and enhance possible benefits.

A. Consider that roadside mowing strategy makes key decisions about time, space, and intensity that affect what flora and fauna grows after mowing.

1. Mowing once or twice a year favors a richer plant palette than mowing more often, which favors a few tolerant species (Forman *et al.* 2003).

2. The combination of seasonal timing and frequency of mowing has an even more major impact on plant diversity, and offers a many management choices to work with (Forman *et al.* 2003).

3. Consider impacts to sensitive wildlife such as nesting birds, Island night lizard, and the San Nicolas Island fox when making decisions about time, space, and intensity of roadside maintenance activities.

B. Adopt a focus on improving the ecological condition of roadsides to enhance biodiversity, reduce non-natives, and control stormwater pollutants, and provide cultural and natural resource education (Forman *et al.* 2003).

1. For more information on Integrated Vegetation Management refer to the Integrated Vegetation Management Partners website at: http://ivmpartners.org.

1. Use a range of spatial and temporal techniques to broaden the range of native vegetation on roadsides, and reduce non-natives.
2. Where possible, recuperate the natural surface heterogeneity to incorporate more diverse habitat elements.

C. Seek to reduce mowing frequency and intensity.

V. Adopt a Mowing Instruction that provides roadside fire safety and minimizes detrimental environmental effects.

5.3 Communications Towers, Wind Farms, and Power Lines

Specific Concerns

- There is concern about growing impacts from communications towers, power lines, and wind farms to migratory birds protected under the MBTA of 1918, as amended. Communication towers may kill from 4-5 million birds per year. Collisions with power transmission and distribution lines may kill anywhere from hundreds of thousands to 175 million birds annually, and power lines electrocute tens to hundreds of thousands more birds annually. The avian risk assessment study for the SNI Wind Energy Project EA (NAVFACSW 2010b) estimated 20.13 avian fatalities, including 0.07 raptors per year for the 11 proposed wind turbines.
- The construction of new towers creates a potentially significant impact on migratory birds, especially some 350 species of night-migrating birds. Communications towers are estimated to kill 4-5 million birds per year, which violates the spirit and the intent of the MBTA and the CFR at Part 50 designed to implement the MBTA. Some of the species affected are also protected under the ESA and Bald and Golden Eagle Act (16 USC 668-668c).

Current Management

Impacts associated with communications towers, wind energy facilities, and power lines are generally avoided and minimized through the Project Review Board and the Site Approval and Project Review Process (NBVCINST 11010.1). Guidance on communications towers from the USFWS such as the “Service Guidance on the Siting, Construction, Operation, and Decommissioning of Communications Towers” will also be used to manage these towers (USFWS 2000). The conservation, avoidance, and minimization measures outlined in the SNI Wind Energy Project BO (USFWS 2010) and Wind Energy Project EA (NAVFACSW 2010b) will be followed for the proposed wind energy project on Skyline Drive. Guidance on wind energy facilities from the California Energy Commission (CEC) and the CDFG such as the "California Guidelines for Reducing Impacts to Birds and Bats from Wind Energy Development" (CEC and CDFG 2007) was referenced in the SNI Wind Energy Project BO (USFWS 2010) and the Wind Energy Project EA (NAVFACSW 2010b).

Assessment of Current Management

The continued utilization of the Project Review Board and the Site Approval and Project Review Process is necessary in order to avoid and minimize impacts associated with the planning, construction, and operation of communications towers, wind farms, and power lines. Supplemental adherence to USFWS guidance for communications towers and CEC and CDFG guidance for wind energy facilities will provide a sufficient level of management to further avoid and minimize impacts associated with the planning, construction, and operation of such facilities.

Management Strategy

Objective: Safeguard military readiness by maintaining communications towers and wind farms while avoiding and minimizing impacts to native wildlife and plants.

Objective and Strategies for Communications Towers, Power Lines and Wind Farms

I. Ensure siting criteria for communications towers, power lines, and wind farms are addressed through the Project Review Board (NBVCINST 11010.1).

II. Use established protocols, such as the Service Interim Guidance on Avoiding and Minimizing Wildlife Impacts from Wind Turbines (USFWS 2003b) and the California Guidelines for Reducing Impacts to Birds and Bats from Wind Energy Development (CEC and CDFG 2007), to evaluate and rank potential sites proposed for wind development.

- **Protocols to evaluate and rank potential sites proposed for wind development are designed to identify and evaluate so-called "reference sites" - areas where wind development would result in a maximum negative impact to wildlife and habitats. These reference sites are then used to rank sites proposed for actual development. The protocol is intended to be used nationwide.**

III. Comply with California Energy Commission and CDFG guidelines for reducing impacts to birds and bats from wind energy development to the greatest extent possible (CEC and CDFG 2007).

A. Conduct mortality surveys at operational wind farms as described in Chapter 5 of "California Guidelines for Reducing Impacts to Birds and Bats From Wind Energy Development" (CEC and CDFG 2007).

IV. Comply with avoidance and minimization measures during the operation phase of wind energy facilities as identified in the EA for the Development of Wind Energy Facilities on SNI (NAVFACSW 2010b).

A. Comply with General Biological Resource Measures.

1. Invasive pest plant species will be controlled through appropriately timed herbicide applications and/or physical removal.

2. Air operations and maintenance program will be implemented to ensure the continued effectiveness of postconstruction BMPs once construction is completed. Maintenance activities will vary depending on the BMPs in place, but will include the following:

a. Perform quarterly inspections of storm water drains, basins, and BMPs.

b. Clean and remove debris from BMP inlets, outlets, or catchments after major storm events (more than 2 inches [5 cm] of rainfall).

c. Maintain vegetated BMPs (e.g. maintaining swales and/or detention/retention systems to original cross sections and infiltration rates).

d. Remove accumulated trash, debris, and/or sediment from BMPs before each wet season (i.e. September).

e. Repair or replace armor rock or stone aggregate that serves as scour protection (e.g. rip rap).

f. Repair erosion areas and stabilize repairs with additional erosion control protection.

g. Implement structural and nonstructural programs (i.e. routine procedures or practices) to prohibit the storage of uncovered hazardous substances in outdoor areas.

3. All permanent and visiting personnel will be required to attend an environmental briefing that emphasizes Federal and Navy regulations pertaining to the protection of listed and rare species and their environment.

B. Comply with Avian and Bat Species Specific Measures.

1. Ensure all wind energy facility operations are compliant with the MBTA. Active nests (i.e. nests with eggs and dependant chicks) are protected year-round by the MBTA. Project-related activities that will require disturbance, require removal of an active nest, or cause a breeding bird to leave the nest for prolonged lengths of time will not be permitted.

2. To the greatest extent feasible, vegetation clearing along the road and at the wind energy facility site should be scheduled to avoid the nesting season for birds from 15 December to 30 June.
3. Trimming or removal of vegetation during the peak breeding season (15 December through 15 June) will require a pre-activity survey by the project biologist to determine that active nests will not be affected. If an active nest is found at any time, actions that could harm the nest will cease and a qualified Navy biologist will be contacted.
4. A postconstruction mortality study will be designed and implemented to determine mortality rates associated with wind turbine collision.
5. Avian mortality estimates for the operation of the wind energy facility may not necessarily accurately account for estimates of potential mortality of nocturnal migrating passerines due to the lack of available data for this avian group (e.g. flight behavior and flight height). While research suggests that nocturnal migrants infrequently collide with operating turbines (Erickson *et al.* 2001), this scenario is not well studied. Avian mortality documented in postconstruction mortality studies or observed incidentally will be reported to and discussed with the USFWS on an annual basis.

C. Comply with water resources measures.
1. Once construction and of each wind turbine construction phase is completed, an effective operations and maintenance program will be implemented to ensure the continued effectiveness of postconstruction BMPs. Maintenance activities would vary depending on the BMPs in place but would include the following:
   a. Removing accumulated trash, debris, and/or sediment from BMPs before each wet season (i.e. September).
   b. Repairing or replacing armor rock or stone aggregate that serves as scour protection (e.g. rip rap).
   c. Seeding or sodding to restore or maintain ground cover where it has been previously been applied.
   d. Repairing erosion areas and stabilizing repairs with additional erosion control protection.
   e. Removing and replacing all dead and diseased vegetation as necessary to maintain vegetation coverage and minimize erosion.
   f. Implementing structural and nonstructural programs (i.e. routing procedures or practices) to prohibit the storage of uncovered hazardous substances in outdoor areas.

V. Comply with USFWS guidelines for reducing fatal bird strikes on communication towers, such as the Service guidance on the siting, construction, operation and decommissioning of communications towers (USFWS 2000), to the greatest extent practicable.

5.4 Beneficial Partnerships and Collaborative Resources Planning

Specific Concerns

Cooperative management of terrestrial and marine SNI flora and fauna is required under the federal SAIA and the Fish and Wildlife Coordination Act. Like NEPA, the Fish and Wildlife Coordination Act is essentially procedural as no specific outcome is mandated. The USFWS and CDFG have a statutory obligation to review and coordinate on INRMPs. Recognizing this core, three-way partnership in preparing, reviewing, and implementing INRMPs among the USDOD, USDOI, USFWS, and state fish

and wildlife agencies, a Tripartite Agreement was signed in January 2006. The CDFG and other state fish and wildlife agencies were represented by the IAFWA. The desire is for "synchronization of INRMPs with existing fish and wildlife service and state natural resource management plans" and "mutually agreed-upon fish and wildlife service conservation objectives to satisfy the goals of the Sikes Act."

Current Management

The SAIA provides a mechanism whereby the USDOD and USDOI and host states cooperate to plan, maintain, and manage fish and wildlife on military installations. Sikes Act provisions and cooperative agreements for outdoor recreation, such as for hunting and fishing, are implemented nationally by an MOU between the USDOD and USDOI. The SAIA no longer requires a Cooperative Agreement with the USFWS or CDFG as a separate document; however, the USDOD 17 May 2005 guidance states that joint review should be reflected in a memo or letters.

The USDON policy calls for its installations to expand involvement in regional ecosystem planning, management, and restoration initiatives. Establishing cooperative planning efforts with surrounding land agencies and individuals will benefit SNI natural resources and those of the entire region. Cooperative planning can also reduce the costs of actions that require management across boundaries such as biological monitoring.

- **U.S. Department of the Navy policy calls for its installations to expand involvement in regional ecosystem planning, management and restoration initiatives.**

The Navy also sees partnerships as a means to manage encroachment pressure on the Navy mission. The definition of encroachment is defined in OPNAVINST 11010.40: "Any Navy or non-Navy action planned or executed in the vicinity of a Naval activity or operational area which inhibits, curtails, or possesses the potential to impede the performance of the mission of the Naval activity." The instruction also defines encroachment to be any lack of action by the Navy to coordinate with local jurisdictions, monitor the development plans of adjacent communities, or adequately manage facilities and real property.

The FY 2003 NDAA included a provision, codified as Title 10 USC 2684a, which provided a new tool to help control encroachment by executing agreements with public and private partners to acquire real estate interests near installations to help preclude environmental restrictions on military training and testing operations. Areas suitable for these encroachment partnering agreements are to be identified during the development and revision of INRMPs and mapped as a GIS theme and reported up the chain to program needed funding (CNO Guidance April 2006). The idea is to work with installation planners to identify natural areas adjacent to the installation, that if set aside through these agreements, can protect current and future mission requirements. Commander Navy Installations Command N46 is the resource sponsor for encroachment partnering projects.

Currently, SNI natural resources staff actively participate in regional planning processes such as predator control (e.g. CINP, Montrose Settlement), and are cooperators in many university research programs. "Partnerships" among private, local, state, tribal, and federal interests are vital to help realize ecosystem management, the basis for management of USDON lands and waters.

Ecosystems and the species that populate them (especially migratory species) usually transcend administrative boundaries, and their conservation can best be accomplished through cooperative ventures. 'Preserving all the parts' with an emphasis on habitats is central to the ecosystem management approach mandated by USDOD. The ecosystem approach involves going beyond addressing short-term approaches one species at a time.

The NBVC and SNI natural resource managers have other potential partners for conservation planning in the California Channel Islands. The California Channel Islands include SNI, SCI, Santa Catalina Island, Santa Barbara Island, Anacapa Island, Santa Cruz Island, Santa Rosa Island, and San Miguel and associated Prince Island.

Eighty-six percent of Santa Catalina Island is managed by the Catalina Island Conservancy, the primary focus being the preservation of native plants, animals and biotic communities.

Five of the eight California Channel Islands fall within the boundaries of the NPS's CINP: San Miguel Island, Santa Rosa Island, Santa Cruz Island, Anacapa Island, and Santa Barbara Island.

Several of these California Channel Islands are also either owned by the Navy or provide Navy instrumentation sites that are critical to Sea Range operations. The California Channel Islands that the Navy owns include SNI, SCI, and San Miguel Island and associated Prince Island (NAWCWD 2002). The islands that the Navy does not own but has developed instrumentation sites include Santa Cruz Island and Santa Rosa Island (NAWCWD 2002).

The U.S. Navy owns San Miguel Island and associated Prince Island; however, these islands are managed as part of the CINP under an MOU with the NPS (CINP 2010). There are no facilities on San Miguel Island or associated Prince Island, except for an unmanned, remotely interrogated solar powered automatic weather station that is located on San Miguel Island (NAWCWD 2002).

The majority of Santa Cruz Island is owned by the Nature Conservancy and the NPS. The NPS owns 14,733 acres of the eastern portion of Santa Cruz Island (NAWCWD 2002). The Nature Conservancy owns and manages the western 76 percent of Santa Cruz Island (CINP 2010). However, the U.S. Navy has a 10 acre (4 ha) lease from The Nature Conservancy on the southeast part of Santa Cruz Island at a radar site that serves as an instrumentation facility for PMSR (NAWCWD 2002). Use and management of the bunkhouse facility and utility systems at the radar site on Santa Cruz Island are accomplished through an interagency agreement between the U.S. Navy and NPS (CINP 2010).

Santa Rosa Island is owned by the NPS. There are no Navy facilities on Santa Rosa Island except for a tracking antenna (NAWCWD 2002).

The Channel Islands National Marine Sanctuary (CINMS) also encompasses the waters within six nm of the CINP, which includes the nearshore waters encompassing San Miguel Island and associated Prince Island, Santa Cruz Island, Santa Rosa Island, Anacapa Island, and Santa Barbara Island. The CINMS was established in 1980 for the purpose of protecting areas off the southern California coast, which contain significant marine resources.

Assessment of Current Management

The potential conservation partners include:

- BLM and the CCNM
- USFWS Recovery Plans
- CDFG's WAP for the California Marine Region, and NCCP regional plans
- CINP Resource Management Plan
- NOAA National Marine Sanctuary program planning
- NMFS habitat conservation planning

Regulatory partners include:

- USFWS Ecological Services
- NMFS
- LARWQCB, for the ASBS No. 21, Ventura County (Map 4-1) (U.S. Navy 2005). This designates waters surrounding SNI and Begg Rock to a distance of 1 nm offshore or to the 300-foot isobath, whichever is the greater distance. An ASBS is "a non-terrestrial marine or estuarine area designated to protect marine species or biological communities from an undesirable alteration in natural water quality.
- FAA
- USCG

Management Strategy

Objective and Strategies for Beneficial Partnerships and Collaborative Planning

Objective: Be proactive in cooperative resources planning partnerships to create regional conservation, ecosystem-based solutions of mutual benefit while also protecting the military mission.

I. Continue to participate in the conservation and encroachment planning.

II. Participate in regional conservation and ecosystem planning efforts, in collaboration with other government agencies.

- *A.* SNI involvement on the following criteria:
  - *1.* Evaluation of agreements that may encumber land or resources now or in the future. Emphasize the critical importance of ensuring continuation of the military mission and its unique attributes which cannot be replaced.
  - *2.* Evaluation of the potential benefits to SNI natural resources.
- *B.* Pursue pertinent USDOD ecosystem management policies, including:
  - *1.* Maintain and improve the sustainability and biological diversity of the island ecosystem at the local landscape and other relevant ecological scales.
  - *2.* Promote development of the best available scientific and field-tested information for use in land management decisions.
  - *3.* Support U.S. Navy and USFWS partnering efforts through active participation.
  - *4.* Become a nonbinding partner in regional conservation planning.

III. Seek planning partnerships for invasive species and feral animal removal with adjacent landowners if compatible with mission activities.

IV. Consult with USFWS and CDFG at least annually to fulfill SAIA provisions and related inter-agency cooperative agreements.

- *A.* Ensure compatibility with INRMP goals, objectives, and policies as well as internal consistency in future inter-agency agreements and plans.
- *B.* Involve state and federal resources agencies in the implementation of INRMP objectives and policies when practicable.
- *C.* Promote information sharing and scientifically-based, coordinated data collection and management planning.
- *D.* Continue to participate in an SNI Natural Resources Partnering Team.
- *E.* Support California WAP goals and objectives described below.
  - *1.* Federal and state agencies should partner to advance marine stewardship in areas of jurisdictional overlap, especially with regard to marine protected areas. Multiple federal and state agencies, with varying mandates, have jurisdictional authority over marine waters off California. For example, NOAA manages fisheries via the Pacific Fishery Management Council (PFMC) and regulates the use of vast tracts of coastal ocean via the National Marine Sanctuaries program. Additionally, the NPS is charged with protecting and conserving marine species on land and in the nearshore marine environment. The BLM manages the CCNM, composed of more than 20,000 offshore rocks. On the state level, the CDFG manages and conserves marine resources within state waters; the CCC regulates and oversees development and use of the coastal zone; the California State Coastal Conservancy promotes public access to the coastline and protection and enhancement of marine resources; State Parks operates several coastal protected areas; and the SWRCB protects ocean

water quality. To implement stronger, more well-coordinated and sustainable policies, all agencies with jurisdiction in California's coastal waters should promote and engage in multiagency partnerships where jurisdictions overlap and missions are complementary.

2. The federal and state resource agencies should expand efforts to eradicate introduced predators from all seabird colonies. The state and federal resource agencies with authority to manage mainland areas and islands that support seabird colonies (NPS, CDFG, California State Parks, and the U.S. military) should expand their collective efforts to completely eradicate all introduced terrestrial predators (primarily rats and cats) from the seabird colonies and roosting areas. Control predators around mainland colonies of endangered species, such as beach-nesting colonies of western snowy plovers.
3. Federal and state resource agencies and institutions should foster and facilitate interstate collaborative research on marine species whose ranges cross jurisdictional boundaries. Species like the gray whale and the black oystercatcher are good examples of broadly distributed species that warrant multistate collaborative research and cooperative management.
4. Federal and state resource agencies should foster and facilitate interstate collaborative enforcement efforts on marine species whose ranges cross jurisdictional boundaries.

F. Support USFWS Regional goals such as habitat conservation planning.

G. Review metrics for the installation so that questions in the INRMP metrics builder online can be answered annually.

5.5 Public Access

Specific Concerns

- U.S. Department of Defense installations are to provide for sustained public access and use of natural resources for educational or recreational purposes when such access is compatible with mission activities, and with other considerations such as security, safety, or resources sensitivity (USDOD 1996[1]).

Current Management

Outdoor recreation, as defined for the purposes of this section, is the active use of the installation's natural resources for recreation and physical exercise. There is no current authorized hunting on SNI by military personnel; however, recreational fishing by military personnel is allowed with a standard CDFG fishing license.

The Navy is also required to provide outdoor recreation and interpretive opportunities to the public where and when it is compatible with military needs; however, SNI is not open to the public due to reasons including the military mission, safety, security, and resource sensitivity.

Assessment of Current Management

SNI does not have the capability for an extensive public access and recreation program for several reasons, including the following.

- There are general security and liability issues.
- Any outdoor recreation that might be provided should be non-mechanized to provide fire safety, and day use only.
- Other islands are available for public access.

1. USDODDIR 4715.3 -Environmental Conservation Program Issued 03 May 1996. Available online at: http://www.dtic.mil/whs/directives/corres/dir.html

There is no special demand for use of SNI property for recreational access, neither by the public nor its USDOD employees. The nearby islands provide public access.

Management Strategy

Objective and Strategies for Public Access

Objective: Ensure public access is discouraged with the exception of temporary uses that are compatible with San Nicolas Island mission, natural resources responsibility, safety, and security.

I. Maintain clear and coherent policies regarding public access to SNI.

A. Planning for public access shall consider, but not be limited to, the following topics (USDODDIR 4715.3):

1. Eligible users of installation resources and facilities, including the installation's method of determining user eligibility and priorities;

2. Procedures required for the public to gain access;

3. Accessible and off-limits resources, areas and facilities;

4. Areas designated for special use;

5. Points of access and egress;

6. Periods of access;

7. List of permitted and prohibited activities;

8. Schedule of applicable fees and charges;

9. Personal injury and property liability policy;

10. Access agreements with agencies and organizations, including Native American access to traditional cultural sites; and

11. Installation-established access quotas to reflect installation operational and wildlife carrying capacity.

B. Protect sensitive resources from incompatible public uses.

C. Provide access for agencies and others to conduct natural resources research on the installation to the extent it does not interfere with the military mission or resources sensitivity. Any studies or surveys must be approved by the CO.

II. Take active measures to discourage trespass.

A. Ensure that maps and any other informational materials provided to the public clearly show the boundaries of and restricted areas of SNI.

5.6 Public Outreach

Specific Concerns

- U.S. Department of Defense installations are to provide for sustained public access and use of natural resources for educational or recreational purposes when such access is compatible with mission activities, and with other considerations such as security, safety, or resources sensitivity (USDOD 1996).

Current Management

The Navy is committed to public outreach where and when it is compatible with military needs. SNI is not open to the public due to reasons including the military mission, safety, security, and resource sensitivity. Given this context, public outreach for natural resource activities that occur on SNI are limited.

Assessment of Current Management

There is no special demand for use of SNI property for public outreach. The nearby Channel Islands National Park provide an opportunity for the public to learn more about the California Channel Islands.

Management Strategy

Objective and Strategies for Public Outreach

Objective: Build a strong conservation ethic and personal commitment to natural and cultural resources stewardship through the promotion of education and awareness of the unique environmental setting and history of San Nicolas Island, as well as the San Nicolas Island mission.

I. Participate in Earth Day and annual science festivals on the mainland.

II. Identify natural resource themes for public outreach. Examples are marine mammals, endemic plants, seabirds, and the kelp forest.

5.7 Consistency With Other Plans

Consistency With California Wildlife Action Plan

Congress asked each state to develop a WAP to examine the health of wildlife and prescribe actions to conserve wildlife and vital habitat before they become more rare and more costly to protect. In response, the CDFG developed the California WAP. The WAP for the conservation of species and their habitats and recommends conservation actions that address stressors to habitats. It calls for federal-state partnerships and partnerships with Non-governmental Organizations (NGOs) and a multitude of institutions in California with a stake in wildlife, land, and aquatic management. The WAP provides guidance to these partnering institutions by identifying wildlife and habitat conservation goals and information needs at a strategic level.

Other Regional Planning Efforts

Table 5-2 lists other planning documents from a variety of sources. For a more complete list, refer to *Section 1.12: Integrating Other Plans*.

Table 5-2. Various planning documents that are incorporated into this Integrated Natural Resources Management Plan .

Authoring Agency	Title	Date
U.S. Department of the Navy	Naval Air Warfare Center Aircraft Division/Weapons Division Strategic Plan	2008
U.S. Department of the Navy	Naval Air Warfare Center Weapons Division Point Mugu Sea Range Environmental Impact Statement/Overseas Environmental Impact Statement	2002
U.S. Department of the Navy	United States Navy Pacific Fleet Souther California Range Complex Environmental Impact Statement/Overseas Environmental Impact Statement	2008
U.S. Department of the Navy	Naval Base Coronado San Clemente Island Integrated Natural Resources Management Plan	2002
U.S. Fish and Wildlife Service	North American Waterfowl Management Plan	2004
U.S. Fish and Wildlife Service	North American Waterbird Management Plan	2002
U.S. Fish and Wildlife Service	United States Shorebird Conservation Plan	2001
U.S. Fish and Wildlife Service	Regional Seabird Conservation Plan Pacific Region	2005
U.S. Fish and Wildlife Service	Partners-in-Flight Landbird Conservation Plans	
U.S. Fish and Wildlife Service	California Channel Islands Species Recovery Plan	1984
U.S. Fish and Wildlife Service	Final Revised Recovery Plan for the Southern Sea Otter	2003a
U.S. Fish and Wildlife Service	Recovery Plan for the Pacific Coast Population of the Western Snowy Plover	2007
U.S. Fish and Wildlife Service	Draft Post-Delisting Monitoring Plan for the Brown Pelican	2009
National Park Service	Channel Islands National Park General Management Plan	1985
National Park Service	Channel Islands National Park Recovery Strategy for Island Foxes on the Northern Channel Islands	2003

Table 5-2. Various planning documents that are incorporated into this Integrated Natural Resources Management Plan (Continued).

Authoring Agency	Title	Date
National Atmospheric and Oceanic Administration	Channel Islands National Marine Sanctuary Management Plan	2009
Bureau of Land Management	California Coastal National Monument Resource Management Plan	2005
California Department of Fish and Game	Marine Life Management Act Nearshore Fishery Management Plan	2002
California Department of Fish and Game	Marine Life Protection Act Master Plan for Marine Protected Areas	2008a
California Department of Fish and Game	California Aquatic Invasive Species Management Plan	2008b
California Department of Fish and Game	Abalone Recovery and Management Plan	2005
California Department of Fish and Game and California Environmental Protection Agency	Ocean Action Plan	2004
California Department of Fish and Game	Wildlife Action Plan	2007
State Water Resources Control Board	Marine State Water Quality Protection Areas, Areas of Special Biological Significance	2003
Regional Water Quality Control Board	Los Angeles Region Basin Plan	1994
Catalina Island Management	Catalina Island Conservancy Science Plan, Ecological Restoration Plan, and Education Plan	
Ventura County	Ventura County General Plan	
Los Angeles County	Los Angeles County General Plan	

Management Strategy

Objective: Collaborate where appropriate on regional plans that have an impact on the natural resources of San Nicolas Island.

Objective to Maintain Consistency with Other Plans

5.7.1 Consistency with Integrated Cultural Resource Management Plan

Specific Concerns

- Natural resources monitoring programs and the control and management of terrestrial invasive exotic plants have the potential to impact archaeological sites.
- Expanding pinniped populations cause the greatest impacts to archaeological sites that occur near marine mammal haul out locations.

Current Management

The Project Review Board and the Site Approval and Project Review Process codified in NBVCINST 11010.1 provide the primary planning mechanism for projects conducted by the Natural Resource program to be reviewed by other programs such as Cultural Resources. An Integrated Cultural Resource Management Plan (ICRMP) for NBVC is also being developed beginning in 2010. This ICRMP includes SNI within its planning footprint and is intended to provide strategic guidance to NBVC to support a conservation and stewardship program for historic and archaeological resources present on property owned or controlled by the Navy. The cultural resource conservation and stewardship program enables NBVC and SNI to comply with USDOD cultural resource Instructions such as USDODINST 4715.6 Cultural Resource Management, EOs such as EO 11593 Protection and Enhancement of the Cultural Environment, and cultural resource laws including but not limited to the American Antiquities Act, Archaeological Resources Protection Act, Archaeological and Historic Preservation Act, NHPA, and the Historic Sites Act. Cultural resource management activities encompassed within the ICRMP include access restrictions to archaeological sites and surveys of historic and archaeological resources.

Assessment of Current Management

In theory, the Project Review Board and the Site Approval and Project Review process will review all projects that may affect sensitive natural or cultural resources at SNI. However, in practice not all projects are submitted for review through the Project Review Board or are assessed through the Site Approval and Project Review Process. In particular, recurring projects such as invasive exotic plant control efforts are often not submitted each year to the Project Review Board because they are conducted on a

recurring basis and the scope and purpose of these projects does not change. Even though the scope and purpose of a recurring project such as invasive exotic plant control efforts does not change, the actual locations where treatment efforts are applied do change on an annual basis. Although most other programs would not need to review such a recurring project, the Cultural Resource program should review the project because treatment efforts have the potential to impact sensitive cultural resource areas and known archeological sites. There is a need for the Natural Resource Program to be more diligent in ensuring that projects that may affect sensitive cultural resources go through the Project Review Board on an annual basis in order to ensure that archaeological sites are not impacted by natural resource management activities. Considerations should also be made to ensure that cultural resource briefings are conducted, GIS files and maps of sensitive cultural resources are provided, buffer distances encompassing sensitive cultural resource areas are adhered to, and cultural resource specialists are available to provide oversight in the field for those Natural Resource projects that are not able to provide site specific information to the Project Review Board or the Site Approval and Project Review Process.

Management Strategy

Objectives and Strategies for Consistency with Integrated Cultural Resource Management Plan

Objective: Coordinate management activities between the cultural and natural resource management program when a natural resource impacts, or has the potential to impact, a cultural resource.

I. Continue to participate in the Project Review Board and the Site Approval and Project Review Process to ensure communication and coordination between the natural and cultural resource management programs when natural resource management program activities have the potential to impact sensitive cultural resources.

II. Coordinate with the Cultural Resource program when project proponents of natural resource projects that have the potential to impact sensitive cultural resources are not able to provide site specific information due to their need to identify unknown locations of plants or wildlife and subsequently monitor or control them.

A. The Natural Resource program may coordinate with the Cultural Resource program by participating in briefings concerning the locations of sensitive cultural resources, by obtaining GIS files and maps of known locations of sensitive cultural resources, by ensuring that buffer zones around sensitive cultural resource areas are adhered to, or by ensuring that a qualified cultural resource specialist is present when activities are being conducted.

III. Coordinate with Cultural Resources staff to develop and implement a plan to manage wildlife impacts to cultural resources to address the management of expanding wildlife populations that impact cultural resources.

A. Develop and implement a SNI Pinniped and ICRMP to reconcile potential conflicts between natural and cultural resource conservation and stewardship compliance requirements in order to ensure that an expanding pinniped population does not impact the integrity of archeological sites.

5.8 NEPA Compliance

Specific Concerns

- There is no formal protocol regarding when to include Installation Restoration in the NEPA process.
- There is no clear protocol on when to include outside agencies on projects, and how the NEPA coordination will occur.
- All NEPA processes need to dovetail with the Section 106 process.

Current Management

A Site Approval and Project Review Process (NBVCINST 11010.1, 04 June 2003) guides NEPA implementation and permitting procedures for project sponsors. The NBVC ED has primary responsibility for NEPA implementation. Responsibilities for NEPA implementation include:

- Ensuring each action proposal is reviewed in a timely manner;
- Completing and forwarding documentation for Categorical Exclusions (CE) and continuing action determinations to the action proponent;
- Coordinating consultation and document preparation with the proponent for actions requiring an EA or EIS;
- Assisting action proponents in development of an EA or EIS;
- Serving as a member of the Project Review Board (NBVCINST 11010.1);
- Forwarding EA and EIS documents to OPNAV via the chain of command; and
- Serving as a single point of contact with regulatory agencies while engaged in the NEPA process.

Results of project analyses are documented through each step of environmental review. The ED reviews all projects prior to implementation. Either the proponent organization environmental coordinator or an ED representative performs an initial review. If a planned project is determined to have the potential to adversely impact the environment, the proponent will generate a request for formal environmental analysis by the ED.

NEPA documentation would consist of either a CE or EA when determined that the proposed action would not require an EIS. The EA as defined in regulations is a concise public document that serves to:

- Provide sufficient evidence and analyses for determining whether to prepare an EIS or a Finding of No Significant Impact (FONSI);
- Aid the agency to comply with NEPA when no EIS is required; and
- Facilitate the preparation of an EIS when required (40 CFR 1508.9).

When it is deemed that an action may have a significant impact on the human environment, a detailed EIS is usually prepared as required by Section 102(2)(C) of the NEPA. Actions for which an EIS must be prepared include:

- Large dredging projects;
- Proposed major construction and filling of tidelands and/or wetlands;
- Establishment of major new installations, and/or major land acquisitions that will result in changed property uses;
- New sanitary landfills; and
- Disposal of biological or chemical munitions or pesticides or herbicides in a manner other than that for which they are authorized (OPNAVINST 5090.1C).

NEPA Mitigation Measures

Mitigation that is identified in a FONSI is a Class 1 “must fund” for environmental purposes. This provides a mechanism to fund mitigation included in NEPA documents (INRMP 2005).

Avoidance: Avoid adverse impacts on natural resources by not performing activities that would result in such impact. Confine construction to areas where no significant impact would occur to natural resources.

Limitation of action: Reduce the extent of an impact by limiting the degree or magnitude of the action. Minimize impacts of construction projects by arranging timing, location, and magnitude of actions so that they have the least impact on natural resources.

Restoration of the environment: Restore the environment to its previous condition or better. This could involve reseeding and/or replanting an area with native plants after it has been damaged by construction projects.

Preservation and maintenance operations: Design the action to reduce adverse environmental effects. This could involve actions such as monitoring and controlling pollution, contamination, disturbance, or erosion caused by construction projects that would impact natural resources.

Replacement: Replace the resource or environment that will be impacted by construction projects. Replacement can occur in-kind or otherwise, on-site, or at another location. This could involve creation of the same type or better quality habitat for a particular impacted fish or wildlife species or creation of habitat for another species.

Assessment of Current Management

The ED uses NEPA to ensure its activities (as described in this INRMP) are properly planned, coordinated, and documented. It also uses NEPA to identify issues associated with other organizations' projects, which affect SNI's natural resources, when it has the opportunity to review such projects.

An important offshoot of proper NEPA implementation is that projects are often enhanced by the effort. When natural resources managers understand mission/project requirements in terms of land features and requirements, they often not only offer more potential site options to mission or project planners but also offer alternatives to avoid future environmental conflicts.

Management Strategy

Objective and Strategies for NEPA Compliance

Objective: Conduct planning of mission activities having potential environmental effects by applying NEPA's requirements and policies to enhance the mission-related use and the protection of natural resources. Seek opportunities for streamlining environmental assessment procedures.

I. Continue to use NEPA documentation to guide specific projects and document choices.

- *A.* As far as possible, NEPA, BOs, and other environmental documentation should be as programmatic as possible so that subagreements tiered below these can be facilitated in a more timely manner.
  - *1.* Implement NEPA programmatically, such as for routine maintenance, in concert with the BA on Routine Maintenance, so that maintenance work can continue without delay.
- *B.* Define and identify measures for "no net loss" of military value, and seek agreement among resource and regulatory agencies on these measures during INRMP planning updates, NEPA review, and ESA consultations.

II. Continue to assess the environmental consequences of each proposed action that could affect the natural environment, and address the significant impact of each action through analysis, planning and avoidance.

- *A.* Continue to implement the site approval process NBVCINST 11010.
  - *1.* Determine a means to improve coordination between various budget processes and NEPA.
  - *2.* Both NEPA and other site approval processes should start concurrently.
  - *3.* Encourage consideration of indirect effects during project analysis. Effects beyond the immediate project footprint, such as lighting, noise, turbidity, increased truck traffic, etc., can negatively affect sensitive species.
  - *4.* If federally listed species or designated critical habitat is known to occur in the project area the site approval should address direct and indirect impacts to these resources. A determination of no effect should be concurred upon by the USFWS or NMFS.

B. Ensure that any proposed action that has the potential for physical impact on the human environment undergoes the NEPA process, unless it is excluded in a previous document.

1. Include new activities, substantive changes in continuing actions, specific actions, or adoption of programs, for example: routine grounds maintenance such as erosion control measures or the use of herbicides and pesticides.

2. Any ground disturbing activity needs to go through NEPA site review, including any new agricultural activity or any ripping to depths greater than what is currently done.

C. Through evaluation, including prior public comments, ensure that the appropriate level of NEPA documentation is prepared.

III. The NEPA planning process should facilitate project planning and routine maintenance work, including the consideration of potential mitigation. It should integrate project-specific plans with overall land use and natural resource management plans.

A. Integrate NEPA planning early with regular planning functions of each office.

1. Technical assistance should be provided by staff to support other offices, when needed, *before* and after a proposed action is submitted for NEPA review, giving guidance on: project design, site selection, and scope of work; development of reasonable alternatives, including alternative sites; and selection of appropriate mitigations so the proposal integrates mitigation from the beginning.

B. Regularly update the NEPA Instruction which clearly and simply outlines step-by-step procedures for the management and preparation of NEPA documents.

C. Update NEPA forms for project proponents, including the Site Approval Checklist, periodically to ensure consideration of all issues.

1. Provide list of pre-approved conservation measures or mitigation for project proponents to select from.

2. Reference appropriate environmental protection and mitigation policies from this INRMP. Also provide for creative and flexible mitigations.

3. Make available to project planners updated GIS maps of sensitive resources on the property to assist in evaluating potential impacts of proposed projects and in recommending appropriate mitigation opportunities.

D. Communicate directly with all affected parties during NEPA process to avoid misunderstandings and delays.

1. Keep a stakeholder contact list. Contact off-site interested and affected agencies and parties as soon as possible on projects with potentially significant environmental impacts, particularly if controversial.

a. If possible coordinate with regulatory agencies in the early stages of the planning process, so project designs and construction schedules can be developed to have the least impact on sensitive species. This will assist in avoiding potential loss of project funding and project delays.

IV. Follow up on mitigation measures proposed in NEPA documents in order to maintain a consistent relationship of trust with regulatory agencies and the public.

5.9 Stormwater Management

Background

While pollution entering the storm drains is usually from diffuse or nonpoint sources, the outfalls of storm drains represent a point source of discharge into the ocean. The federal CWA, as amended in 1987 (Section 402[p]), and the CZARA of 1990 (Sec. 6217) are the driving regulatory forces in addressing nonpoint source pollution from urban and stormwater runoff, as interpreted by the State Water Board in its Nonpoint Source Pollution Control Program policies (SWRCB 2004).

Stormwater discharge to navigable waters is prohibited unless a NPDES permit is obtained. The EPA has delegated responsibility for the NPDES program to the State Water Board. In turn, LARWQCB implements the program at the regional level. The CZARA requires EPA and the state to develop and implement management measures to control nonpoint pollution in coastal waters, which California has done through a procedural guidance manual produced by the CCC (1997). The relation of the CWA and CZARA programs is described in more detail in other sources (LARWQCB 1994,SWRCB 2004; CCC 1997).

A tiered approach is used by EPA and the State in implementing the stormwater permit program. Phase I requires NPDES permits for municipal storm sewers serving large and medium sized populations (greater than 250,000 or 100,000 respectively) and for stormwater discharges associated with industrial activity that is already permitted. Phase II addresses smaller municipalities, small construction sites, and became effective in 2002. The CZARA's requirements for management measures apply to those activities not covered by Phase I, such as construction activities on sites less than 5 acres (2 ha) and discharges from wholesale, retail, service, and commercial activities, including gas stations (SWRCB 1994).

The use of stormwater BMPs are recommended. EPA's management measures and BMPs for urban runoff address six source categories: developing areas; construction sites; existing development; onsite disposal systems; general sources; and roads, highways, and bridges (CCC 1997). Handbooks describing stormwater BMPs applicable for California are available for municipal, commercial /industrial, and construction BMPs (Camp Dresser and McKee *et al.* 1993; CASQA 2003).

Island watersheds are identified in the Los Angeles Regional Basin Plan for the Channel Islands Watershed Management Area and the following Beneficial Uses of island watercourses are identified: municipal supply, groundwater recharge, contact and noncontact water recreation, warm water habitat, wildlife habitat, and preservation of rare and endangered species.

Several high priority issues were identified in the 2005-2007 Triennial Review for the Channel Islands Watershed Management Area which will require Basin Planning resources (LARWQCB 2007). As in all watersheds, adopting TMDLs as Basin Plan amendments is required under the Consent Decree with an estimated resource need of 0.5 PY/TMDL. This is considered a currently funded activity. The ongoing Tiered Aquatic Life Uses (TALUs) Pilot Project (EPA's newest tool for providing more resolution to the beneficial uses of cold water and warm water habitat) may affect many watersheds in the region. Tiered Aquatic Life Uses are a way to rank the expected quality of aquatic beneficial uses and set biological goals for a wide variety of aquatic habitats. The key to effective TALUs is the combination of the biological condition gradient (BCG) and generalized stressor gradient (GSG). The BCG is defined as a predictable change in the aquatic community based on alterations (i.e. stressors) in its environment. For benthic macroinvertebrates, the BCG may consist of the presence of tolerant taxa vs. sensitive taxa, endemic vs. non-native taxa, organism condition, or ecosystem function/connectedness. Regardless, the goal is to define a gradient in biological response due to some external stressor to form the basis for assessing tiers of beneficial use conditions. The purpose of this TALU Pilot Project is to develop more tailored water quality standards (through beneficial use designations and associated biocriteria) to protect the biological communities of semi-arid coastal streams.

San Nicolas Island and Begg Rock are identified as Critical Coastal Area #57 in the SWRCB and CCC's Critical Coastal Area Draft Strategic Plan. The SNI was identified as such since its watersheds flow into an ASBS, which is a State Water Quality Protection Area. The draft strategic plan lists that there are no major efforts currently to implement nonpoint source management measures.

Specific Concerns

- Regulatory approach through storm water permits under the CWA has provided incentives for cooperative monitoring but also has required some expensive solutions.
- Runoff of pollution through stormwater is the primary means of delivery to nearshore waters. Storm drains are not connected to sewers or a sewage plant. Unless natural or artificial filtering systems exist, every contaminant in the storm drains or creek systems is delivered into the nearshore waters. This problem is a significant stormwater management issue. The impervious surfaces of developed areas, such as parking lots, roads, and buildings, reduce the natural filtering capability of the watershed and instead help pollutants wash off the "hardened" landscape (Center for Watershed Protection 2003).
- Waters surrounding SNI have been designated by the State as an ASBS for special water quality protection.

Current Management

The U.S. Navy (CNRSW) policy related to stormwater management is: "Develop, implement, and maintain current stormwater management plans, and comply with federal, state, and local regulations and permit conditions, as applicable." The Navy has coverage under two general stormwater permits: the statewide General Industrial NPDES Storm Water Permit and the statewide General Construction NPDES Stormwater Permit.

The Navy has a SWPPP (NBVC 2010) and a Storm Water Working Group for SNI. This SWPPP is written in accordance with requirements of the SWRCB Water Quality Order No. 97-03-DWQ and NPDES General Permit No. CAS000001 (General Permit) (NBVC 2010). The General Permit authorizes NBVC SNI to discharge storm water from the date the Navy submitted an NOI (17 March 1992).

The General Permit stipulates the essential elements that all facilities must consider and address in the SWPPP. The document contains two parts: (1) the SNI SWPPP, and (2) the Monitoring and Reporting Program Plan (MRPP). Both were updated to accommodate changes in industrial activities at the facility.

The storm water pollution prevention team at NBVC SNI is responsible for the following monitoring activities:

1. Non-storm water discharge visual observations (NSWDVO) to verify that non-storm water discharges have been eliminated;
2. Wet season sampling and observations to aid in evaluating the effectiveness of the SWPPP; and
3. Annual site inspections to assess compliance with the General Permit.

Dry season conditions are observed quarterly to identify potential illicit discharges. Wet season conditions are observed during the period October 1 through May 31. The storm water discharge visual observations (SWDVO) visually evaluate the quality of storm water discharged from each drainage area at NBVC SNI. Storm water samples are collected from two storm events during this time period.

Storm water samples are collected from three outfalls and are analyzed for pollutant parameters listed in the permit. Pollutant parameters are selected based on their potential to enter the storm water system from industrial activities that drain to each sampling outfall. Typical pollutant parameters include oil and grease, specific conductance, total suspended solids (TSS), and pH. Analytical results are submitted to LARWQCB as part of an annual report. Currently, water quality standards contained in the California Ocean Plan and California Water Quality Control Plan (Basin Plan)

are used as goals only and not as regulatory limits. Concentrations of routine and toxic pollutant parameters are also used to assess the effectiveness of in-place BMPs and to evaluate whether additional BMPs are needed. The results of annual sampling are used to indicate whether the additional BMPs have had an impact on pollutant parameter concentrations over time.

Effluent discharge (amount and concentration of potential contaminants) for the SNI Wastewater Treatment Plant is governed by a Waste Discharge Requirement issued by the LARWQCB. The primary method of wastewater disposal is via evaporation from a series of three oxidation ponds. Irrigation is the secondary method of disposal. Treated wastewater is sprayed over a six-acre (2.4 ha) land area, which is restricted and off-limits to personnel.

Expectations are being built into the stormwater permitting programs that "adaptive management" should occur - where feedback from annual monitoring results can be used to adapt the monitoring effort and the Storm Water Management program to be more useful. Municipal Permits, for example, requires co-permittees to collaborate with each other to develop a Long-Term Effectiveness Assessment. "Pollutants of Concern" can change over time, with some being dropped and others added as monitoring results indicate their importance.

The waters surrounding SNI are part of the Southern California Coastal Water Research Project (SCCWRP), the largest regional water quality monitoring program of its kind in the country. Using standardized monitoring procedures, the project should help with certain monitoring and evaluation needs, though only on five-year increments (1998, 2003, 2008, etc.).

Assessment of Current Management

The present condition of the SNI's water appears to be good with no impairments identified (LARWQCB 2007).

San Nicolas Island evaluates the effectiveness of its storm water program by evaluating whether the overall monitoring program is (1) achieving its objectives, which include ensuring that storm water discharges are in compliance with the General Permit, (2) ensuring that management practices to control pollutants are evaluated and revised to meet changing conditions, (3) assisting in the implementation of the SWPPP, and (4) measuring the effectiveness of BMPs in preventing pollutants from entering storm water discharge.

SNI itself lacks a formal mechanism for addressing upslope problems like urban runoff and watershed protection. Implementing the concept of LID to maintain pre-development hydrologic conditions will require guidance documents and training programs, such as for government planners and designers.

The design of new development (or retrofitting existing development) to control stormwater runoff is the subject of LID practices, which are becoming increasingly popular in the U.S. and other countries. The SWRCB defines LID as "storm water management practices for land development that are conducted to minimize impacts on the natural environment; Low Impact Development techniques include conserving natural systems and hydrologic functions by managing rainfall at the source using design techniques that infiltrate, filter, store, evaporate, and detain runoff" (SWRCB 2010). The 2007 Municipal Permit requires the co-permittees to place LID requirements as BMPs on priority development projects within their jurisdictions. BMPs, for example, would route runoff from impervious areas to pervious sites and use permeable surfaces for low traffic areas to help infiltrate into the soil.

The EPA has developed a website[1] for LID Strategies and Tools for NPDES Phase II Communities to assist stormwater Phase II communities integrate LID strategies into their compliance programs. The NAVFAC Atlantic has a LID Design Manual developed in cooperation with the Low Impact Design Center.

1. Available at: http://www.lowimpactdevelopment.org/lidphase2.

Improvements in monitoring strategy are being identified through new stormwater permits, Urban Runoff Management Plan updates (by jurisdiction and watershed), external evaluations, and new research. Monitoring sites have tended to be selected for the purpose of compliance monitoring rather than for effectiveness monitoring of specific BMPs or for trend monitoring of different streams or their reaches over time. Information useful to detect stormwater pollutant sources (e.g. forensic monitoring) and to evaluate runoff BMPs could be derived from expanding current monitoring programs from their compliance orientation to effectiveness and trend purposes.

Management Strategy

Objective and Strategies for Storm Water Management

Objective: Reduce and minimize stormwater pollutants harmful to the ocean ecosystem from entering SNI waters.

I. Encourage the further development and implementation of new or existing stormwater pollution prevention and water quality protection efforts throughout SNI watershed.

A. Create a Partnership to facilitate Cross-Jurisdictional Implementation and encourage the integration of regulatory and non-regulatory programs. Develop formal coordination arrangements as needed.

B. Promote runoff BMPs that support stormwater pollution prevention and reduction.

1. Explore the opportunity for better use of natural and artificial wetlands as upslope filters to trap runoff sediment and pollutants.

2. Support LID practices to mimic natural runoff patterns.

a. Facilitate opportunities to address runoff at the sub-basin scale rather than site or project scale.

b. Support educational tools such as webcasts and podcasts that teach about how communities can more effectively manage rainwater where it falls. “Green” streets and landscapes beautify, preserve water quality, minimize urban heat island effect, and reduce a community’s carbon footprint. Other practices include rain gardens, curb cuts, bioswales, and green roofs to address stormwater runoff. An example of an audio program is available from the Office of Wetlands, Oceans, and Watersheds.[1]

C. Actively participate in the RWQCB's TMDL processes.

D. Develop an improved training program for appropriate government employees.

1. Support regular workshops on the need, design, and implementation of BMPs.

2. Train selected employees to train others.

3. Provide training on LID to maintain pre-development hydrologic conditions.

E. Encourage agencies to improve relevant administrative and planning practices.

1. Ensure that stormwater quality controls are considered during the site planning and design phase and not tacked on after the fact.

2. Examine location and evaluate need to reposition outfalls in relation to effects on sensitive habitats.

F. Target monitoring efforts to evaluate the effectiveness of BMPs and trends in water quality of sub-basins leading into the ocean. Perform adaptive management.

1. Available online at: http://epa.gov/owow/podcasts.

1. Position monitoring stations at key sites within sub-basins to better track "hot spot" sources of stormwater pollution. Assess results of dry weather and wet weather monitoring.
2. Evaluate the effectiveness of the applied urban runoff BMPs through the use of a targeted effectiveness and trend monitoring in the watershed.
3. Continue identifying sources of improper discharges through dry season stormwater monitoring.
4. Implement a Biological Indicator Development Program to better evaluate the effects of runoff on the nearshore ecosystem.
5. Re-evaluate the design and use of BMPs based on the results of the monitoring program.

5.10 Remediation of Contaminated Sediments

Specific Concerns

- Contaminated sediment can also lead to bioaccumulation and biomagnification of sediment contaminants in organisms up the food chain. Bioaccumulation is the process in which biological uptake and retention of contaminants in the tissues of an organism results from feeding, contact with the sediments and overlying water, or some combination of these. In this process, concentrations of many contaminants can biomagnify in body tissue concentrations as they move up through the food web from small invertebrates to fishes, birds, and even to humans.
- The effects of bioaccumulation on migratory birds is a concern, including for listed species like the brown pelican and western snowy plover. Fish and wildlife can be affected by direct mortality, or at lower contamination levels by sublethal effects on reproduction and survivability of young.
- Certain sportfish species are known to accumulate PCBs and mercury at levels that could pose health risks for consumers.

Current Management

Cleanup or remediation of polluted sediment is regulated by several state and federal statutes. The primary laws that apply, or may apply in some instances, are summarized in Appendix B. The most important of these is the Porter-Cologne Water Quality Control Act, which forms part of the California Water Code.

Similarly, several different federal, state, and local governmental or regulatory agencies have official responsibility for issues involving contaminated sediments, as shown in Table 5-3. The lead agencies are the RWQCB, EPA, and USACE. The Navy has major roles in the process.

Table 5-3. Federal and State Statutes affecting management of contaminated sediment.

Federal Statutes	State Statutes
Clean Water Act	California Water Code, Division 7
Rivers and Harbors Act of 1899	California Health and Safety Code
Marine Protection, Research, and Sanctuaries Act	California Fish and Game Code
National Environmental Policy Act	California Environmental Quality Act
Fish and Wildlife Act	California Food and Agricultural Code
National Historic Preservation Act	California Harbor and Navigation Code
Endangered Species Act	California Coastal Zone Management Act

The Navy's policy on sediment cleanup where several responsible parties are involved is described in a statement from the CNO to the Commander, NAVFAC (Navy/Marine Corps Installation Restoration Policy on Sediment Investigations and Response Actions [08 February 2002]). The policy specifies that the source must be identified and controlled before cleanup, the cleanup must be risk-based and have site-specific cleanup goals, and the monitoring criteria for any monitoring plan must be established before the first sample is collected. All sediment investigations and response actions must be directly linked to Navy contaminated releases. Directly linked means that the sediment contamination is scientifically connected to a Navy Installation Restoration site. This Policy requires that:

1. All sources shall be identified to determine if the Navy is solely responsible for the contamination. Source identification is very important in determining the Navy's cleanup responsibility and if a site will be recontaminated after cleanup is complete. The extent of the Navy responsibility shall be determined. Therefore, the project team will generate a Watershed Contaminated Source Document (not a watershed investigation) if there are potentially other non-Navy sources contributing to the contamination of the sediment. All sources of Navy and non-Navy contamination at the site should be identified.
2. All investigations shall primarily be linked to a specific Navy CERCLA/RCRA site. If it is established that only Navy activities contribute sources to a water body then investigating that water body using a watershed approach may be beneficial and cost effective. Investigating (collecting and analyzing samples) entire watersheds that contain non-Navy sources is not an appropriate use of cleanup funds. Any proposed broad watershed investigations with non-Navy sources and potential cost sharing with non- Navy entities must be approved by the CNO (N45) Office.
3. All sediment investigations and response actions shall be consistent with Navy polices on risk assessment and background chemical levels.
4. Sediment cleanup goals shall be developed based on site-specific information and shall be risk-based. If unacceptable risk to human health and/or the environment is identified, risk-based sediment cleanup goals shall be developed using site-specific information. The cleanup goal must be risk-based and achievable. Ecological screening values must not be used as cleanup goals nor shall cleanup values below background chemical levels be used. Development of cleanup goals should include, but not be limited to, land use and bioavailability.
5. The Navy shall not clean up contamination from a non- Navy source where the Navy has not contributed to the risk in sediments. The Navy will not clean up a site before the source is contained. Any potential re-contamination by non-Navy sources shall be documented. Only sediment sites with known contamination from Navy sources that demonstrate unacceptable risk will be remediated. All Navy sources shall be contained before sediment response actions are initiated. The information provided in these reports, documents that the Navy has cleaned up its responsibility.
6. A monitoring plan with exit strategies shall be developed before collecting the first monitoring sample.

As the lead regulatory agency, the LARWQCB fulfills its two primary functions in dealing with contaminated sediment issues:

- To ensure reasonable protection of beneficial uses; and
- To ensure the prevention of nuisance conditions resulting from excessive discharges of waste.

The SWRCB adopted a Statewide Consolidated Toxic Hot Spot Cleanup Plan on 18 June 1999. The Regional Board has the authority to take enforcement action against those who violate its waste discharge requirements or discharge prohibitions as they apply to sediment contamination. The three primary enforcement remedies available to the Board are: cease and desist orders; cleanup and abatement orders; and administrative civil liability monetary penalties.

Assessment of Current Management

The problems associated with remediation of contaminated sediment are obviously complex and most remediation methods themselves are costly. The following management objective and strategies are recommended to increase the efficiency of the remediation process.

Management Strategy

Objective and Strategies for Remediation of Contaminated Sediments

Objective: Avoid and minimize impacts from contaminated sediment to recreational and commercial water contact users.

I. Collect and distribute data on sediment contamination.

A. Continue to participate in the SCCWRP's Bight sampling program.

B. The Navy should participate in RWQCB sediment workshops to discuss the means of determining clean levels or targets for sites.

C. The Navy should continue to update source control programs.

D. The Navy should update point-source pollution prevention plans for facilities.

II. Minimize risks to recreational and commercial water contact users.

A. Characterize bacteriological water quality at selected locations around SNI.

1. Monitor indicator bacteria (total and fecal coliform) to determine compliance with state recreational water standards or other relevant criteria.

2. Monitor and evaluate temporal trends in indicator bacteria at selected locations.

B. Minimize the exposure of recreational and commercial users to pathogens.

C. Design and implement management practices to prevent the introduction of pathogens to SNI waters.

III. Minimize risks to the SNI's wildlife species.

A. Conduct autopsies within 24 to 48 hours on birds found dead in the SNI area.

IV. Support the protection of the public from health risks associated with consuming seafood harvested in SNI's nearshore waters.

A. Support monitoring trends in contaminants determined to be present in seafood organisms at levels that may pose significant risks to human consumers.

5.11 Oil Spill or Hazardous Substance Prevention and CleanUp

Specific Concerns

- Marine terminal (fuel barge) operations at SNI include the routine transfer of between 200,000 and 250,000 gallons (760,000 and 950,000 liters) of jet fuel (JP-5) every fuel delivery. JP-5 jet fuel represents the largest quantity of hazardous materials stored at SNI and the associated fuel barge operations represent the highest potential for a release of a hazardous substance at SNI.
- Cumulative effects of small, medium, and large oil spills from boats, personal watercraft, and ships can contaminate SNI waters and affect natural resources.
- Coordinated planning for oil spill cleanup activities should be integrated with conservation priorities of this INRMP.

- The collection and maintenance of ecological information required by OPNAVINST 5090.1C (Chapter 22) are essential to pre-incident planning on behalf of the Navy's Regional Environmental Coordinator.
- There is a need to incorporate planning for Natural Resources Damage Assessment (NRDA) under both federal and state oil spill prevention regulation, as well as to establish a quantitative baseline to support natural resources management decisions, habitat mitigation and enhancement planning, and sustainability planning.
- Oil spills most notably affects marine birds and marine mammals, but also exerts damaging effects on plankton and other organisms either directly or indirectly through habitat damage. The size of an oil spill doesn't necessarily correlate with the amount of damage it can do. Even small spills can have big consequences for birds if the oil contaminates an area where large numbers of seabirds are rafting or foraging (Bunn *et al.* 2008).

Background

Federal Regulatory Framework

The federal Water Pollution Control Act of 1972 (33 USC 1251, *et seq.*), as amended by the CWA of 1977, authorizes the President, in the case of an oil or hazardous substance release, to take any action necessary to mitigate damage to the public health and welfare; including, but not limited to fish, shellfish, wildlife, public and private property, shorelines and beaches. Natural Resource Trustees are authorized to recover damages for injury to, destruction of or loss of natural resources resulting from a discharge or the substantial threat of discharge, of oil into navigable waters.

The CWA prohibits spills, leaks or other discharges of pollutants into waters of the U.S. in quantities that may be harmful, which includes discharges of pollutants that: (1) violate applicable water quality standards; (2) cause a film or sheen upon or discoloration of the surface of the water or adjoining shorelines; or (3) cause sludge or emulsion to be deposited beneath the surface of the water or upon adjoining shorelines.

The Oil Pollution Prevention Act of 1990 amended the CWA to expand oil spill prevention activities, improve preparedness and response capabilities, and ensure that companies are responsible for damages from spills. The USCG is the lead agency for oil spill prevention and response, and is authorized to direct state and local agencies in controlling pollution in bays and coastal waters.

Hazardous substances other than oil are addressed by the CERCLA (42 USC 9601, *et seq.*), which authorizes Natural Resource Trustees to recover damages for injury to, destruction of or loss of natural resources resulting from the release of a hazardous substance.

NOAA is assigned responsibility for NRDA from spills, and the Navy has adopted NOAA procedures for damage assessment (15 CFR 990). Similarly, the USDOI is in charge of damage assessment for hazardous substance spills under EO 12580. The baseline condition of the natural resources and services that would have existed had the oil or hazardous substance release not occurred is estimated using historical data, reference data, control data or data on incremental changes, alone or in combination, as appropriate. Navy guidance (OPNAVINST 5090.1C) suggests that this information may be obtained from INRMPs, NEPA Documents, or special studies.

NRDA and Ephemeral Data Collection Plan

U.S. Department of Defense guidance (USDODINST 4715.3) states that "All USDOD Components shall develop and promulgate criteria and procedures for assessing natural resource damage claims in the event natural resources under USDOD control are damaged [injured] by oil or a hazardous substance released by another party." Navy requirements (OPNAVINST 5090.1C), however, go beyond USDODINST 4715.3 and apply to natural resource injury occasioned by oil or hazardous substance releases from both USDOD and non-USDOD sources.

Where an oil spill, regardless of source or physical location, injures or threatens to injure natural resources within Navy management or control, NOAA NRDA procedures serve to guide Navy activities in the mitigation, assessment and collection of natural resource damages occasioned by the spill. In the case of other hazardous substance releases, the USDOI has established other types of natural resource damage assessment regulations. One method calculates resource damages called a Resource Equivalency Analysis (REA), also known as Habitat Equivalency Analysis (HEA), is the most common method used in NRDA cases nationwide. It has been endorsed by the courts on two occasions. The injury is assessed in terms of degree (percent of baseline injured), duration (years until recovery), and size (number of acres, stream miles, birds, etc.). A trajectory estimating the recovery to baseline is also estimated. The injury may be described in terms of lost acre-years or stream mile-years or bird-years of lost ecological services. The benefits of a restoration project are quantified in similar terms: degree of benefit (e.g. percent services per unit area), duration of the project, and trajectory of the benefits over time. With this information, the size of the project is scaled until the benefit of the project is equal to the injury. The final step is to cost out the project. This cost becomes the measure of damages.

The baseline assessment compiled prior to a spill becomes essential to both pre-incident planning for response, as well as this post-incident assignment of damages. This baseline ecological information is required under OPNAVINST 5090.1C, Chapter 22 on behalf of the Navy Regional Environmental Coordinator. Baseline data specifically includes this INRMP.

NAVFAC Southwest has developed an Ephemeral Data Collection Plan in support of NRDA (Robilliard *et al.* 1997). Immediately during and after a spill, data will be collected in order to evaluate the injury. Examples include macro invertebrate surveys, water and sediment samples, and vegetation surveys. Following federal guidelines, this is often done cooperatively with the responsible party, as well as with fellow trustee agencies. The NAVFAC plan identifies specific locations, methodologies, and responsibilities for data collection.

State Regulatory Framework

The OSPR is responsible for protecting California's natural resources by preventing, preparing for, and responding to spills of oil and other deleterious materials, and through restoring and enhancing affected resources. The OSPR was formed after the Exxon Valdez oil spill in 1989, and the spill off of Huntington Beach by the American Trader in 1990. These events inspired the California Legislature to enact legislation in 1990 called the Lempert-Keene-Seastrand Oil Spill Prevention and Response Act. The Act also gave the State Lands Commission certain authority over marine terminals. The OSPR's responsibilities under the Act are:

- Development of contingency plans for the protection of fish and wildlife
- Establishment of rescue and rehabilitation facilities
- Establishment and funding of a network of rescue and rehabilitation facilities, known as the Oiled Wildlife Care Network
- Assessment of injuries to natural resources from a spill
- Development of restoration plans to compensate for adversely affected wildlife resources and habitats.

Both the federal and state statutes (Oil Pollution Prevention Act 1990 and Senate Bill 2040) were enacted in consequence of the catastrophic oil spills of 1989, and both required contingency planning for both state and federal governments. The USCG and CDFG-OSPR agreed to joint preparation of contingency plans through co-chairing the three Port Area Committees for Contingency Planning: USCG Port Areas for San Francisco, Los Angeles/Long Beach, and San Diego.

The OSPR's Resource Assessment Program conducts NRDA of pollution events that result in significant injuries to wildlife and/or habitat. The goal of OSPR's NRDA program is to quantify the damages, to seek compensation from the responsible parties, and to both restore the injured resources and compensate the public for the lost interim ecological benefits and uses of these resources.

The OSPR have developed a California Wildlife Response Plan (CDFG and OSPR 2005) to augment the ACP. The California Wildlife Response Plan details the Wildlife Operations Branch purposes, goals, objectives, responsibilities, and structure. The Wildlife Operations Branch is in the Operations Section of the Incident Command System for oil spill response. The Wildlife Operations Branch structure needed in California and detailed in this plan is expanded beyond that described in the USCG Incident Management Handbook. The CDFG normally leads wildlife response during a spill in California.

Current Management

San Nicolas Island's storage and transfer operations have the potential for a discharge of oil onto land or into navigable waters that could cause substantial harm to the environment, including injury to fish and wildlife and sensitive areas. Operational efficiency and safety of personnel and equipment, as well as Federal, State, and Navy regulations require that a plan exist to effectively respond to oil and hazardous substance spills. Oil and hazardous substance spill prevention and response planning requirements include the NCP, ACP, SPCC Plan, Federal FRPs, State of California Oil Spill Contingency Plan, U.S. Navy Instructions, Additional Emergency Response Planning, and an ICP.

The National Contingency Plan. The CWA and CERCLA, as amended, required that federal agencies make plans for emergency response to spills of oil and hazardous substances for which they are responsible. To comply with these Acts, the EPA has published Title 40 CFR Part 300, The National Oil and Hazardous Substances Pollution Contingency Plan, commonly referred to as the NCP (NOLF SNI 2006b). The Final Rule for 40 CFR Part 300 was published on 15 August 1994 with an effective date of 17 October 1994.

Area Contingency Plan. The Oil Pollution Prevention Act of 1990 and EO 12777 require that Area Spill Contingency Plans be developed in accordance with the National Response Policy. The policy also requires that a pre-designated FOSC be assigned to ensure effective and immediate removal of a discharge of oil or hazardous substances (NOLF SNI 2006b). The USCG designates FOSCs for the coastal zone of the U.S., and the EPA designates FOSCs for the inland zone. The COTP, Los Angeles-Long Beach, has been pre-designated to carry out the duties of the FOSC for the coastal areas of southern California between San Louis Obispo and Orange County. San Nicolas Island operates within the guidelines of the USCG, EPA, and the State of California under the Los Angeles/Long Beach ACP published in January 2000 (NOLF SNI 2006b).

Spill Prevention Control and Countermeasure Plan. The EPA's Oil Pollution Prevention Regulations address non-transportation related facilities. Title 40 CFR Part 112 requires facilities to have a fully prepared and implemented SPCC Plan. These plans are to establish spill prevention procedures, methods, and equipment requirements for non-transportation related facilities with: (1) total aboveground, non-buried, oil storage capacity greater than 1,320 gallons (5,000 liters), including only those containers of oil 55 gallons (208 liters) or greater; or (2) underground, buried, oil storage capacity greater than 42,000 gallons (160,000 liters) (NOLF SNI 2006b). Facilities meeting these criteria and because of their location, that could reasonably be expected to discharge oil into navigable waters of the U.S. or adjoining shorelines, require SPCC plans (NOLF SNI 2006b). Based on these criteria and operations, SNI must have a SPCC Plan.

Federal Facility Response Plans. In response to the Oil Pollution Prevention Act of 1990, the EPA issued revised rules in 40 CFR Part 112, Oil Pollution Prevention and Response; Non-Transportation-Related Facilities. The Final Rules require an FRP be prepared and submitted to the EPA Regional Administrator for any non-transportation-related facility that could reasonably be expected to cause substantial harm to the environment should a spill occur (NOLF SNI 2006b). The FRP requirements in the EPA Final Rules apply to SNI because it transfers oil over water and has an oil storage capacity greater than 42,000 gallons (160,000 liters) and a discharge could be expected to cause substantial harm to fish and wildlife and sensitive environments on or around the facility (NOLF SNI 2006b). San Nicolas Island is also classified as a MTR facility because it is capable of transferring oil to or from a vessel with a capacity of

250 barrels or more and it could be expected to cause significant and substantial harm to the environment by discharging oil into or on the navigable waters, adjoining shorelines, or exclusive economic zone of the U.S. (NOLF SNI 2006b). Therefore, the Final Rule issued by the USCG rules in 33 CFR Part 154, Facilities Transferring Oil or Hazardous Material in Bulk, apply to SNI and a response plan must be prepared to meet these requirements (NOLF SNI 2006b).

State of California Oil Spill Contingency Plan. Title 14 of the California Code of Regulations gave the OSPR authority to require marine terminal facilities to submit oil spill contingency plans. San Nicolas Island must prepare and submit a contingency plan consistent with these requirements. The SNI ICP has been prepared to include requirements of the State of California and Title 14 CCR, Section 817 and Title 2 CCR, Division 3, Chapter 1, Article 5 regulations concerning Oil Spill Contingency Plans and Marine Facility Operations Manuals (NOLF SNI 2006b). The SNI Emergency Response Action Plan, also known as *The Red Plan*, provides the information for and serves as a Response Manual (NOLF SNI 2006a). Additional specific response information and procedures can be found in the various Annexes of the SNI Oil and Hazardous Substance ICP. In addition, Title 2 CCR, Division 3, Chapter 1, Article 5 requires an Operations Manual for the mooring where fuel is transferred at SNI. The Operations and Maintenance Manual, Final Revision 2, for NBVC was prepared to address this planning requirement (NOLF SNI 2006b). The Operations and Maintenance Manual, Final Revision 2, for NBVC was submitted to the USCG and State of California and approved on 26 July 2005.

U.S. Navy Instructions. Government facilities must ensure compliance with the Oil Pollution Prevention Act of 1990 and Federal regulations in response to EO 12088 (compliance with applicable pollution control standards, 1978) and 12856 (planning, EPCRA, and pollution prevention requirements, 1991). San Nicolas Island is owned and operated by the Navy. In accordance with the OPNAVINST 5090.1C (series) - Environmental Protection and Natural Resources Manual, Naval facilities will pursue the protection and enhancement of the quality of the environment by adhering to all applicable regulatory requirements (NOLF SNI 2006b). Facility Response Plans and SPCC Plans will be properly developed, submitted, and maintained by each installation required to do so. Any State requirements will also be met in facility response planning. San Nicolas Island is also expected to address Spill Contingency Planning as part of the Regional Environmental Coordinators Disaster Preparedness Plan for their geographical areas of responsibility (NOLF SNI 2006b). San Nicolas Island complies with the requirements in these Instructions.

Additional Emergency Response Planning. Facilities that handle or store hazardous substances, the release of which could endanger health and human safety and adversely impact the environment, must comply with additional Federal regulations that govern emergency planning, notification, and response. These requirements are part of the RCRA, CERCLA, and EPCRA regulations contained in 40 CFR Part 264, 40 CFR Part 302, and 40 CFR Part 355, respectively. The OSHA also has regulations governing emergency response and planning. Applicable requirements contained in 29 CFR Part 1910 are addressed in the SNI Oil and Hazardous Substance ICP (NOLF SNI 2006b).

Integrated Contingency Plan. On 05 June 1996, the NRT issued a FR Notice on ICP Guidance (NOLF SNI 2006b). It intended to provide a mechanism for consolidating multiple plans that facilities prepare to comply with various regulations into one functional emergency response plan or ICP. The SNI Oil and Hazardous Substance ICP was prepared to meet all requirements as an ICP, as defined by the NRT (NOLF SNI 2006b). Specifically, the SNI ICP for Oil and Hazardous Substance Spill Prevention and Response is an operational, single-source document designed to meet the combined regulatory requirements for an EPA FRP, EPA SPCC Plan, a USCG Response Plan for Oil Facilities (MTR FRP), and a State of California, OSPR Oil Spill Contingency Plan. The SNI ICP for Oil and Hazardous Substance Spill Prevention and Response also addresses the emergency planning, notification, and response actions directed by the RCRA, CERCLA, EPCRA, and the OSHA. The SNI ICP for Oil and Hazardous Substance Spill Prevention and Response is also consistent with the NCP and the Los Angeles/Long Beach ACP.

Assessment of Current Management

Natural Resource program staff at SNI has coordinated with the USCG and their partners in meetings and has provided GIS layers of SNI's sensitive coastal areas during the revision of the Los Angeles/Long Beach ACP (M. Ruane, *pers. comm.*, 2010). Natural Resource Program staff will continue to provide current and updated information for inclusion into the Los Angeles/Long Beach ACP.

Recent SNI surveys could also be integrated into NRDA data collection study design, in order to improve the quantification of baseline status of natural resources in the event of a spill, and manage any Navy liabilities in such as case.

Management Strategy

Objective and Strategies for Oil Spill and Hazardous Substance Prevention and Cleanup

Objective: Prevent spills of oil and other hazardous substances, and ensure the effectiveness of prevention and response planning.

I. Continue to implement the SNI ICP for Oil and Hazardous Substance Spill Prevention and Response.

II. Continually enhance oil and hazardous substances spill response capabilities through equipment procurement, training, and participation in drills and area exercises, and continue active membership in the Safety and Area Contingency Planning Committee.

A. Continue to test the local ACP with annual table-top exercises and periodic drills.

B. Continue spill response, regardless of its source, in partnership with the USCG in accordance with the existing MOU between the USCG and Navy.

III. Continue to integrate the protection priorities of this INRMP into contingency spill response and NRDA planning.

A. Continue to update GIS layers of natural resources to support preparedness planning.

B. Continue to integrate baseline ecological surveys into preparedness planning.

C. Integrate invasive exotic species response planning with oil spill contingency plans.

5.12 Cumulative Effects

Specific Concerns

- As in other ecosystems, significant piecemeal habitat loss and fragmentation continues at SNI, and species continue to be listed, despite the intent of cumulative effects analysis under NEPA and other laws.
- Recent court cases have highlighted the need to analyze climate change in a consistent manner.
- Despite the obligation of agencies to quantify the effects of projects from a cumulative perspective, we are technically unable to do this because it entails a need to quantify connections among species and among habitats, and between the proposed project and all past, present, and reasonably foreseeable future actions at a site.
- There is no mechanism to ensure the quality of discussion on cumulative effects in environmental documents, especially for projects that are small but that are repeated on a wide scale. There is no way to identify at what point a loss becomes significant and at what scale of analysis.

- Incomplete or inadequate information sharing among agencies makes it difficult for project proponents to summarize past actions.

Current Management

Under NEPA, cumulative effects are those that result from the incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions regardless of which agency (federal or nonfederal) or person undertakes those actions.

The definition of cumulative effects differs under NEPA than under the ESA. Under NEPA, cumulative effects are those that result from the incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions regardless of which agency (federal or nonfederal) or person undertakes those actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR 1508.7). Under the ESA, cumulative effects include the effects of future state, tribal, local, or private actions that are reasonably certain to occur in the action area considered in a biological assessment or opinion.

The definition under the ESA is narrower. Cumulative effects include the effects of future state, tribal, local, or private actions that are reasonably certain to occur in the action area considered in a biological assessment or opinion. Future federal actions that are unrelated to the proposed action are not considered because they require separate consultation pursuant to Section 7 of the ESA (USFWS and NMFS 1998). Usually, the NEPA/CEQA cumulative effects analysis is taken and applied to the narrower ESA definition.

Potential cumulative effects from SNI projects include:

- Habitat conversion, loss, fragmentation, or degradation.
- Habitat degradation for birds with projects that increase boat traffic.
- Increased risk of exotic species invasions with increased maritime traffic or other activities that act as vectors of invasive species.
- Increased risk to water or air quality.
- Increased disturbance of birds using shoreline areas.

Individual projects may have little measurable ecological effect beyond the project footprint. However, dozens of similar projects could measurably change sediment erosion and deposition patterns, organic matter production and movement, as well as affect types and extent of habitat. Modeling of cumulative impacts requires this quantification of links between habitat "quality" and biological resource use, and these are generally poorly understood. For example, the cumulative effects of armoring on habitat functions other than resource use are not predictable at present, such as changing longshore drift velocities and lowering of the beach profile such that organic deposition on beaches is altered, as well as nutrient flux from sediments (Thom *et al.* 1994).

Assessment of Current Management

NEPA and ESA both fail to provide means to ensure the proper consideration of cumulative effects.

Congress passed NEPA out of concern that the nation's limited natural resources were being lost in "small but steady increments" (S. Rep. No. 296, supra note 2, at 5, as cited in Thatcher 1990). However, the law provides no mechanism to ensure the proper consideration of cumulative effects, with the quality of the analysis dependent on the author of the environmental documentation. Typical cumulative effects sections in environmental documents are brief and vague, and they are recycled from report to report (Parry 1990).

Management Strategy

Objective and Strategies for Cumulative Effects

Objective: Minimize adverse cumulative effects on habitats and species of the SNI ecosystem through avoidance, minimization, and collaborative partnerships and planning.

I. Standardize the format by which cumulative effects are discussed in environmental documentation (Parry 1990; IPCC Working Group II 2007).

A. Documentation should be presented at different hierarchical scales that are standardized to the extent possible from lowest to highest scales, such as by inlets, the island as a whole, SCB, state of California, or the marine mammal or seabird migratory routes.

B. Ensure climate change and sea level rise scenarios are considered using a standardized range of possible outcomes over 50-100 years or other defined time period.

C. Ensure standardization of the habitat classification system to be used in cumulative effects documentation.

D. The assessment should provide a check on the fragmentation and loss of connectivity among remaining habitats.

E. The assessment should provide a check on the minimum size of viable habitat parcels, using management indicator species to define "viable" parcels.

F. The format should support an information base on local extirpations or declines of species at risk, both listed and others of concern, so that additional effects to these species from a project can be more easily reported upon.

II. Properly bound the spatial and temporal extent of projects, such that all other projects that overlap in time and space are considered.

A. Geographic boundaries of a proposed action should be defined by actual effects, not administrative or ownership boundaries.

B. The immediate geographic boundary of an analysis should be expanded until trends show that project effects diminish sharply.

C. Identify crucial agents of connection or interaction between habitats that may be affected by projects, such as water/watershed, sediment movement, animal movement, and wind transport.

D. If information is not available, such as a project site is known but no other supporting engineering or natural resource data, use data from this Plan to support the analysis.

III. Once a standardized format is established, make the information accessible to project proponents and agencies to update and include in cumulative effects documentation.

IV. Support research to improve the adequacy of cumulative effects analysis at predicting when habitat or species effects become significant.

A. Promote research on connections among habitats and species, and the relationship between habitat "quality" and resource use.

B. Support research on the effects of habitat fragmentation, using indicator species.

C. Support research on the minimum size and proximity of habitat parcels as viable habitat for animals of different sizes and dispersal capabilities.

V. Develop means to mitigate for cumulative effects.

5.12.1 Shoreline Construction

This section addresses construction activity and other disturbance in the shoreline environment. The types of activities addressed in this section include disturbance related to construction and maintenance of structures such as piers, docks, and wharves in the tidal zone, and roads, bridges, and buildings in the supratidal zone.

Specific Concerns

- Current engineering of shoreline structures does not effectively consider habitat values of alternative designs. Current "rule of thumb" guidance for construction buffer zones from the CCC may be inadequate for protecting habitat values, especially for nesting colonies. A need exists for optimal sizes and types of buffers that effectively prevent disturbance to different species of marine mammals or birds at critical time periods. Increased lighting may make otherwise high value habitat unusable for some species. Night lighting may increase vulnerability of nesting birds to predation. Sensitive plants may be affected by night lighting as it may disrupt photosynthetic processes. Effects of night lighting on wildlife are difficult to study and to prove, but the sensitivity of the resource merits further study and that a cautionary approach to use of lighting be taken.
- Effects of shoreline structures can go unmitigated due to lack of effects of the structures on adjacent habitats by modifying sediment transport currents. Construction of new or extended roads adjacent to the shore can cause loss of wetlands or wetland functions through sedimentation and blockage of tidal action. New or widened bridges can cause sedimentation of wetlands or alter the natural drainage patterns that affect wetlands.
- Shoreline areas have values that need protection: (1) high tide refugia for birds, (2) habitat for species that utilize beaches upland transition areas for pupping, (3) buffer zone between SNI habitats and the developed environment, and (4) sources of prey and juvenile nursery habitat for subtidal species. There are currently no regulatory or financial incentives to improve the habitat value of shoreline structures, to minimize their use, or to remove them in favor of a more natural shoreline.
- Construction associated with shoreline structures can generate turbidity, sedimentation, erosion, noise, and lighting that may hinder successful fish and wildlife use of SNI waters.

Current Management

- **In cases where shoreline construction may affect listed species, mitigation is also required under the ESA.**

Shoreline construction or maintenance activity in waters of the U.S. is permitted under the CWA and also must comply with EFH conservation requirements under the Magnuson Stevens Fishery Conservation and Management Act, ESA-related protection of federally listed species, CZMA consistency, as well as NEPA and CEQ. A environmental assessment requirements. In cases where listed species may be affected, mitigation is also required under the ESA. Above the mean higher high water line, construction activities must comply with provisions of the CCA and are permitted by the CCC. The Navy, for example, has a General Consistency Determination for periodic replacement of piers and shoreline structures dated 1998 (CD-070-98).

Permitting for riprap and other structures that result in a complete fill to upland habitat is primarily reviewed for the requirement for no net loss of jurisdictional waters of the U.S. (a balanced cut and fill must be part of the site plan). Mitigation for fill is required, as well as for impacts to marine resources or listed species. Typically, construction activities that generate noise or turbidity are restricted during the western snowy plover season to avoid impairing their foraging activities. However, there normally is no consideration of differences in habitat value because of designs or materials used in a structure, other than materials that may allow more light. Setback buffer requirements may be imposed by the CCC for construction not related to erosion control or vessel access. Current precedent for construction permitted by the CCC for buffer distances is 50 feet (15 m) in freshwater areas, and 100 feet (30 m) for the salt marsh. The CCC could adjust this requirement based on requests from commenting resource agencies.

Assessment of Current Management

Little scientific study has been conducted on the effects of noise or lighting on species and habitats of concern in this INRMP. Mitigation requirements are based on biologist judgment and experience.

Management Strategy

Objectives and Strategies for Shoreline Construction

Objective: Ensure that shoreline construction activities do not increase erosion or adversely impact sensitive natural or cultural resources.

I. Ensure that the Navy's Regional Shoreline Infrastructure Planning integrates the goal and objectives of this INRMP.

II. Conserve existing habitat values by recommending setbacks for CCC permits for new construction that effectively protect habitat values, especially of sensitive habitats such as salt marsh/tidal flats.

III. Discourage the construction of seawalls, revetments, breakwaters, or other artificial structure for coastal erosion control, unless each of the following criteria is met (California Coastal Coalition Policy for Shoreline Erosion Protection 14 September 1978):

- *A.* No other nonstructural alternative is practical or preferable.
- *B.* The condition causing the problem is site specific and not attributable to a general erosion trend, or the project reduces the need for a number of individual projects and solves a regional erosion problem.
- *C.* It can be shown that a structure(s) will successfully mitigate the effects of shoreline erosion and will not adversely affect adjacent or other sections of the shoreline.
- *D.* Any project-caused impacts on fish and wildlife resources will be offset by adequate fish and wildlife conservation measures.

IV. Encourage the refitting of developed shorelines and existing structures to enhance habitat values.

- *A.* Besides providing their engineered function, design shoreline structures to mimic the original habitat structure and function (this refers to situations where the native substrate is a hard one). Maximize benefit to native SNI species of fishes, birds, and invertebrates.

V. Promote experimentation and application of alternative shoreline and underwater habitat structures.

- *A.* Develop objective design criteria.
  1. Incorporate the best understanding about the attributes of the target habitat that promote the desired function.
  2. Designs should incorporate several options or variations of a particular attribute to constitute a legitimate test of the concept, and to provide an adaptive direction towards design modification.
  3. Incorporate contingency plans for each design element.
- *B.* Monitor changes in invertebrate and algae populations that can result from alternative structural designs.
- *C.* Identify and prioritize desired ecological function of artificial structures, including: (1) trophic support for native fishes and birds, (2) habitat for migratory birds, (3) nursery/refugia for subtidal species, and (4) habitat for endangered and other special status species.

VI. Promote experimentation and application of alternative LID and habitat-friendly landscaped areas adjacent to the shore.

5.13 Natural Resources Consultation Requirements

5.13.1 Project and Mitigation Planning

Current Management

Mitigation is the process of minimizing impacts to protected habitats or species. As defined by the CEQ in 1978, it includes measures to avoid, minimize, rectify, reduce, eliminate, or compensate for the impact. In most cases, mitigation is undertaken in that order or "sequence" of preference, that is, from avoidance as a first priority to compensation as a last resort. Most mitigation policies and measures are agreed to as a result of protection under the ESA, CWA, or NEPA.

The USFWS policy does not use the term "mitigation" because it is not mentioned in the ESA. In the context of consultation under the ESA, restoration and other conservation measures are voluntary actions proposed by the project proponent to minimize impacts to listed species and provide alternative or protected habitat that promote conservation.The USFWS ranks four habitat categories according to their scarcity value, with "unique and irreplaceable" habitat receiving top priority for conservation measures. A mitigation planning goal must be established which may range from "no loss of existing habitat value" to "minimize loss of habitat value."

A CCA is a voluntary approach to avoid the listing as threatened or endangered of Candidate species. A "candidate species" is one that has been found to be warranted or where a petition has presented substantial information that a species may be warranted for listing, but has not yet been the subject of a proposed listing rule. Such an approach by the Navy helped the USFWS "take into consideration" Navy actions when considering listing the island fox, which eventually was listed on other nearby islands, but not on the Navy's SCI and SNI. A CCA allows a nonfederal or federal person to avoid ESA restrictions, while at the same time providing ample protection for the species. If an individual includes non-listed species in a CCA, the Service will decline to list a species either because it is managed under the CCA or by issuing a species permit to cover the species if it does become a listed species. Both CCAs and Safeharbor Agreements are accompanied by an enhancement of survival permit issued under 16 USC § 1539(a)(1)(A). Although they have been advertised as an incentive for private landowners to conserve species, most of these involve other governmental entities and not private property owners.

Both NMFS and USFWS have a long history of developing CCAs with federal agencies. However, because subsections 7(a)(1) and (a)(2) of the Act obligate federal agencies to affirmatively conserve listed species, an obligation not imposed upon non-federal property owners, the Services do not provide assurances to other federal agencies through these Agreements, as they do to private property owners (called Candidate Conservation Agreements with Assurances).

The USACE regulation provides that "all mitigation will be directly related to the impacts of the proposal, approximate to the scope and degree of those impacts, and reasonably enforceable." It also states "Consideration of mitigation will occur throughout the permit application review process and includes avoiding, minimizing, rectifying, reducing or compensating for resource losses. Losses will be avoided to the extent practicable. Compensation may occur on-site or at an off-site location." (33 CFR S 320.4[r]). USACE has a three-step sequencing procedure for evaluating impacts to wetlands: (1) avoid, (2) minimize, and (3) compensate. Avoidance includes demonstrating that there is no practicable alternative which would have less adverse impact. Minimization requires that consideration be given to redesigning or staging a project to reduce impacts. Compensatory mitigation includes creation, restoration, enhancement or preservation. All impacts must be avoided or minimized before compensating mitigation will be considered. In some cases, mitigation banking is the appropriate approach to compensating mitigation.

Facilities can get funding through three processes: "Special Projects" is competitive among all CNRSW installations through use of "Integrated Priority Lists". Military construction projects require direct authorization from Congress. "Demolition Projects" is a program that allocates resources to demolish and dispose of excess infrastructure. NAVFACINST 11010.44E CH 1 (01 October 1990) explains the process for planning for shore facilities. It provides guidance on the preparation of MILCON, and Nonappropriated Funded (NAF) project documentation, and for the preparation of site approval documentation required by MILCON, NAF, and Special Projects.

Assessment of Current Management

Project and mitigation planning at SNI will continue to avoid, minimize, rectify, reduce, eliminate, or compensate for any identified environmental impact. In most cases at SNI, mitigation will continue to be undertaken in that order or "sequence" of preference, that is, from avoidance as a first priority to compensation as a last resort.

Management Strategy

Objective and Strategies for Mitigation

Objective: Plan mitigation and conservation measures to avoid or minimize effects on special status resources first, then compensate for unavoidable effects.

I. Use this INRMP as an initial screen for review of projects proposed on the installation from both Navy and outside interests. All proposals should provide the following information regarding natural resources:

A. The acres of habitat currently present on the site based on the most current vegetation map for the installation.

B. The known sensitive species locations on or adjacent to the site which can be obtained from the ED GIS specialist.

C. A natural resource review should still only be one part of a project-by-project review conducted for each proposal.

II. Improve the success of mitigation and enhancement projects based on regulatory, functional, and ecosystem criteria by using:

A. Performance work statements (do what and by what standard...by whom and with what money);

B. Project lists (one-time projects);

C. Standardized scopes of work for recurring work; and

D. A work load plan in Microsoft Project.

III. Provide clear direction on how to exercise a nationwide permit so that project work is facilitated. If a number of projects may be coming down the pike, treat them as a bundled group and get one permit with one public contact period. Best Management Practices would be described and if the project stayed within the guidelines, a simple letter would need to be sent to the USACE notifying the Corps of the project, and no additional public notification would be necessary. This a way to streamline consultation.

IV. Consider the use of Cooperative Agreements to get work done, especially research. A Cooperative Agreement is used to acquire goods or services or stimulate an activity undertaken for the public good. Cooperative agreements assume substantial involvement between the federal agency and recipient during performance of the activity. Cooperative agreements may be used to accomplish work identified in the INRMP, and may be entered into with states, local governments, non-governmental organizations, and individuals to provide for the maintenance and improvement of natural resources on, or to benefit natural resources research on USDOD installations. Agreements authorized by the SAIA (22-2.5) are not subject to the provisions

of the Federal Grant and Cooperative Agreement Act, but must comply with the procedural requirements of the USDOD Grant and Cooperative Agreement Regulations. Funds approved for a particular fiscal year may be obligated to cover the costs of goods and services provided under a cooperative agreement during any 18-month period beginning in that fiscal year in accordance with the SAIA of 18 November 1997 (OPNAVINST 5090.1C).

A. A long-term advisory relationship and cooperative research relationship could continue with local universities. Many biological studies have been conducted on SNI by university faculty and graduate students.

V. Ensure consistency with Coastal Zone Plans. The CZMA requires that Navy installations ensure their operations, activities, projects, and programs in or on coastal lands or waters that affect coastal zones, comply with the coastal state's approved management program to the maximum extent practicable and shall cooperate in resolving concerns identified during the consistency review process (OPNAVINST 5090.1C).

VI. Ensure that all necessary permits are obtained for restoration projects or make sure they are part of the restoration banking package, such as USACE Section 404 permit (federal), CCC, 1603 section permit CDFG, and possibly NPDES permits to discharge water into the wetland (RWQCB 2004).

VII. Seasonal Avoidance Measures. During the active growing and breeding season, many species and habitats are more sensitive to disturbance that may cause harm, harassment, or severe damage. Limitations on the timing of activities to avoid and minimize adverse effects can appear to leave little time for work. Wetland resources are most sensitive during and shortly after the rainy season when the ground is still wet (about November 1 – April 30; annual variation will occur and actual situation should be verified by a qualified biologist prior to actions). USFWS should be contacted early on in the planning process to help define other species and timing restrictions that may be necessary.

A. Phasing of Work. Often, careful planning can show that impacts to the differing resources can be phased or avoided. To assist project planners, a schedule of sensitivity periods will help. Where the conduct of activities cannot be planned to avoid sensitive periods, project specific authorizations and appropriate additional impact minimization measures should be planned for and expected from regulatory agencies.

VIII. Standard Mitigation Measures. The following mitigation measures should be planned for all proposed actions unless a determination can be made, in consultation with the ED, that they are not appropriate:

A. Avoidance and Minimization First. Proposed actions must include requirements for impact avoidance and minimization measures. Because the intent is to lessen the severity of an action, the first step should be avoidance of impacts. Once avoidance has been implemented to its fullest extent, remaining impacts should be minimized prior to consideration of off-site compensation for damaged resources as a last resort. This must be the first step in the mitigation planning process because numerous regulatory authorizations require demonstration of maximum impact avoidance and minimization before authorization may be given. Measures which should be considered, as applicable are: worker environmental protection briefings, signs, markers, protective fencing, biological monitoring, erosion and sedimentation prevention, noise baffling, and temporary impact restoration. These should be included as part of the environmental protection plan of the environmental protection requirements for all standard operating procedures, work requests, and contracts during planning.

B. *Consider Indirect Effects.* Indirect effects of a proposed action must be addressed. Indirect effects have an impact at some point later in time. This may be the case where use and maintenance of a new facility is likely to have an adverse effect beyond the building "footprint" following construction. For example, fencing may be necessary to prevent landscape maintenance and concentrated human foot traffic from damaging naturally occurring resources that were avoided by the construction of a building. Often, maintenance and safety considerations associated with new or reutilized facilities, such as wildfire fuel breaks, are overlooked by planners and are not realized until use is implemented. Such considerations must be treated as part of the initial project and mitigated accordingly.

   1. In addition to direct habitat loss, less tangible direct and indirect effects may result from a proposed action. Some examples of indirect effects can include: lights; noise; increased access by vehicles, off-road vehicles, humans, pets (increased pet use of natural areas [with housing]; invasive weed or exotic plant introductions; shading; need for fire suppressions or fuel modification (setbacks or clear zones); irrigation runoff; pesticides, herbicides and/or fertilizer overspray or runoff; oil, grease and gasoline runoff; erosion and sedimentation; and operation and maintenance of new facilities. Most common concerns are noise associated with construction and subsequent use that extends beyond the immediate work or activity area, outdoor lighting that may require shielding, visual harassment by human activities and equipment operation, changes to wetland hydrology, and sedimentation from construction sites to wetlands. Often the temporary effects that may result from construction are avoided by performing work outside the sensitive breeding and growing seasons as presented in this planning guidance. Potential effects must be evaluated. Effects that are likely to have a longer or permanent adverse effect must be mitigated.

C. *Survey Protocols.* Federally threatened or endangered species presence or absence determinations must be made using, if available, survey guidelines developed by the USFWS or other means acceptable to them. Where no such guidelines or protocols exist, surveys must be conducted by qualified permitted persons (as defined below) using methods recognized and accepted by scientific experts in the professional consulting field. When making presence/absence determinations relative to a project, areas where indirect effects may affect species must be considered as well. If a habitat is used by a species for some important part of their life cycle, it is considered occupied regardless of the presence of the species at any one time. Corridors for animal movement, such as rivers and streams, are important considerations in the overall analysis.

D. *Use of a Qualified Biological Monitor.* A biological monitor or qualified biologist should be retained, in coordination with the natural resources biologists, to educate workers, oversee and implement impact avoidance and minimization, document impacts, and guide revegetation efforts for all proposed actions that require active avoidance or actually will affect threatened or endangered species, wetlands (including vernal pools), require active revegetation, or habitat compensation. At a minimum, this individual must have: (1) a bachelor's degree with an emphasis in ecology, natural resource management or related science; (2) demonstrated local experience with resource(s) involved; and (3) a good understanding of the regulations regarding wetlands and state and/or federal threatened and/or endangered species. Section 10(a)1A permits under the ESA are required for biological monitors that check federally listed bird nests, conduct trapping efforts for federally listed species, or otherwise handle federally listed species. These permits are obtained from USFWS. Requests for these permits should be submitted to both USFWS Regional Office in Portland, Oregon and Carlsbad Field Office, USFWS, California.

E. *Compliance with Migratory Bird Treaty Act.* Migratory birds are generally protected by the MBTA and implementing regulations and orders. On SNI, all but three birds are covered (rock doves, European starlings, and house sparrows). Planners must review proposed actions with regard to conduct of actions during the active breeding season (can be January – September) and project caused loss of traditionally used nesting/roosting sites. Habitat clear-

ing activities should be timed to avoid the breeding season to maximum extent practicable to avoid damage to active bird nests. Compensation for the loss of traditionally used nesting/roosting sites may be an issue for raptors. All contracts and work orders prepared for SNI must include provisions in the Environmental Protection section which prohibit harming, damage, or destruction of active bird nests while requiring "work arounds" without incurring additional cost. The SNI natural resources biologists, NAVFAC Southwest, or CNRSW NRO can provide contractual language prepared and approved by the U.S. Navy for construction contracts on SNI.

1. Under recent developments regarding implementation of the MBTA and USDOD under the 2003 NDAA, the House Armed Services Committee provided USDOD with authority under which the MBTA would not apply to the incidental taking of a migratory bird by USDOD during an authorized military readiness activity.

F. *Restoration Plans to Be Completed in Advance.* All actions that require active habitat restoration, enhancement, and/or compensation must have an appropriate plan developed prior to implementation. Such plans must discuss the site conditions, methods to be implemented, monitoring and maintenance (usually three–five years), success criteria, remedial actions if expected success is not being achieved, and reporting requirements. The plans must ensure that all applicable requirements of regulatory approvals are incorporated. Often, regulatory agencies require that they have an opportunity to review and approve plans where their authorization for resource impacts is provided. Regardless, review and approval of plans must be accomplished through the site approval process.

IX. *Catalog and Track Success of Measures Employed.* It is helpful to maintain a reference catalog of past avoidance, mitigation, and compensatory measures that have been used, and a system for ongoing evaluation of their effectiveness.

X. *Catalog and track mitigation sites.* Maintain a record of all mitigation sites and the status and phases of each.

5.14 Landscaping and Grounds Maintenance

Specific Concerns

- The Grounds Maintenance Contract needs to be evaluated for consistency with recent EOs or Navy policy.
- Recommendations of the Base Exterior Architecture Plan should be evaluated for consistency with respect to landscaping.

Current Management

Maintenance of semi-developed and developed grounds is accomplished at SNI with technical assistance from staff in NBVC Environmental Division. Landscaping and grounds keeping work occurs primarily within the Community Support area at SNI. It is anticipated that future native plant landscaping will be developed to accompany facility renovations and improvement around the Community Support Area. Future landscaping at SNI will follow the guidelines set forth in the "San Nicolas Island Landscaping Plant List" (see Appendix F).

The purpose of the San Nicolas Island Landscaping Plant List is to provide a clear set of approved plants that are not known to be invasive to the island. All plant selections (outdoor landscape or indoor plants) for SNI must be approved by appropriate staff in NBVC ED. Specifically, landscape designs and plant lists shall be reviewed and approved by the Installation Natural Resource Specialist and the NAVFAC Landscape Architect in the planning stages of project design.

NBVC supports the goals of EO 13148 (21 April 2000) *Greening the Government Through Leadership in Environmental Management* and promotes the President's 26 April 1994 *Memorandum on Environmentally Beneficial Landscaping*. It is Navy policy to:

1. Use regionally native plants for landscaping.
2. Design, use and promote construction practices that minimize adverse effects on natural habitat.
3. Prevent pollution by reducing fertilizer and pesticide use, integrated pest management practices, recycling green waste (composting) and minimizing runoff.
4. Implement water-efficient practices, use efficient irrigation systems and recycled water, and use landscaping to conserve energy.
5. Create demonstration projects to promote awareness of environmental and economic benefits of these practices.

■ **NBVC supports the goals of EO 13148 (21 April 2000) *Greening the Government Through Leadership in Environmental Management* and promotes the President's 26 April 1994 *Memorandum on Environmentally Beneficial Landscaping.***

Water conservation is emphasized in landscaping and grounds maintenance at SNI through the use of xeriscaping practices. For example, watering is not included as part of landscaping and grounds maintenance efforts (S. Schwartz, *pers. comm.*, 2009). Xeriscaping, an important aspect of the water conservation program, is based on the use of native or drought-resistant plants and efficient irrigation practices that require less water. Principals of xeriscaping include the following:

- Using drought tolerant species of plants that require a minimum of maintenance;
- Using mulch as a ground cover to preclude weed growth and enhance water retention;
- Using plastic or rubber-based products to prevent the growth of undesirable species;
- Using species that accomplish a goal, such as using ground cover to prevent blowing dust and soil erosion;
- Watering using automatically controlled cycles during low evaporation periods; and
- Using drip irrigation whenever possible.

Xeriscaping can be both functional and aesthetic and will continue to be used to the extent possible at SNI.

Assessment of Current Management

Continued use of the San Nicolas Island Landscaping Plant List and adherence to the principles of xeriscaping are necessary and sufficient to maintain compliance with EOs and Navy policy.

Intact native ecosystems at SNI are easier to manage for long-term stability with the use of native plants for landscaping, as exotic non-native species have the potential to escape into natural areas. Native plants, especially successional species, are considered as a landscaping choice. Native plants provide extra resources for native pollinators and birds thus helping to buffer the edge effect on neighboring intact ecosystems. Land developments and road maintenance provide opportunities for plant salvage as ecologically appropriate and low cost landscaping resources.

It is vital that coordination with the Installation Natural Resource Specialist and the NAVFAC Landscape Architect occur early in the planning process to determine site-specific needs and constraints. Please note that other species may be used for landscaping but must be approved by Installation Natural Resource Specialist and the NAVFAC Landscape Architect prior to specifying on plans or scopes of work. These species must be screened through regional invasive plant lists. Only seed may be brought to the island at this time, no plants in soils. Contact Installation Natural Resource Specialist with any questions or requests for plants not on the approved San Nicolas Island Landscaping Plant List. This San Nicolas Island Landscaping Plant List is updated periodically. Prior to initiating a project, please obtain the most recent list from the Installation Natural Resource Specialist.

Management Strategy

Objectives and Strategies for Landscaping and Grounds Maintenance

Objective: Sustainably improve the visual and aesthetic environment for both civilian and military personnel living, working, or visiting San Nicolas Island, while maintaining the integrity and character of cultural resources.

I. Comply with cultural and environmental laws, EOs, and Navy policies by considering environmental factors and their potential effects on cultural resources in landscape planning.

A. Continue to update the NBVC San Nicolas Island Landscaping Plant List.

■ **Federal agencies are restricted in the use of exotic (non-native) plant species in any landscape and erosion control plantings, as indicated by EO 13112.**

B. Consult with the Natural Resource Specialist for questions, comments, or concerns regarding landscaping before a project is submitted.

C. Develop an SNI Instruction that outlines an appropriate landscaping and grounds maintenance program consistent with EO 13123 and EO 13112.

D. Continue to update the Vegetation Management Plan every five years.

E. Ensure mowing, use of rodenticides, and other grounds keeping practices are consistent with USFWS BOs, terms of USACE permits, mitigation obligations agreed to in EISs, other legal agreements, IPMPs and natural resource management plans.

1. Modify the Ground Maintenance Contract for the groundskeeping contract to comply with this INRMP.

2. Ensure that these requirements are communicated to grounds keeping staff.

3. Make sure Grounds Maintenance plans are consistent with the IPMP.

F. Consult with NBVC Cultural Resources Program Manager before starting any landscaping project to make sure no cultural resources will be negatively affected.

II. Follow guidelines set forth in the SSI for planting site appropriate plants in a low impact and sustainable way.

A. Use landscaping design to benefit the human working environment by moderating environmental influences (e.g. solar heat gain, glare, dust, and wind), conserving energy, protecting water quality, preventing soil erosion, reducing glare, buffering noise, improving visual aesthetics, providing wildlife habitat, and unifying exterior spaces.

B. New lawns are discouraged except where functionally essential. Lawns require frequent watering and should be restricted to: formal areas such as for ceremonies, family housing, recreation fields, and children's playgrounds. Replacing turf with native and drought tolerant plants in combination with rocks or gravel over bare areas will save large amounts of water. Turf replacement can also be done in a very aesthetically pleasing manner and can equal turf in terms of dust control.

C. Implement new technology to reduce water usage whenever possible.

D. Utilize xeriscaping to the maximum extent possible.

III. Consider landscaped areas and stormwater systems as continuous with the wetland system and ensure compatibility with natural resource objectives.

IV. Use island native plants whenever possible. If native plants are not available or do not suit the project objective, the CNRSW Natural Resources Office Botanist may grant permission for the use of non native plants with other beneficial attributes such as drought-tolerance, fire resistance or other special purpose species. Remove and eliminate the use of invasive exotic plants in landscaping. Favor natives over exotics using good maintenance practices.

A. All SNI contracts related to grounds maintenance should include language that promotes implementation of the INRMP.

B. All plants should be from native seed or plant material collected on SNI.

C. Eliminate the use of invasive exotic plants in landscaping.

D. Incorporate historically appropriate plants in areas with existing architecture.

1. Provide a coordinated landscape color scheme for the housing and administration areas which will enhance the existing architecture.

E. Provide weed control.

1. Use mulches to reduce evapotranspiration and control weeds.

2. Apply herbicides on an as-needed basis only.

F. An approved mowing schedule/map should be incorporated into this Instruction, as well as the groundskeeping contract.

■ **In keeping with federal standards, Navy policy requires minimizing disturbance to native habitats and using integrated pest management practices, xeriscape landscaping, and recycled water in arid environments.**

V. Minimize the use of pesticides and herbicides in landscape management by following the NBVC IPMP. Continue to develop an Integrated Pest Management approach to dealing with pest problems at SNI.

A. Be consistent with existing NAVFACINSTs on Integrated Pest Management guidance (OPNAVINST 6250.4B 1998) (Appendix C).

■ **If any multiple-use program of land management involves pesticides, users will ensure that use complies with applicable requirements. Consistent with Chapter 13, pesticide use will be minimized. Coordinate pesticide use with the installation and supporting NAVFAC (look up) pest management personnel.**

VI. Perform regular maintenance of any irrigation system and upgrade when appropriate.

A. Check the irrigation system often and repair leaks, broken sprinklers and clogged emitters.

B. Upgrade manual systems and hand watering to automatic "smart" systems.

VII. Unless there is an identified conflict with the military mission, avoid groundskeeping practices that may affect sensitive species.

A. Comply with the MBTA for migratory and resident birds during tree trimming, pruning, or removal.

B. Check timing and location of mowing in natural areas to avoid impacts to sensitive species.

VIII. Augment goals of force protection by incorporating landscaping into physical barriers surrounding buildings and visual protection barriers between the SNI and public waters or between high security areas.

A. Use landscape planters to create a physical barrier between vehicles and structures at the specified distance as required under new security restrictions following the September 11, 2001 terrorist attack.

B. Use trees and shrubs to block all undesirable views, noise, and lights and provide privacy.

■ **The MBTA is an international agreement between the U.S., Canada and Mexico that protects designated species of birds. All birds are protected under the Act, with some exceptions. The MBTA controls the taking of these birds, their nests, eggs, parts or products. Violations of the MBTA can result to fines up to $2,000 or two years imprisonment.**

IX. Prioritize landscape improvement projects while using the following guidelines for implementation.

A. Ensure that all new projects and contracts follow the guidelines and any implementation Instructions.

B. Give high priority to areas that serve as important gathering places or highly used areas.

C. Implement projects that will reduce water usage and help meet water conservation goals.

D. Plant a demonstration conservation garden of regionally native plants for education of personnel.

5.15 Real Estate Outgrants

Specific Concerns

OPNAVINST 5090.1C requires the Navy to identify areas that may be suitable and available for agricultural out leasing or commercial forestry. More specifically, the Military Construction Authorization Act provides for the use of USDOD lands under a lease to an agency, organization, or person for the purpose of agricultural out leasing or the production of and sale of forest products that have commercial value.

Current Management

At SNI there are no forestlands suitable for timber production. Because of the lack of timber, aridity of the island, and limited water resources for irrigation, the development of timber resources on SNI is not possible. Commercially viable agriculture is not realistic for the island due to past historic grazing practices from which the island is still recovering, and due to limited water and conflicting land use it is not compatible with SNI's mission.

Assessment of Current Management

Because the determining factors regarding island usage are compatibility with the military mission, safety issues associated with the military mission, and the protection of cultural sites, sensitive environmental habitats and managed species, the Navy has no plans to initiate commercial use, such as grazing, agriculture, or oil exploration, on the island.

5.16 Outdoor Recreation

Specific Concerns

- There are limited outdoor recreational opportunities at SNI that must be compatible with military safety and security needs.

Current Management

- **The SAIA requires installations to provide public access for natural resources uses to the extent it is appropriate and consistent with the military mission, including implementation of programs and projects called for within the Installation's Cooperative Outdoor Recreation Section of the Installation's INRMP.**

An MOU between USDOD and USDOI provides guidance on the management of natural resources for outdoor recreation. It set up the NPS as a cooperator in developing outdoor recreation plans for military installations where there are suitable resources for such a program consistent with national security.

The SAIA requires each military service to provide outdoor recreation and interpretive opportunities to the public where and when it is compatible with military safety and security needs. Outdoor recreation activities are intended to support the wise stewardship of USDOD's natural resources. In the event of potential conflicts of use, sound biological management practices shall prevail. Outdoor recreation, as defined for the purposes of this section, is the active use of the installation's natural resources for recreation and physical exercise.

OPNAVINST 5090.1C, states that military lands and waters shall be made available to the public for recreational usage to the extent it is appropriate and consistent with the military mission, and that the natural resources will support such usage. Since SNI is the site of weapons testing and sensitive equipment, public access is prohibited in the interest of security and safety. This precludes recreational use of the island by the general public.

Outdoor recreational opportunities are available to island personnel, and are regulated by the installation for the protection of cultural and natural resources. Land-based recreational activities are not allowed on the south side of the island. This INRMP does not regulate offshore recreational activities, other Navy requirement such as safety and security do.

Outdoor recreational activities at SNI include hiking, biking, fishing, wildlife observation, diving, surfing, kayaking, and boating. Interested individuals periodically suggest the potential for chukar hunting on the island. Safety, security, cultural resource protection, and natural resource management concerns make hunting on the island infeasible. Bird hunting programs have a significant potential to negatively impact the Island fox population. Introduction of a canine disease via hunting dogs could jeopardize the existence of the population, and hunting would result in reduction of an important prey resource of the fox.

The two categories of outdoor recreation opportunities recognized for Island personnel are concentrated area activities and dispersed area activities.

Concentrated Outdoor Recreation Areas and Activities - Cissy Cove, Corral Harbor, and Daytona Beach are popular sites for outdoor recreational pursuits (NAVFACSW 2010a). Personal watercraft to be used for recreational fishing are launched from Cissy Cove. Corral Harbor is favored for snorkeling and diving. Daytona Beach is the popular fishing spot. Surfing, boat use, and recreational diving are all popular activities on the Island. All of these activities have been restricted to specific areas on the Island to preserve natural and cultural resources and ecologically sensitive areas (NAVFACSW 2010a).

Dispersed Outdoor Recreation and Activities - Fishing is probably the most popular dispersed recreational activity on SNI. The island is surrounded by lush kelp forests, exhibits an upwelling of nutrient, and has numerous fishing spots along the shoreline. Many of the better areas to fish are identified by fishing signs (NAVFACSW 2010a). Some of the more common species include cabezon, California sheephead, rock bass, white bass, and calico bass. Fishermen must have a California ocean-fishing license to fish on SNI and abide by bag and size limits. The CDFG is responsible for the enforcement of fishing regulations on the Island, although among the small SNI community, peer pressure to abide by the rules and regulations appears to foster self-regulation of fishing laws (NAVFACSW 2010a). Fishermen must also abide by SNI area closures due to environmental laws protecting certain wildlife and respect cultural resources areas, such as Native American middens located near coastal areas. Environmental personnel post flyers regarding fishing on SNI, including specific information on different species of fish and catch limits, in obvious locations (NAVFACSW 2010a).

Assessment of Current Management

Hiking has the greatest potential for development as a dispersed outdoor recreational activity at SNI. However, due to the abundance of protected natural and archaeological resources, hiking is currently limited. A system of officially designated and marked (route markers and interpretive signs) hiking trails could be developed in appropriate areas. Designated trails would reduce disturbance to sensitive areas, reduce destruction of vegetation, and provide additional recreational opportunities on SNI.

Continued use of signs to raise awareness of marine mammal haul out locations is needed. Various signs have been posted to protect marine mammal haulout and breeding sites. Interpretive brochures are available at the airfield. Natural resources staff routinely provide briefs to Navy personnel and contractors regarding precautions around sensitive wildlife. The planned development of a future SNI Outdoor Recreation Plan will address recreational access for Navy staff and island personnel that ensure that any planned recreational access is compliant with the requirements associated with the provisions of the American with Disabilities Act of 1990 as amended and the Disabled Sportsman Access Act as amended.

Management Strategy

Objective and Strategies for Outdoor Recreation

Objective: Promote compatible, sustainable outdoor recreation opportunities which enhance quality of life for military personnel, while conserving natural resources, and without compromising the military mission.

I. Continue to limit public access and outdoor recreation for reasons that include general security and liability issues, the presence of federally endangered and threatened species, and fire safety.

II. Develop an updated outdoor recreation plan that includes both military personnel and public components where if possible. Seek opportunities for natural resources-based outdoor recreation to improve quality of life for Navy personnel, allow close partnership with the local community, improve knowledge of the natural world and the Navy's stewardship of natural resources.

- *A.* Identify major themes from Navy point of view. Identify and evaluate suitable outdoor recreation opportunities for installation personnel in developed areas.
- *B.* The outdoor recreation plan should include wording for a U.S. Navy Instruction on outdoor recreation that includes maps of where outdoor recreation is allowed and not allowed, and whether it is permitted for the general public or military personnel and dependents only.
- *C.* Cooperative agreements with NPS, in conjunction with the INRMP, are the mechanism for a program of planning, development, maintenance, and coordination of outdoor recreation on Navy lands.

III. Identify and evaluate suitable outdoor recreation opportunities for installation personnel in undeveloped areas that do not contain or have the potential to impact sensitive species.

- *A.* Seek strategies for compatible use and overall protection of outdoor recreation resources.
- *B.* Provide interpretive material about native habitats, sensitive species, and areas to avoid because of the presence of sensitive resources.
- *C.* When appropriate, develop brochures, on-site interpretive signage, and a field guide for wildlife viewing.
- *D.* Continue to ban all hunting, for reasons of security.
- *E.* Provide, where possible and compatible with the mission, development and enhancement of fishing, and other outdoor uses of natural resources for the disabled.
- *F.* Off-road vehicle use for recreation is an incompatible activity at SNI, for reasons of security, safety, fire, and the presence of threatened and endangered species.

IV. Maintain recreational opportunities on SNI consistent with the military mission.

- *A.* Periodically review appropriateness of instituting new outdoor recreation activities.
- *B.* Investigate development of designated hiking trails.
- *C.* Periodically review and update recreational policies to ensure compliance with environmental management regulations.
- *D.* Prepare and annually update maps of recommended and prohibited diving, surfing, kayaking and boating locations.

5.17 Environmental Education

Specific Concerns

- Environmental education concerning the island's natural history could benefit from better integration into the existing network of professionals in natural resource interpretation.
- Understanding of the island's cultural value, how it has been viewed and used past and present, can help education programs effective at reaching target audiences.
- Professionals who manage the island and political decision-makers who affect the Island's management need to be informed about SNI natural resource issues in order to advocate for them.
- Secure, long-term funding is needed to ensure the continuance of environmental education programs at SNI.

Current Management

The SAIA requires each military service to support environmental education for personnel and for the public where and when it is compatible with military safety and security needs.

Assessment of Current Management

In regards to environmental education, most data sets and studies have been generally inaccessible to educators and the public. The island is also generally out of the public mindset, with most news being negative. Few understand the global significance of the natural resources here. In order to develop caring and responsibility for its resources, an educator's job is to foster a "sense of place" (Nabhan 1998), or ownership in the living organisms that share residence with humans. This is facilitated by developing a curriculum of stories to be told about living resources and how people relate to them now, or have related to them in the past. To build the stories, educators require direct access to technical data sets, and accurate summaries of these data sets so that they can be effectively interpreted in a manner that captures the public's attention and imagination.

- **A sense of ownership and responsibility for SNI may be fostered by a curriculum of stories to be told about living resources that live there.**

Management Strategy

Objective and Strategies for Environmental Education

Objective: Build a strong conservation ethic and personal commitment to environmental stewardship by all personnel.

I. Improve SNI community and environmental outreach and service.

A. Improve outreach and build relationships with the community, with more local, defined groups such as boating clubs, rather than "random absolutes" that introduce security issues.

II. Improve access for environmental educators to studies, data sets, and summary reports so that curriculum development can be facilitated.

III. Establish a new or build on an existing community-based restoration program, in cooperation with government agencies and private non-profit groups already involved in the Channel Islands or environmental education, U.C. Sea Grant, NMFS, etc.

IV. Expand existing educational partnerships among nonprofit organizations, government, schools, and businesses that focus on the Channel Islands.

A. Foster cooperative agreements with local environmental education, interpretive, or nature centers.

B. Initiate a "SNI Camp" oriented towards high school students that includes a mentorship program pairing students with researchers.

C. Continue to cosponsor workshops, seminars, literature, web page, and other outreach activities.

D. Institutionalize permanent interactive environmental educational programs with local schools about the island.

1. Promote the use of the island by universities for education and research studies.

2. Schools should be given real problems with real data sets to work with. Involve high schools in long-term monitoring of basic measurements.

3. Expand the use of educational field trips.

E. Support training and use of volunteers to provide additional outreach to adults and children.

1. Provide recognition of volunteer contributions.

2. Encourage volunteer assistance with Christmas bird counts organized by the Audubon Society.

V. Target awareness for Navy personnel, Coastal Commission, and other managers and decision makers.

A. Announce and carry out a highly visible pilot project to improve habitat value.

B. Promote awareness of this Plan and its use as a reference tool.

VI. Evaluate the effectiveness of existing environmental education programs.

A. Continue to compare the before-and-after awareness level of the participants.

B. Continue to update the targets for desired awareness levels on different topics for each age group, including adults.

1. Topics should include diversity of fish and wildlife, nondisturbance of marine mammal haulout and breeding sites, bird foraging and nesting sites, stewardship, recreational impacts, and historical and current habitats.

C. Adjust the programs if desired awareness is not achieved.

VII. Secure long-term funding to ensure continued environmental education programs.

5.18 Natural Resources Law Enforcement

Objective and Strategies for Natural Resource Law Enforcement

Management Strategy

Objective: Provide for enforcement of natural resources laws and regulations by professionally trained personnel.

I. Commanders shall permit federal and state Conservation Officers access to enforce natural resources laws after taking proper safety and security measures. Assistance from federal and state Conservation Officers should be solicited with any existing or proposed Wildlife Law Enforcement Program on the installation.

II. Take steps to discourage and minimize the impacts of unauthorized access.

6.0 Implementation Strategy

To successfully attain this INRMP's Goals and Objectives, the measures in Chapters 4 and 5 need to be prioritized, assigned, and prepared for funding. This chapter lays out an implementation strategy that is a key component of the Navy's adaptive management approach, and is consistent with the budgeting hierarchy of USDOD and Navy directives.

6.1 General Considerations

A successfully implemented INRMP will:

- Ensure the sustainability of all ecosystems encompassed by SNI.
- Ensure no net loss of the capability of SNI lands to support the USDOD mission.

Formal adoption of an INRMP by a Regional Commander or Installation Commanding Officer constitutes a commitment to seek funding and execute, subject to the availability of funding, all Level 4 projects and activities in accordance with specific timeframes identified in the INRMP. The INRMP is considered implemented if the installation:

1. Actively requests, receives, and uses funds for all Level 4 projects and activities;
2. Ensures that sufficient numbers of professionally trained natural resources management staff are available to perform the tasks required by the INRMP;
3. Coordinates annually with all cooperating offices; and
4. Documents specific INRMP action accomplishments undertaken each year.

For a description of "Level 4" projects and activities and budget programming hierarchy for this INRMP (both USDOD and Navy), see *Section 1.9: Stewardship and Compliance Criteria for Implementing Projects*.

Successful implementation of this INRMP will depend upon not only the guidelines set up and projects described, but how well these are translated into performance work statements (who will do what and with what money), project lists and scopes of work, and a workload plan. It must fit into the formal EMS established at NBVC for integrating environmental considerations into day-to-day activities across all levels and functions of Navy enterprise (see *Section 1.10: Ecosystem Approach*). San Nicolas Island's

- **For more information on INRMP guidance refer to the OUSD Memorandum for DASN, INRMP Template dated 14 August 2006. This Memorandum is included in Appendix B, *Section B.3.4: Department of Defense Directives, Instructions, and Memorandums*.**

regionally significant natural resources, and its strong staff and environmental ethic set the stage to help lead island resources management in partnership with other agencies. To accomplish this, SNI will need to take advantage of funding opportunities outside normal program boundaries, consistent with authority to receive and use any such funds.

6.1.1 Responsibility

The responsibility for development, revision, and implementation of INRMPs is shared at every level among many different command elements. SECNAVINST 6240.6E assigns responsibility for establishing, implementing, and maintaining the natural resources programs under the jurisdiction of SECNAV to the CNO/Chief of Naval Installations (CNI). Regional command and coordination is provided by the major claimant, Navy Region Southwest, and the Regional Environmental Coordinator. These entities ensure the programming of resources necessary to establish and support an integrated natural resources program consistent with legislative requirements, USDOD policy, and stewardship. As the Navy shore infrastructure continues to change through reorganization and regionalization, many natural resource functions that formerly were the responsibility of installation commanders have passed to these regional commanders and area coordinators as part of their responsibilities.

NAVFAC SW is responsible for providing technical assistance for both compliance and stewardship obligations, and to evaluate and validate requests for funds for natural resource projects. This engineering activity administers the Navy forestry and agricultural outlease budgets, fish and wildlife/hunting and fishing fee and permit projects, contracts, and cooperative agreements. Upon request from CNO/CNI coordinates natural resources requirements with other federal, state, or local agencies, including the acquisition of INRMP “mutual agreement” between the Navy, USFWS, and state fish and wildlife agencies. NAVFAC SW also maintains natural resources program information needed to satisfy reporting requirements, legislative information requests, and to support project requests. This information is collected in the NAVFAC Natural Resources Data Call Station and applicable GIS programs.

Installation COs or Officers-in-Charge (OICs) endorse via signature their INRMPs. Their responsibility is to act as stewards of natural resources under their jurisdiction and integrate natural resources requirements into the day-to-day decision-making process. To accomplish this, they involve appropriate tenant, operational, training, or research and development commands in the INRMP review process to ensure no net loss of the military mission. At their discretion they may bring in Navy Judge Advocate General or Office of the General Counsel Legal Counsel to provide advice and counsel with respect to legal matters related to natural resources management and INRMPs (OPNAVINST 5090.1C).

Formal adoption of an INRMP by a CO or OIC constitutes a commitment to seek funding and execute, subject to the availability of funding, all "must fund" projects and activities in accordance with specific time frames identified in the INRMP. Under the SAIA, any natural resources management activity that is specifically addressed in the INRMP must be implemented (subject to availability of funds). Failure to implement the INRMP is a violation of SAIA and may be a source of litigation. Since the SAIA requires implementation of the INRMP, there is a clear fiscal connection between INRMP preparation, revision, implementation, and funding. Funding to implement natural resources management will largely come from program sources (through CNRSW). Accordingly, it is vital that budget personnel understand and participate in the INRMP process.

Further, a SECNAV memorandum (12 August 1998), stated:

> “All projects essential to fulfill the selected alternative (mix of management objectives) must be implemented within a timeframe indicated in the INRMP. Any deviation or change from achieving the selected alternative may require supplementation to the EA or EIS and an opportunity for public comment.”

Adequate training of natural resource personnel is important to the success of military sustainability and land management. OPNAVINST 5090.1C requires that Navy commands develop, implement, and enforce the management plan through personnel with professional training in natural resources. "Natural resources programs shall support military readiness and sustainability and commands shall assign specific responsibility, provide centralized supervision and assign professionally trained personnel to the program. Natural resources personnel shall be provided an opportunity to participate in natural resource management job-training activities and professional meetings." The SAIA (Section 670g) also addresses this need, as well as USDODINST 4715.3 (03 May 1996).

- **Funding to implement an INRMP is an important responsibility of Navy commands and shall be included in installation Program Objective Memorandum submittals.**

6.1.2 Federal Anti-Deficiency Act

San Nicolas Island intends to implement recommendations in this INRMP within the framework of regulatory compliance, national Navy mission obligations, anti-terrorism and force protection limitations, and funding constraints. All actions contemplated in this INRMP are subject to the availability of funds properly authorized and appropriated under federal law. Nothing in this INRMP is intended to be nor must be construed to be a violation of the Anti-Deficiency Act (31 USC 1341 *et seq.*).

6.1.3 Staffing

The SAIA specifically requires that there be "sufficient numbers of professionally trained natural resources management and natural resources enforcement personnel to be available and assigned responsibility" to implement an INRMP.

The ED is responsible for identifying personnel requirements to accomplish INRMP goals and objectives. The ED is also responsible for providing input into this process by allocating existing budgetary and personnel resources and then identifying staffing needs based on any additional current and future projects. Personnel assigned to natural resources management are the core staff responsible for implementing the INRMP. These personnel ensure that a consistent conservation program is carried out by using strategies outlined in this plan to support the Navy mission and achieve INRMP goals and objectives.

The following staffing is required to implement this INRMP at SNI:

- Terrestrial Ecologist
- Marine Ecologist
- Biological Technician
- Environmental Protection Specialist (NEPA)

6.1.4 Personnel Training

Properly trained personnel are required to achieve objectives and guidelines of this INRMP. Environmental staff members entrusted with this work must have a thorough knowledge and understanding of biology and natural resources, as well as administrative duties such as project management, reporting, and contracting. Periodically, additional training is needed to keep personnel updated on the current practices and advances in knowledge of these topics. This training may be obtained from a variety of sources, including universities, regulatory agencies, professional societies, and other Navy or military organizations. These training opportunities may be offered in the forms of structured courses or conferences, workshops, and symposia. San Nicolas Island will evaluate the following annual workshops or professional conferences for attendance depending on funding available for travel and training:

- National Military Fish and Wildlife Association annual workshop;
- North American Natural Resources Conference; and
- PIF national, regional, and state meetings (generally in conjunction with other listed meetings).

Other conferences/workshops will be evaluated for their usefulness, and decisions will be made based on appropriateness to ongoing projects and funding availability. Projects, which are especially useful, are GPS, GIS, and endangered species training.

The Wildlife Society, Society for Ecological Restoration, the Society for Conservation Biology, and National Military Fish and Wildlife Association are among the professional societies applicable to meeting the needs of SNI's natural resources managers. Membership in these societies is encouraged. The Wildlife Society has some of the best scientific publications in the profession, and literature review is a necessary commitment to maintain standards. Attending meetings of these societies provides excellent opportunities to communicate with fellow professionals as well as maintain professional standards.

Objective and Strategies for Personnel Training

Objective: Continue to improve the success of natural resources management activities through professional development and information exchange.

I. Maintain staff knowledge of management strategies through training and participation in or hosting workshops, research presentations, and other activities of regional, interstate, and international professional natural resources research and conservation programs.

II. Share information with natural resources experts to ensure maximum benefits of adaptive management and research efforts.

6.2 Adaptive Management

6.2.1 Annual Update, Review and Metrics

U.S. Department of Defense policy requires installations to review INRMPs annually in cooperation with the two primary partnering parties to the INRMP: USFWS and the state fish and wildlife agency. Annual reviews facilitate "adaptive management" by providing an opportunity to review the goals and objectives of the plan, as well as establish a realistic schedule for undertaking proposed actions. In addition to tracking the implementation of the INRMP, an annual report is to be provided that briefly summarizes the project and activities that have been implemented during the fiscal year and how these fulfill the objective identified in the INRMP.

Section 101(b)(2) of the SAIA [16 USC 670a(b)(2)] specifically directs that the INRMPs be reviewed "as to operation and effect" by the primary parties "on a regular basis, but not less often than every five years," emphasizing that the review is intended to determine whether existing INRMPs are being implemented to meet the requirements of the SAIA and contribute to the conservation and rehabilitation of natural resources on military installations. The OUSD guidance (17 May 2005) states that joint review should be reflected in a memo or letters.

Recent guidance on INRMP implementation interpreted that the five-year review would not necessarily constitute a "revision," that this would occur only if deemed necessary. The Annual Review process is broadly guided by the Real Estate Manual (USDOD4715.DD-R 1996) and by OPNAVINST 5090.1C, Environmental and Natural Resources Program Manual (30 October 2007). Policy memoranda in 2002, and supplemented in 2004, clarified procedures for INRMP reviews and revisions:

- DUSD[I&E] Policy Memorandum 10 October 2002, which replaced a 1998 policy memorandum.
- ADUSD ESOH Policy Memorandum (01 November 2004).

The INRMP Implementation Guidance (10 October 2002 Memorandum) improved coordination external to USDOD (USFWS, state agencies, and the public) and internal to USDOD (military operators and trainers, cultural resources managers, pest managers). It also added new tracking procedures, called metrics, to ensure proper INRMP coordination occurred and that projects were implemented.

The 2002 guidance also required that each installation provide a notice of intent to prepare or revise the INRMP. Each military installation now must request that USFWS and the state fish and wildlife agency participate in both the development and review of the INRMPs. Current coordination guidelines are that the USFWS field office is the appropriate entry point for military installations, and the USFWS Regional Sikes Act Coordinator is the liaison to facilitate INRMP review.

The Supplemental USDOD INRMP Guidance (01 November 2004 Memorandum) further defined the scope of the annual and five-year review, public comment on INRMP reviews, and ESA consultation. A formal review must be performed by "the parties" at least every five years. Informal annual reviews are mandatory to facilitate adaptive management, during which INRMP goals, objectives, and "must fund" projects are reviewed, and a realistic schedule established to undertake proposed actions.

There is no legal obligation to invite the public either to review or to comment upon the parties' mutually agreed upon decision to continue implementation of an existing INRMP without revision. If the parties determine that substantial revisions to an INRMP are necessary, public comment shall be invited in conjunction with any required NEPA analysis.

In most cases INRMPs will incorporate by reference the results of an installation's previous species-by-species ESA consultations, including any reasonable and prudent measures identified in an incidental take statement. Neither a separate biological assessment nor a separate formal consultation should be necessary. Nonetheless, because the INRMP may include management strategies designed to balance the potentially competing needs of multiple species, it may be prudent to engage in informal consultation.

Objectives and Strategies for INRMP Annual Review

Objective: Improve and refine natural resources management by adaptively adjusting success criteria and priorities based on past accomplishments, new risks and threats, new biological information, and changes in policy (USDOD 4715.DD-R 1996).

I. Provide a notice of intent to revise the INRMP to USFWS Field Office and the CDFG if a revision is found necessary. Ensure that the USFWS Regional Sikes Act Coordinator is notified.

II. Comply with recent CNI draft guidance (January 2005) on INRMPs and compliance with SAIA:

- *A.* All INRMPs shall be reviewed annually by the USDOD installation with the cooperation of the USFWS and the state fish and wildlife agency, and others with a stake in the outcome of the INRMP at the discretion of the Conservation Program Manager. Annual reviews shall verify that:
  1. Current information on all conservation metrics is available.
  2. All "must fund" projects and activities have been budgeted for and implementation is on schedule.
  3. All required trained natural resources positions are filled or are in the process of being filled.
  4. Projects and activities for the upcoming year have been identified and included in the INRMP. An updated project list does not necessitate revising the INRMP.
  5. All required coordinations have occurred.
  6. All significant changes in the installation's mission requirements or its natural resources have been identified.

B. Establish a mutually agreed-upon, realistic schedule to undertake proposed actions.

C. The outcome of this joint review should be documented in a memorandum or letter summarizing the rationale for the conclusions the parties have reached. This written documentation should reflect the parties' mutual agreement.

III. Fulfill the reporting requirements of new measures to promote better understanding of the health of Navy conservation programs, using the "INRMP Metrics Builder" as defined by CNI. This set of metrics for Navy natural resources programs measure conservation impacts on installation missions and the success of partnerships with the USFWS and state fish and game agencies as required by the SAIA. See Figure 6-1 for an introduction to the metrics.

A. Conduct a performance measure based self-review annually, based on the Metrics Builder (Figure 6-1). These tables use the Navy and Marine Corps Natural Resources Metrics Builder Reference Guide (04 May 2005) and were updated based on the NAVFAC metrics website in March 2008.

1. Add SNI-specific questions.

2. Ensure long-term threats to the health of habitats, such as sea level rise and aquatic species invasion, are addressed.

3. Develop specific questions to support annual review process from the SNI's perspective.

IV. Track implementation to guide and learn from past experience.

A. Derive the most benefit possible from learning and experience by documenting it and disseminating the information to others.

B. To track the progress of each of the INRMP's strategies, a spreadsheet program (e.g. Paradox, Access) should be constructed and maintained. Fields can be included to help (a) build queries; (b) track progress by location, type, sponsor, year, etc.; and (c) provide different types of reports. This database was developed as part of this INRMP.

C. The GIS database (ARC/INFO) established for this INRMP should be maintained to track updates on various implementation activities, such as results of resource inventories, and locations of restoration projects.

6.3 Budget Considerations

6.3.1 Natural Resources Management Priorities and Funding Classifications

The budget programming hierarchy for this INRMP is based on both USDOD and Navy funding level classifications (see *Section 1.9: Stewardship and Compliance Criteria for Implementing Projects*). The four programming and budgeting priority levels detailed in USDODINST 4715.3 (03 May 1996) Environmental Conservation Programs, implement policy, assign responsibilities, and prescribe procedures for the integrated management of natural and cultural resources on property under USDOD control. Budget priorities are also described in OPNAVINST 5090.1C, Environmental and Natural Resources Program Manual (30 October 2007).

A Quick-Start Guide to the Natural Resources Metrics Builder:

The Natural Resources Metrics Builder has been developed to provide a standard method for the collection and reporting of business metric information for Natural Resources programs. The metrics are used to determine how well we are doing with respect to Natural Resources management and INRMP implementation across Navy/USMC installations.

The Metrics Builder is comprised of seven focus areas. These focus areas include:

1. INRMP Project Implementation
2. Listed Species and Critical Habitat
3. Partnership Effectiveness
4. Fish and Wildlife Management and Public Use
5. Team Adequacy
6. Ecosystem Integrity
7. INRMP Impact on the Installation Mission

Each focus area has three to seven criteria that have been established by Natural Resources managers and will be used to help determine the status of a given functional area within Natural Resources.

1. To begin using Metrics Builder, first select an installation, and then one of the seven focus areas. This will display a scorecard.

2. Next, for the applicable focus areas, please verify that the list of items or indicators in the left-hand column of the scorecard is valid and corresponds to the installation being reviewed.

NOTE: Check only those indicators that apply within the following focus areas:
Partnership Effectiveness, Team Adequacy, and Ecosystem Integrity. All indicators will not apply to all installations.

3. Provide scores as appropriate for each indicator within the focus area with 4 being the highest possible score. The review team should reach a consensus before a score is determined. The review team should discuss, determine, and select the appropriate score under each question on the scorecard. Click on the headings for definitions and explanations related to each question.

If a question does not match up with an indicator in the left-hand column, please select > NA (Not Applicable) in order to skip a question or indicator that does not apply to your installation.

4. When a scorecard is complete, simply select "Submit Scores" at the bottom of the scorecard.

5. The scores are tallied up for each indicator, and an overall weighted score is calculated for the focus area. A color of red, green, or yellow is assigned to each focus area.
Green scores indicate a satisfactory score.
Yellow scores indicate areas of concern that may require further attention or actions.
Red scores indicate potential problem areas that require added attention or actions.
Please complete the entire score cards for each focus area as it pertains to a given installation.

6. **IMPORTANT**: In the case of a yellow or red score, please provide a description of the issue or concern that may require further attention in the "Findings and Recommendations" section.

Figure 6-1. Guide to the Natural Resources Metrics Builder.

Navy Assessment Levels for Assigning Budget Priorities

The Navy assigns an additional assessment level to projects to assist in recognizing appropriate funding sources in Environmental Program Requirements (EPR) exhibits. The following descriptions of Navy Assessment Levels are summarized from the Navy Environmental Requirements Guidebook. After each description is the approximate equivalent USDOD Class.

- **Level 1 (Federal and State Regulation).** Level one requirements are those prescribed by existing laws, regulations, and EOs. These projects/ongoing efforts include responding to applicable federal, state, and local laws and regulations. Level one also includes costs of ongoing compliance, such as manpower, training, travel, and program management [same as USDODINST 4715.3 Classes 0 & I].
- **Level 2 (Navy Policy).** Requirements derived from USDOD and/or Navy policy. These projects/proposed efforts are not mandated by law or other federal, state or local regulations/orders, but reflect implementation of Navy and USDOD policy decisions and initiatives (e.g. PCB elimination) [same as USDODINST 4715.3 Class I].
- **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/permit standards [same as USDODINST 4715.3 Class I].
- **Level 4 (Future Requirements).** Requirements derived from future potential federal, state, or local legislation. These requirements are speculative in nature [same as USDODINST 4715.3 Class II].
- **Level 5 (Leadership Initiatives).** Requirements based on local proactive Navy initiatives not mandated by law, regulation, EO, or policy [same as USDODINST 4715.3 Class III].

Budget priorities for threatened and endangered species management, especially compliance with BOs, receive the ***highest possible*** budgeting priority, and supports the SNI's need to avoid critical habitat designations under Section 4(b)(2) of the ESA (based on three criteria described in *Section 1.9: Stewardship and Compliance Criteria for Implementing Projects*), or Section 4(a)3 of the ESA (exemption from critical habitat designations for national security reasons).

Environmental Readiness Program Assessment Database

Environmental Program Requirements cover multiple subject matter or "business lines" aside from natural and cultural resources. EPRWeb is an optimized online database used to define all programming for the Navy's environmental requirements. EPRWeb records data on project expenditures, and provides immediate, web-based access to requirements entered by the multiple Navy environmental programs, including Environmental Compliance, Pollution Prevention, Conservation, Radiological Controls, and Range Sustainment as related to environmental costs on military ranges. It is the Navy's policy to fully fund compliance with all applicable federal, state, and local laws; EOs; and associated implementing rules, regulations, USDODINSTs and USDODDIRs, and applicable international and overseas requirements (OPNAVINST 5090.1C).

All natural resources requirements are entered into the EPRWeb and are available for review/approval by the chain of command by the dates specified in the Guidance letter that is provided annually by CNO (N45). This database is the source document for determining all programming and budgeting requirements of the Environmental Quality Program. EPRWeb is also the tool for providing the four ERL capabilities used in producing programming and budgeting requirements for the various processes within the budget planning system (*Section 1.9: Stewardship and Compliance Criteria for Implementing Projects*).

Four Navy ERLs have been established to enable capability-based programming and budgeting of environmental funding, and to facilitate capability versus cost trade-off decisions. ERL 4 is considered the absolute minimum level of environmental readiness capability required to maintain compliance with applicable legal requirements.

Implementation Schedule

This INRMP will become effective upon the acceptance and signatory release described in *Section 6.1.1: Responsibility*. Current projects, activities, and plans have been incorporated into the INRMP, as the plan serves as a formal structuring and integration of the existing natural resources management program.

Future work identified herein will be implemented as funding becomes available. Priorities identified in this INRMP will generally determine the order of implementation. The ED will determine what projects and activities are appropriate to initiate, given funding, at any particular time. The INRMP is meant to be flexible, dynamic, and adaptable to the immediate concerns and needs of natural resources management and the Navy mission.

Program Monitoring

The ED will be responsible for oversight and monitoring of the overall program identified within this INRMP. Cooperative projects among different Navy organizations will be monitored by the originating or controlling office as specified prior to project implementation.

6.3.2 External Assistance

Personnel limits have resulted in the need for outside assistance with natural resources programs on SNI. The growth of environmental compliance requirements has increased the need for external assistance, including on-the-ground personnel support.

6.3.2.1 INRMP Partners

Volunteers

Volunteers are a valuable source of personnel assistance at SNI. Volunteers contribute about 1,000 hours of assistance annually to the SNI natural resources program. Volunteers will continue to be an opportunistic source of assistance.

Other Agencies

NBVC recognizes the importance of cooperating with federal and state agencies in addition to private organizations. *Section 1: Introduction* and *Section 5.4: Beneficial Partnerships and Collaborative Resources Planning* identify other agencies and organizations with which SNI has cooperatively worked in recent years. These organizations, particularly this INRMPs signatory partners (USFWS and CDFG) and NPS will continue to assist with implementation of various aspects of this INRMP during the next five years.

University Assistance

Universities are an excellent source of research assistance. San Nicolas Island has used several universities in recent years to help with specialized needs, such as the University of Arizona for GIS development, UC Riverside, UC Davis, and UC Santa Cruz. These remain the most likely sources of assistance with implementation of this INRMP.

Contractor Support

Contractors give SNI access to a wide variety of specialties and fields. Contractors are involved in projects such as NEPA documentation, vegetation surveys, species surveys, management plans, and similar activities.

6.3.2.2 Planned External Support

External support projects are partitioned into two priorities. Many of these projects will be determined by funding availability.

Objective and Strategies for External Assistance

Objective: Use external assistance as needed.

I. Provide funding and support for research and other studies to further SNI natural resources management.

A. Provide personnel to manage certain aspects of the SNI natural resources program.

B. Provide logistics and administrative support for various SNI natural resources programs.

6.4 Funding Sources

In order to implement the various research, surveys, and programs necessary to fulfill the mission of the ED, funding must be identified and acquired. There are several avenues of funding available to the ED, beyond the typical Naval operational budget, that allow the inclusion of additional projects to assist the ED in their mission-related and stewardship endeavors. The ED must continually assess the priority and level of budgetary needs to fulfill Navy and regulatory requirements and to sustain overall program goals. These funding sources are discussed below in general terms, as this process is dynamic and is dependent on the INRMPs continuously developing program.

These programs will be implemented using Navy personnel and program resources as much as possible; however, it is likely that contractors will accomplish many projects. The ED will identify projects that would be accomplished using contract vehicles, with existing contracts being used where possible and appropriate.

For large projects that involve different Navy organizations, representatives of these organizations would coordinate budgeting and scheduling to ensure that the project can be accomplished in the planned timeframe. Large-budget projects may not be completely funded in a fiscal year, requiring incremental funding over the term of the project.

In some cases, smaller, lower-priority projects may be conducted using unspent funds from other tasks or year-end fallout funding. Some projects may be accomplished with little or no funding required, such as those requiring only a change of policy or coordination and effort from volunteer labor. These tasks can be implemented virtually as soon as planning is performed.

Cooperative Ecosystem Studies Units

The Cooperative Ecosystem Studies Units (CESU) program[1] is a working collaboration among federal agencies, universities, state agencies, non-governmental organizations, and other nonfederal institutional partners. The CESU National Network provides multidisciplinary research, technical assistance, and education to resource and environmental managers. Although the overall program is overseen by USDI, one of the participating agencies is USDOD.

Sikes Act Funds

Sikes Act funds are collected via sales of licenses to hunt or fish (USDON 2005a). They are authorized by the Sikes Act and may be used only for fish and wildlife management on the installation where they are collected. San Nicolas Island generates no Sikes Act funds, and none are anticipated unless security and safety conditions change to allow hunting on the installation, which is not anticipated.

1. For more information regarding the CESU program refer to the following website: http://www.cesu.psu.edu.

Legacy Funds

The Legacy Resource Management Program (LRMP) was enacted in 1990 to provide financial assistance to military natural and cultural resources management. The program assists with protection and enhancement of natural resources while supporting military readiness. Legacy projects may involve regional ecosystem management initiatives, habitat preservation efforts, archaeological investigations, invasive species control, and/or monitoring, and predicting migratory patterns of birds and other animals.

The LRMP has three main components: stewardship, leadership, and partnership. Stewardship projects assist the military in sustaining its natural resources. Leadership initiatives provide programs that serve to guide and often become "flagship" programs for other military, scientific, and public organizations. Partnerships provide for cooperative efforts in planning, management, and research.

The LRMP emphasizes five areas:

- Ecosystem approaches to natural resources management to maintain biological diversity and the sustainable use of land and water resources for the military mission and other uses.
- Interdisciplinary approaches that incorporate the often-overlapping goals of natural and cultural resources management. Legacy strives to take advantage of this by sharing management methodologies and techniques across natural and cultural resource initiatives.
- Promoting natural and cultural resources by public and military education and involvement.
- Application of resource management initiatives regionally. The LRMP supports regional efforts between the military and other governmental and non-governmental organizations.
- Finally, development of innovative new technologies to provide more efficient and effective natural resources management.

Operations and Maintenance Funds

Funding sources for the natural resources program are derived from General and Administrative, Operations and Maintenance Navy (O&MN), Major Range Test Facility Base, and input into the Navy EPR system for funding. This primary budgetary source is the basis for maintaining the personnel and core programs inherent to the natural resources program. It is the responsibility of ED to manage the natural resources program budget and funding. Once O&MN funds are appropriated for core personnel and the program, funding can be justified for other project requirements.

Objective and Strategies for Funding

Objective: Adequately fund natural resources planning initiatives.

I. Provide documentation to secure appropriate levels of in-house (overhead) funding to support natural resource management programs.

II. Develop prioritized lists of proposed management efforts to facilitate accomplishment of programs required for compliance with legal mandates and support the military mission.

III. Develop long-range plans and supporting documentation to secure off-site funding.

IV. Continue to request funding from other agencies for programs of mutual benefit.

V. Continue to support scientific, academic, and volunteer efforts to initiate or supplement natural resource management programs.

6.4.1 University Assistance

Universities are an excellent source of research assistance and provide outstanding resource specific expertise. Collaborative investigations performed in conjunction with installation biologist provides the most likely and cost effective sources of assistance with implementation of this INRMP.

6.4.2 Contractor Support

San Nicolas Island may use outside contractors for support in an ever-growing list of project areas. In accordance with Circular No. A-76, the federal government is mandated to use commercial sources to supply the products and services the Government needs. Contractors give the Station access to a wide variety of specialties and fields. Contractors are involved in projects such as NEPA documentation, vegetation surveys, spring and water source surveys and evaluations, species surveys (invertebrates, vertebrates, bats, and slender salamanders), management plans, and similar activities.

6.4.3 Use of Cooperative Agreements

Cooperative agreements are legal relationships between the Navy and states, local governments, institutions of higher education, hospitals, non-profit organizations or individuals. The principal purpose of the relationship is to transfer a thing of value to the state, local government, or other recipient to carry out a public purpose of support or stimulation authorized by a law of the U.S. instead of acquiring (by purchase, lease, or barter) property or services for the direct benefit or use of the U.S. Government. In order to use a cooperative agreement, substantial involvement is expected between the Navy and the state, local government, or other recipient when carrying out the activity contemplated in the agreement. Cooperative agreements provide a mutually beneficial means of acquiring, analyzing, and interpreting natural resources data, which can then be used to inform natural resources management decisions. Cooperative agreements are funded by the Navy and produce information that can be used to help resource managers achieve project-specific compliance with environmental laws. Authorization for cooperative agreements is arranged through NAVFAC.

San Nicolas Island recognizes the importance of cooperating with federal and state agencies, in addition to private organizations. These organizations, particularly this INRMP's signatory partners (USFWS and CDFG), BLM, NPS, and NAVFAC SW, will continue to assist with implementation of various aspects of this INRMP.

6.4.4 Research Funding Requirements

Environmental program funding within the Navy is primarily based upon federally mandated requirements. Consequently, program managers are encouraged to seek outside funding for projects consistent with the INRMP, such as research, that will benefit natural resources on installations, but that are not directly related to federal mandates.

New funding sources should be sought from federal, state, local, and nonprofit organizations with an interest in achieving the goals and objectives of this INRMP in partnership with SNI. Any such funding would need to be consistent with authorization to receive and use such funds. These will often require cost-sharing. This funding opportunity should be sought for projects that are not Navy Class 0 or 1 "must fund" items, tied directly to immediate regulatory compliance. Examples are watershed management, habitat enhancement, or wetland restoration.

6.4.5 Department of Defense Funding Sources

The costs of executing INRMP actions may be funded from a variety of USDOD sources. The primary funding sources to Navy natural resources programs include:

1. **Operations and Maintenance, Navy Environmental Funds.** Environmental funds are a subcategory of O&MN funds. Environmental funds are primarily used for compliance-related needs.The majority of natural resource projects are

funded with O&MN environmental funds. These appropriated funds are the primary source of resources to support must-fund, just-in-time environmental compliance, i.e. Navy Level 1 projects. Operations and Maintenance Navy funds are generally not available for Navy Level 2-5 projects.

2. The **USDOD Legacy Resource Management Program** is a special Congressionally mandated initiative to fund military conservation projects. Although the LRMP was originally only funded from 1991 to 1996, funds for new projects have continued to be available through this program. The LRMP can provide funding for a variety of conservation projects, such as regional ecosystem management initiatives, habitat preservation efforts, archaeological investigations, invasive species control, monitoring and predicting migratory patterns of birds and animals, and national partnerships and initiatives.
3. **Forestry Revenues.** Revenues from the sale of forest products on Navy lands are a source of funding for natural resource management programs.
4. **Agricultural Outleasing.** Funds accumulated through the outleasing of agricultural lands on many installations are directed back into the natural resource program and reallocated throughout the Navy by NAVFAC Headquarters. These are the broadest use funds available exclusively to natural resource managers.
5. **Fish and Wildlife Fees**.
6. **Recycling Funds.** Installations with a Qualified Recycling Program (QRP) may use proceeds for some types of natural resource projects.
7. **Special Initiatives.** The USDOD or Navy may establish special initiatives to fund natural resource projects. Funding is generally available only for a limited number of projects. There are currently two such USDOD initiatives:
   - *Streamside Forests:* Lifelines to Clean Water is a USDOD streamside restoration small grants program. Funds are available to military installations working in partnership with a local school and/or civic organization to purchase locally native plant material for small streamside restoration projects. Funds are distributed as reimbursements. Up to $5,000 may be awarded per project. This is an ongoing program (no deadline), so proposals can be submitted at any time. Applications and additional information are available on the DENIX website.[1]
   - *Sustaining Our Forests, Preserving Our Future* is funding to ensure that the integrity of USDOD forested lands remains intact.

6.5 INRMP Implementation Summary and Schedule

The objectives and strategies that support INRMP implementation are identified in this section. Following these objectives and management strategies are Table 6-1, Table 6-2, Table 6-3, and Table 6-4 that summarize various aspects of the implementation of this INRMP.

The purpose of Table 6-4 is to summarize all the projects or activities that NBVC intends to implement over the duration of the INRMP time frame. Table 6-4 is organized according to INRMP management topic. Management strategies presented in *Section 4: Natural Resource Management Objectives and Strategies*, *Section 5: Sustainability and Compatible Use at San Nicolas Island*, and *Section 6: Implementation Strategy* identify the means by which NBVC intends to achieve desired future conditions. Management actions, such as EPR projects, are specific projects or activities that provide NBVC a mechanism to strive towards achieving those desired future conditions. Individual EPR projects may address multiple management strategies encompassing various INRMP management topics. In order to reduce redundancy, management strategies are incorporated by reference in the "INRMP Management Strategy" column of the table. Management topics that do not appear as a heading in the table are identified in the "INRMP Management Strategy" column numerically and referenced to an EPR project that may encompass several topic areas. Also, management strategies that pertain to special status species have

■ **For more information on the implementation schedule from 2011-2030 refer to Appendix C.**

1. Available online at: http://www.denix.osd.mil/denix/Public/News/Earthday98/Grants/grants.html.

their own sections rather than including special status species management strategies in the broader sections that pertain to wildlife populations. This Implementation Table parallels the structure of the INRMP as presented in Section 4, Section 5, and Section 6 and all INRMP management strategies presented in these Sections are referenced in the "INRMP Management Strategy" column in this table.

Table 6-1 identifies the various EPR project codes and descriptions that are referenced in the "EPR Project Code" column of Table 6-4; these include the EPR number or place-holder for future EPR projects (e.g., 63126-EPR-Dune) if appropriate. Table 6-2 identifies the applicable funding sources for each project; for more information on funding sources refer to *Section 6.5: INRMP Implementation Summary and Schedule*. Table 6-3 identifies the applicable INRMP legal drivers, or compliance requirements, for all of the various INRMP management projects or activities. All projects listed in Table 6-4 support compliance with OPNAVINST 5090.1C and USDODINST 4715.3, which causes all INRMP management projects to be categorized at a minimum of Budget Priority/Class Level 2.

Objectives and Strategies for INRMP Implementation

Objective: Provide the organizational capacity, communication, planning functions, staffing, budgeting, and innovative technology support to ensure compliance with environmental laws, stewardship of natural resources, and continued use of San Nicolas Island's lands by the Navy.

Objective: Ensure that all appropriate avenues and partnerships are investigated and sought for achieving the goals and objectives of this INRMP, for the best possible management and most efficient use of funds.

I. Seek a balanced, multiple-use natural resources program through professional management (Real Estate Operations and Natural Resources Management Procedural Manual NAVFAC P-73 Volume II 1987).

- *A.* Ensure environmental staff receive ongoing training and professional development through attendance at workshops, classes, training, and conferences.

II. Identify and ensure departments prioritize and allocate funding to support compliance requirements.

- *A.* Funds will be requested for tasks within the INRMP, with priority given to Class I, II, and III projects, in that order, based on guidance in USDODINST 4715.3 *Environmental Conservation Program.*
- *B.* "Must fund" conservation requirements are those projects and activities that are required to meet recurring natural and cultural resources conservation management requirements (Class 0) or current compliance (Class 1 and 2) needs. Navy "must fund" projects and actions include those required to:
  1. Meet with legislative directive, EOs, and any legal requirement supported by laws and regulations found, but not limited to:
     - *a.* Federally threatened and endangered species surveys.
     - *b.* Baseline wetland delineations.
     - *c.* Mapping of federally threatened and endangered species.
     - *d.* Mapping of critical habitat.
  2. Meet the USFWS special management criteria for threatened and endangered species management and avoidance of critical habitat designation on military bases.
  3. Integrally support mission readiness, training requirements, and land sustainability. Examples include:
     - *a.* Prevention of resource loss or degradation (e.g. soil loss, erosion control).
     - *b.* Baseline data collection and long-term trend monitoring efforts.
  4. Provide for qualified natural resources personnel.

C. Identify new funding sources from federal, state, local, and nonprofit organizations with an interest in achieving the goals and objectives of this INRMP in partnership with SNI. These often require cost-sharing with a non-federal organization. This funding opportunity should be sought for projects that are not Class 0 or 1 "must fund" items, tied directly to regulatory compliance. Examples are watershed management, habitat enhancement, or wetland restoration.

D. Support the mutual goals and objectives of this INRMP and the California WAP, as well as a local NCCP, through partnership funding.

E. Monitor websites that keep track of funding opportunities for environmental stewardship.

F. Apply for grants in partnership with local non-profits or other agencies.

III. Seek awards for natural resource work conducted at SNI.

IV. Continue to ensure effective communication, adaptive oversight and policy leadership through the USDON Natural Resources Strategic Plan.

Table 6-1. Integrated Natural Resources Management Plan Environmental Program Requirements Project Codes and Descriptions.

EPR Project Code	Description
6923224086	Feral Cat Removal
69232XXX90	Invasive exotic plant eradication
63126XXX85	Island night lizard survey
63126XXX86	Brown pelican and seabird surveys
63126XXX87	Wetland delineation
63126XXX88	Pinniped monitoring
63126XXX89	Vegetation survey
63126XXX97	Terrestrial invertebrate management activities
63126B0067	Bat management activities
63126XXX93	Island fox management activities
63126B003	Endangered species management activities
69232B0094	Revision of SNI INRMP
63126EPRClimateChange	Climate change vulnerability assessment
63126EPRErosion	Erosion control plan
63126EPRFire	Wildland fire management plan
63126EPRDune	Dune drift management plan
63126EPRMarine	Marine resource management activities
63126EPRBird	Migratory and resident bird management activities
63126EPRBlackAb	Black abalone management activities
63126EPRRare Plant	Rare plant management activities
63126EPRMarine Invasives	Marine aquatic invasive species management activities
63126EPRLandscape	Landscaping and grounds maintenance plan and instruction
63126EPREducation	Environmental education activities

Table 6-2. Integrated Natural Resources Management Plan Project Funding Sources.

Funding Sources	Description
NBVC NR In House	NBVC natural resource program funding
NBVC Other Navy In House	NBVC Public Works or other NBVC Department or Division funding
O&MN	Operations and Maintenance Navy funding
Navy Tenant	NBVC Naval tenant funding
Naval Air Operations	Naval Air Operations funding
Research Institutions	Research institution, non-governmental organization, or volunteer funding
Project Proponent	Project proponent funding

Table 6-3. Integrated Natural Resources Management Plan Implementation Table Management Project or Activity Legal Drivers.

Acronym	Description
ASBS	Area of Special Biological Significance Requirement
BEPA	Bald Eagle Protection Act
BLM MOU No CA-939-08-02	BLM and U.S Navy Memorandum of Understanding for the California Coastal National Monument
BO 1-8-01-F-14	Biological Opinion for Activities on San Nicolas Island, California
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
EFH	Essential Fish Habitat
EO 11988	Floodplain Management
EO 11514	Protection and Enhancement of Environmental Quality
EO 11990	Protection of Wetlands
EO 11991	Protection and Enhancement of Environmental Quality
EO 12342	Environmental Safeguard for Animal Damage Control on Federal Lands
EO 12962	Recreational Fisheries
EO 13101	Greening the Government Through Waste Prevention, Recycling, and Federal Acquisition
EO 13112	Invasive Species
EO 13123	Greening the Government Through Efficient Energy Management
EO 13148	Greening the Government Through Leadership in Environmental Management
EO 13158	Marine Protected Areas
EO 13423	Strengthening Federal Environmental, Energy, and Transportation Management
ESA	Endangered Species Act
FNWA	Federal Noxious Weed Act
LRPPA	Legacy Resource Protection Program Act
MBTA	Migratory Bird Treaty Act
MMPA	Marine Mammal Protection Act
NEPA	National Environmental Policy Act
OPNAVINST 5090.1C	Environmental Protection and Natural Resources Manual
OPPA	Oil Pollution Prevention Act
RCRA-HSWA	Resource Conservation and Recovery Act - Hazardous and Solid Waste Amendments
SCA	Soil Conservation Act
SAIA	Sikes Act Improvement Act
USDODINST 4715.3	US DOD Environmental Conservation Program
USDODINST 6055.06	US DOD Fire and Emergency Services Program
WPFPA	Watershed Protection and Flood Prevention Act

Table 6-4. Integrated Natural Resources Management Plan Implementation Summary, including the assignment of priorities based on legal driver behind each project .

INRMP Management Strategy	Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level	Legal Driver	Implementation		Natural Resources Metrics Builder	Desired Future Condition
						Frequency	Year		
4.0			*Natural Resource Management Objectives and Strategies*						
4.1			*Ecosystem Approach*						
4.1 (VI)	O&MN	69232B0094	INRMP revisions and associated EA to incorporate current resources and management knowledge.	1	SAIA	Annual	2011 - 2030	1. INRMP Project Implementation 2. Listed Species and Critical Habitat 3. Partnership Effectiveness 4. Fish and Wildlife Management and Public Use 5. Team Adequacy 6. Ecosystem Integrity 7. INRMP Impact on Installation Mission	Maintain populations of special status species and species diversity.
4.1 (I, II, III)	NBVC NR In House		Apply sustainability principles to the management of habitats, species, and ecological functions on SNI by identifying resource specific best practices similar to SSI approaches.	1	SAIA, NEPA, CWA, EO 13148, EO 13101, EO 11514, EO 11991	Annual	2011 - 2030	2. Listed Species and Critical Habitat 6. Ecosystem Integrity	Maintain populations of special status species and species diversity.
4.2			*Managing the Physical and Chemical Environment*						
4.2.1			*Water Resources/Water Quality*						
4.2.1. (I, II, III)	NBVC Other Navy In House		Update as needed and implement Storm Water Pollution Prevention Plan.	1	SAIA, CWA, CZMA, ASBS	Five Years	2015, 2020, 2025, 2030	6. Ecosystem Integrity	Capability of access to natural groundwater supply and monitoring its condition.
4.2.2			*Soil Conservation*						
4.2.2 (I, II, III, V) 4.3.1 (VI) 4.3.1.1 (IV) 4.5.2.1 (IV)	O&MN	63126EPR Erosion	Develop and implement an erosion control plan.	1	SAIA, SCA, CWA, CZMA	Five Years	2015, 2020, 2025, 2030	6. Ecosystem Integrity	Develop program to evaluate soil conditions in order to understand conservation needs.
4.2.3			*Wildland Fire Management*						
4.2.3 (I, II, III, IV, V) 4.3.1.4 (I)	O&MN	63126EPRFire	Develop and implement a Wildland Fire Management Plan (WFMP) for SNI.	1	SAIA, USDODINST 6055.6	Five Years	2015, 2020, 2025, 2030	6. Ecosystem Integrity	Develop program to manage wildland fire.
4.3			*Management of Habitats and Plant Communities*						
4.3.1			*Terrestrial Vegetation Communities*						
4.2.2 (IV, VI, VII, VIII) 4.3.1 (I, V, VII, IX, X) 4.3.1.1 (I, II, III, V) 4.3.1.3 (I) 4.3.1.5 (I)	O&MN	63126XXX89	Inventory plant species diversity, abundance, and density to develop priorities for monitoring that establishes ranking system, sensitive species habitat, and creates criteria for restoration work while define the extent, nature, and value of vegetation resources of SNI.	1	SAIA, ESA, LRPPA	Five Years	2015, 2020, 2025, 2030	2. Listed Species and Critical Habitat 6. Ecosystem Integrity	Implement standard protocol and quantify existing habitat areas for management consideration.

Table 6-4. Integrated Natural Resources Management Plan Implementation Summary, including the assignment of priorities based on legal driver behind each project (Continued).

INRMP Management Strategy	Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level	Legal Driver	Implementation		Natural Resources Metrics Builder	Desired Future Condition
						Frequency	Year		
4.3.1.6			*Beach and Dune - Stabilized and Drifting Dunes*						
4.3.1.6 (II, III)	O&MN	63126EPR Dune	Develop and implement a dune drift management plan to determine effective alternatives to manage dune drift impact to roads, operations, and natural resources.	1	SAIA, CZMA, LRPPA	Five Years	2015, 2020, 2025, 2030	6. Ecosystem Integrity	Develop program to manage drifting dunes.
4.3.2			*Jurisdictional Waters - Wetlands*						
4.3.2 (I)	O&MN	63126XXX87	Maintain a current inventory of wetlands to support planning and management efforts to achieve no net loss of wetlands.	1	SAIA, CWA, CZMA, EO 11990	Five Years	2015, 2020, 2025, 2030	6. Ecosystem Integrity	No net loss of wetlands.
4.3.2 (II)	NBVC NR In House		Protect the natural ecological integrity, structure, and functional values of the wetlands and floodplains on SNI.	1	SAIA, CWA, CZMA, LRPPA, WPFPA, EO 11990	Annual	2011 - 2030	6. Ecosystem Integrity	No net loss of wetlands.
4.3.3			*Coastal and Marine Habitats and Communities*						
4.3.3.1			*Sandy Beaches*						
4.3.3.1 (I)	O&MN	63126EPR Marine	Collect baseline information and establish monitoring protocols for sandy beach communities to support management to maintain habitat integrity.	1	SAIA, CZMA, ESA, CWA, ASBS	Two Years	2012, 2014, 2016, 2018, 2020, 2022, 2024, 2026, 2028, 2030	6. Ecosystem Integrity	Establish baseline information on the status and condition of key species.
4.3.3.2			*Rocky Intertidal Community*						
4.3.3.2 (I, II)	O&MN	63126EPR Marine	Continue rocky intertidal surveys and encourage additional monitoring at SNI consistent with monitoring performed at the other Channel Islands and throughout California, to establish regional trends and understand site specific change.	1	SAIA, CZMA, ESA, CWA, ASBS	Two Years	2012, 2014, 2016, 2018, 2020, 2022, 2024, 2026, 2028, 2030	6. Ecosystem Integrity	Establish baseline information on the status and condition of key species.
4.3.3.3 *4.3.3.4*			*Nearshore Waters - Unvegetated Soft Bottom and Vegetated Soft Bottom*						
4.3.3.3 (I) 4.3.3.4 (I)	O&MN	63126EPR Marine	Develop and implement unvegetated and vegetated soft bottom monitoring protocols at SNI to determine resource status and extent of submerged aquatic vegetation (eelgrass).	1	SAIA, CZMA, ESA, CWA, ASBS	Two Years	2012, 2014, 2016, 2018, 2020, 2022, 2024, 2026, 2028, 2030	6. Ecosystem Integrity	Establish baseline information on the status and condition of key species.
4.3.3.5			*Nearshore Waters - Rocky Reefs and Kelp Forests*						
4.3.3.5 (I)	O&MN	63126EPR Marine	Support establishment of kelp forest ecosystem monitoring locations around SNI while encouraging state and federal agencies and academic researchers to investigate important community related questions involving recruitment, disturbance, and species diversity that help to assess regional trends.	1	SAIA, CZMA, ESA, CWA, EFH, ASBS	Two Years	2012, 2014, 2016, 2018, 2020, 2022, 2024, 2026, 2028, 2030	6. Ecosystem Integrity	Establish baseline information on the status and condition of key species.

Table 6-4. Integrated Natural Resources Management Plan Implementation Summary, including the assignment of priorities based on legal driver behind each project (Continued).

INRMP Management Strategy	Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level	Legal Driver	Implementation		Natural Resources Metrics Builder	Desired Future Condition
						Frequency	Year		
4.3.3.6			*Offshore Rocks*						
4.3.3 (III, IV) 4.3.3.6 (I)	NBVC NR In House		Develop management strategies through partnerships with the BLM to support the management of the Begg Rock State Marine Reserve and of the offshore rocks near SNI and Begg Rock that are designated as part of the CCNM.	1	SAIA, CZMA, BLM MOU No. CA-939-08-02	Two Years	2012, 2014, 2016, 2018, 2020, 2022, 2024, 2026, 2028, 2030	3. Partnership Effectiveness	Establish baseline information on the status and condition of key species.
4.4			*Fish and Wildlife Management*						
4.4.1			*Terrestrial Invertebrates (excluding special status species)*						
4.4.1 (I)	O&MN	63126XXX97	Collect baseline information on the invertebrate community of SNI, with particular emphasis on endemics and pollinators.	1	SAIA, ESA	Three Years	2013, 2016, 2019, 2022, 2025, 2028	2. Listed Species and Critical Habitat 6. Ecosystem Integrity	Collect baseline information on the status and condition of key species.
4.4.2			*Reptiles and Amphibians (excluding special status species)*						
4.4.2 (I, II, III)	O&MN	63126XXX85	Conduct regular monitoring of reptiles and amphibians in addition to island night lizard monitoring and develop accurate GIS data layers for known populations and conserve habitat associations to avoid sensitive areas and minimize potential impacts.	1	SAIA, ESA	Annual	2011 - 2030	2. Listed Species and Critical Habitat 6. Ecosystem Integrity	Maintain populations of special status species and species diversity.
4.4.3			*Birds - Migratory and Resident Birds (excluding special status species)*						
4.4.3 (I, II, V, VI, VII, VIII, X)	O&MN	63126EPR Bird	Migratory and resident bird inventory and restoration management activities to conserve bird population and develop and maintain information on status and trend of population and habitats.	1	SAIA, ESA, MBTA, BEPA	Annual	2011 - 2030	3. Partnership Effectiveness 6. Ecosystem Integrity	Maintain populations of special status species and species diversity.
4.4.3 (IX)	O&MN	63126XXX86	Monitor resident seabird populations and breeding colonies to track the sustainability of populations and their habitat.	1	SAIA, ESA, MBTA	Annual	2011 - 2030	6. Ecosystem Integrity	Maintain populations of special status species and species diversity.
4.4.3 (III)	NBVC NR In House		Implement bird conservation principles, measures, and practices through avoidance and minimization measures to protect resident and migratory bird populations.	1	SAIA, ESA, MBTA, BEPA	Annual	2011 - 2030	6. Ecosystem Integrity	Maintain populations of special status species and species diversity.
4.4.4			*Terrestrial Mammals (excluding special status species)*						
4.4.4 (I, II)	Research Institutions		Support small mammal monitoring programs at SNI to adapt management strategies based on current population status.	1	SAIA, ESA	Three Years	2013, 2016, 2019, 2022, 2025, 2028	6. Ecosystem Integrity	Maintain populations of special status species and species diversity
4.4.4 (III)	O&MN	63126B0067	Inventory and monitor bat populations on SNI to adapt management strategies based on current population status.	1	SAIA	Annual	2011 - 2030	6. Ecosystem Integrity	Maintain populations of special status species and species diversity.
4.4.5			*Marine Macroalgae and Plants*						
4.4.5 (I, II)	O&MN	63126EPR Marine	Collect community level marine macroalgae baseline information surveys to support focused management efforts and identify indicator species. Survey subtidal and intertidal areas near high use locations (pier and barge landing areas) for the introduction of non-native invasive species.	1	SAIA, CZMA, ASBS, EO 13112	Two Years	2012, 2014, 2016, 2018, 2020, 2022, 2024, 2026, 2028, 2030	6. Ecosystem Integrity	Establish baseline information on the status and condition of key species.

Table 6-4. Integrated Natural Resources Management Plan Implementation Summary, including the assignment of priorities based on legal driver behind each project (Continued).

INRMP Management Strategy	Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level	Legal Driver	Implementation		Natural Resources Metrics Builder	Desired Future Condition
						Frequency	Year		
4.4.6			*Marine Invertebrates (excluding special status species)*						
4.4.6 (I)	O&MN	63126EPR Marine	Develop and implement a marine resource stewardship plan.	1	SAIA, ESA, CZMA	Five Years	2015, 2020, 2025, 2030	2. Listed Species and Critical Habitat 6. Ecosystem Integrity	Establish baseline information on the status and condition of key species.
4.4.7			*Fishes*						
4.4.7 (I)	O&MN	63126EPR Marine	Develop a fish monitoring program and management plan to conserve fish population abundance and habitat diversity.	1	SAIA, CZMA, EFH	Three Years	2013, 2016, 2019, 2022, 2025, 2028	6. Ecosystem Integrity	Establish baseline information on the status and condition of key species.
4.4.8			*Marine Mammals (excluding special status species)*						
4.4.8 (I, II, III)	O&MN	63126XXX88	Monitor island-wide pinniped breeding and haul out sites and periodic evaluation of current adaptive management practices.	1	SAIA, ESA, CZMA, MMPA	Annual	2011 - 2030	2. Listed Species and Critical Habitat 6. Ecosystem Integrity	Maintain populations of special status species and species diversity.
4.5			*Special Status Species Protection*						
4.5.1			*Federally Listed Species and Critical Habitat*						
4.5.1 (I, III)	Navy Tenant Funded	63126B003	Ensure that land use plans and activities in or near threatened or endangered species habitats are accomplished in accordance with the ESA in accordance with current Biological Opinions and with ESA Section 7 Consultation Handbook (USFWS/NMFS March 1998).	1	SAIA, ESA, BO 1-8-01-F-14	Annual	2011 - 2030	2. Listed Species and Critical Habitat	Maintain populations of special status species and facilitate the eventual delisting of the species.
4.5.1 (II)	O&MN	63126B003	Per USFWS Biological Opinion (2001) provide the USFWS an annual report containing the number of island night lizards, California Brown Pelicans, and Western Snowy Plover killed or injured by Navy activities, and a summary of Navy activities and their effects on listed species. in accordance with the Reporting Requirements in the BO (USFWS 2001).	1	SAIA, ESA, BO 1-8-01-F-14	Annual	2011 - 2030	2. Listed Species and Critical Habitat	Maintain populations of special status species and facilitate the eventual delisting of the species.
4.5.1.1			*Island Night Lizard (Federally Threatened)*						
4.5.1.1 (I, II, III, IV, VI)	O&MN	63126XXX85	Support recovery plan efforts to establish stable island night lizard populations and eventual delisting by conducting site specific surveys prior to disturbance activities, implementing avoidance and minimization measures, and conducting studies to investigate the effectiveness of island night lizard management strategies with respect to impacts from alligator lizards and the relocation island night lizards.	1	SAIA, ESA, BO 1-8-01-F-14	Annual	2011 - 2030	2. Listed Species and Critical Habitat	Maintain populations of special status species and facilitate the eventual delisting of the species.
4.5.1.2			*Western Snowy Plover (Federally Threatened)*						
4.5.1.2 (I)	Navy Tenant Funded	63126B003	Support recovery plan efforts to establish stable western snowy plover populations and eventual delisting by closing nesting areas to recreational activity during the March 1 - September 15 breeding season and by removing unnecessary structures in nesting areas.	1	SAIA, ESA, BO 1-8-01-F-14	Annual	2011 - 2030	2. Listed Species and Critical Habitat	Maintain populations of special status species and facilitate the eventual delisting of the species.

Table 6-4. Integrated Natural Resources Management Plan Implementation Summary, including the assignment of priorities based on legal driver behind each project (Continued).

INRMP Management Strategy	Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level	Legal Driver	Implementation		Natural Resources Metrics Builder	Desired Future Condition
						Frequency	Year		
4.3.3 (II) 4.5.1.2 (II, III, VI)	Navy Tenant Funded	63126B003	Support recovery plan efforts to establish stable western snowy plover populations and eventual delisting by monitoring the effects of Navy activities on snowy plovers through conducting island-wide snowy plover censuses twice annually, once during the breeding season and once during the winter season, and through monitoring snowy plover nests during missile or target launches, general operations, and other activities that may disturb nesting behaviors.	1	SAIA, ESA, BO 1-8-01-F-14	Annual	2011 - 2030	2. Listed Species and Critical Habitat	Maintain populations of special status species and facilitate the eventual delisting of the species.
4.5.1.3			*Black Abalone (Federally Endangered)*						
4.3.3 (I) 4.5.1.3 (I, II, VII)	O&MN	63126EPR BlackAb	Support recovery plan efforts to establish stable black abalone populations through continuing to conduct presence and absence surveys and through developing and implementing annual abalone monitoring protocols.	1	SAIA, ESA, ASBS	Annual	2011 - 2030	2. Listed Species and Critical Habitat	Maintain populations of special status species and facilitate the eventual delisting of the species
4.5.1.3 (IV, V)	O&MN	63126EPR BlackAb	Continue to support appropriate closures at SNI and continue to review all military activities to ensure that they are in compliance with ESA and to avoid or minimize impacts to black abalone.	1	SAIA, ESA, ASBS	Annual	2011 - 2030	2. Listed Species and Critical Habitat	Maintain populations of special status species and facilitate the eventual delisting of the species.
4.5.1.4			*White Abalone (Federally Endangered)*						
4.5.1.4 (I, II, III)	O&MN	63126EPR Marine	Support recovery plan efforts to establish stable white abalone populations by facilitating efforts to identify white abalone habitat and determine densities of individuals around SNI.	1	SAIA, ESA, ASBS	Annual	2011 - 2030	2. Listed Species and Critical Habitat	Establish baseline information on the status and condition of key species.
4.5.1.5			*Guadalupe Fur Seal (Federally Threatened)*						
4.5.1.5 (I, II)	NBVC NR In House / Research Institutions		Support on-going and new research on distribution and ecology of the Guadalupe fur seal. Encourage academic institutions to collect resource data. Record all sightings of Guadalupe fur seals and develop a database to track numbers of individuals, time of year, and location.	1	SAIA, MMPA, ESA	Annual	2011 - 2030	2. Listed Species and Critical Habitat	Establish baseline information on the status and condition of key species.
4.5.2			*Management of Other Special Status Species*						
4.5.2 (I, II)	NBVC NR In House		Provide for the recovery, enhancement, and protection of species warranting Navy stewardship, as a proactive strategy to prevent federal listings and continue to resolve baseline biological data gaps.	1	SAIA, ESA	Annual	2011 - 2030	2. Listed Species and Critical Habitat	Establish baseline information on the status and condition of key species.
4.5.2.1			*Special Status Plants (State Endangered, State Threatened, State Rare, and CNPS Rare, Threatened, and Endangered)*						
4.5.2.1 (I, II, III, V)	O&MN	63126EPR Rare Plant	Collect data on the habitat and reproductive requirements for sensitive endemic plants species for conservation and management efforts.	1	SAIA, ESA	Five Years	2015, 2020, 2025, 2030	2. Listed Species and Critical Habitat	Establish baseline information on the status and condition of key species.
4.5.2.2			*Special Status Terrestrial Invertebrates -* *SNI Coenonycha Beetle (CNDDB Extremely Endangered) and SNI Snails (Federal Species of Concern)*						
4.5.2.2 (I)	O&MN	63126XXX97	Collect baseline information on the special status native invertebrate species of SNI.	1	SAIA, ESA	Three Years	2013, 2016, 2019, 2022, 2025, 2028	2. Listed Species and Critical Habitat	Establish baseline information on the status and condition of key species.

Table 6-4. Integrated Natural Resources Management Plan Implementation Summary, including the assignment of priorities based on legal driver behind each project (Continued).

INRMP Management Strategy	Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level	Legal Driver	Implementation		Natural Resources Metrics Builder	Desired Future Condition
						Frequency	Year		
4.5.2.3			*Xantus's Murrelet (ESA Candidate)*						
4.5.2.3 (I, II)	O&MN	63126EPR Bird	Provide for the recovery, enhancement, and protection of Xantus's murrelets, as a proactive strategy to prevent federal listings and continue to resolve baseline biological data gaps.	1	SAIA, ESA	Annual	2011 - 2030	2. Listed Species and Critical Habitat	Establish baseline information on the status and condition of key species.
4.5.2.4			*Ashy Storm Petrel (ESA Candidate)*						
4.5.2.4 (I, II)	O&MN	63126EPR Bird	Provide for the recovery, enhancement, and protection of ashy storm-petrels, as a proactive strategy to prevent federal listings and continue to resolve baseline biological data gaps.	1	SAIA, ESA	Annual	2011 - 2030	2. Listed Species and Critical Habitat	Establish baseline information on the status and condition of key species.
4.5.2.5			*San Nicolas Island Fox (State Threatened)*						
4.5.2.5 (I, II)	Navy Tenant Funded	63126XXX93	Maintain a viable population of the San Nicolas Island fox by reducing negative, human-caused impacts and remaining an active participant with other agencies regarding island fox issues.	1	SAIA, ESA	Annual	2011 - 2030	2. Listed Species and Critical Habitat	Establish baseline information on the status and condition of key species.
4.5.2.6			*San Nicolas Island Deer Mouse (State Sensitive Species)*						
4.5.2.6 (I, II)	Research Institutions		Determine the status of deer mouse populations and conserve and protect deer mouse habitat.	1	SAIA, ESA	Annual	2011 - 2030	2. Listed Species and Critical Habitat	Establish baseline information on the status and condition of key species.
4.5.2.7			*Southern Sea Otter (ESA Non-Essential Experimental Population)*						
4.5.2.7 (I, II)		63126EPR Marine	Support on-going and new research on distribution and ecology of the southern sea otter at SNI. Encourage academic institutions to facilitate resource data collection and record all sightings of southern sea otters at SNI and develop a database to track numbers of individuals, time of year, and location.	1	SAIA, MMPA, ESA	Annual	2011 - 2030	2. Listed Species and Critical Habitat	Establish baseline information on the status and condition of key species.
4.6			*Invasive Species*						
4.6.1			*Terrestrial Invasive Species*						
4.3.1 (II, III) 4.3.1.2(I) 4.3.1.3 (II) 4.3.1.4 (II) 4.3.1.6 (I) 4.5.2.1 (VI) 4.6.1 (V, VI, VII, XIV)	O&MN	69232XXX90	Update and implement the invasive non-native plant species management and eradication program to insure use of existing BMP's to reduce the introduction of invasive species, establish early detection and rapid response protocol, map and prioritize most problematic terrestrial invasive non-native species populations, and maintain consistency with long-term protection of native plant communities.	1	SAIA, ESA, FNWA, EO 13112	Annual	2011 - 2030	6. Ecosystem Integrity	Develop program to evaluate invasive non-native plant species management and eradication in order to understand conservation needs.
4.4.1 (III) 4.6.1 (I, III, VIII, IX, XIII, XVI) 4.7.2 (IV)	O&MN	6923224086	Develop and implement a biosecurity plan to ensure invasive terrestrial fauna and flora are not brought to SNI by providing prevention, early detection, rapid response, and education guidelines.	1	SAIA, ESA, EO 13112	Annual	2011 - 2030	6. Ecosystem Integrity	Enforce establish defined BMPs and biosecurity measures for invasive species.
4.6.1 (XV)	O&MN	6923224086	Assess and monitor the progress and success of the removal of feral cats to support the shorebird enhancement project.	1	SAIA, ESA, EO 13112	Annual	2011 - 2030	6. Ecosystem Integrity	Enforce invasive species plans to control and manage exotic invasive species invasions.

Table 6-4. Integrated Natural Resources Management Plan Implementation Summary, including the assignment of priorities based on legal driver behind each project (Continued).

INRMP Management Strategy	Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level	Legal Driver	Implementation		Natural Resources Metrics Builder	Desired Future Condition
						Frequency	Year		
4.6.2			*Aquatic Invasive Species*						
4.6.2 (I, II, III) 4.4.5 (III)	O&MN	63126EPR Marine Invasives	Develop and implement a plan to prevent the introduction of invasive non-native marine and coastal species into SNI waters which includes a standardized monitoring system focused on early detection for high priority aquatic invasive species, rapid response protocol, and promotes when an invasive is detected. Promote cooperative interagency efforts to collect and analyze comprehensive monitoring data.	1	SAIA, EO 13112	Annual	2011 - 2030	6. Ecosystem Integrity	Enforce aquatic invasive species measures to control and manage exotic invasive species invasions.
4.7			*Prevention and Control of Wildlife Damage*						
4.7.1			*BASH Program*						
4.4.3 (IV) 4.7.1 (II, III)	Naval Air Operations		Survey and monitor avian species utilizing airfield and document bird strikes and carcasses adjacent to airfield.	1	SAIA, MBTA, EO 12342	Five Years	2015, 2020, 2025, 2030	2. Listed Species and Critical Habitat 6. Ecosystem Integrity 7. INRMP Impact on the Installation Mission	Establish baseline information on the status and condition of BASH species.
4.7.1 (I)	Naval Air Operations		Develop and implement a BASH Plan and conduct a Wildlife Hazard Assessment for SNI.	1	SAIA, MBTA, EO 12342	Five Years	2015, 2020, 2025, 2030	7. INRMP Impact on the Installation Mission	Implement BASH Plan.
4.7.2			*Pest / Predator Control*						
4.7.2 (I, II, III)	NBVC NR In House		Minimize the introduction of pest species to SNI. Develop a rodent control /removal plan and implement if introduced species are detected. Determine presence or absence of non-native rodents.	1	SAIA, EO 12342	Annual	2011 - 2030	6. Ecosystem Integrity	Establish baseline information on the status and condition of pest and predator species.
4.8			*Data Integration, Access, and Reporting*						
4.2.3 (VI), 4.5.1.2 (V), 4.5.1.3 (VI) 4.8 (I, II, III, IV) 5.2.1 (III) 5.13.1 (IX, X)	NBVC NR In House / Research Institutions		Set up a central clearinghouse for data, reports, and publications pertaining to the NBVC's EMS that addresses natural resources, that is accessible to staff, and that is managed by a designated data manager.	1	SAIA, EO 13101	Annual	2011 - 2030	1. INRMP Project Implementation	Develop a database for natural resource activities at SNI.
5.0			*Sustainability and Compatible Use at San Nicolas Island*						
5.1			*Sustainability of the Military Mission in the Natural Environment*						
5.1.1			*Integrated Military Mission and Sustainable Land Use Decisions*						
5.1.1 (I, II, III, IV, VI, VII, VIII, X)	NBVC NR In House		Maintain habitats using principles of ecosystem management and sustainability and continue to use NEPA documentation. Define benefit or impact to the military mission.	1	SAIA, NEPA, EO 13148, EO 11514, EO 11991, EO 11988, EO 13158, EO 11990	Annual	2011 - 2030	7. INRMP Impact on the Installation Mission	Effective natural resource conservation and stewardship while supporting the military mission.

Table 6-4. Integrated Natural Resources Management Plan Implementation Summary, including the assignment of priorities based on legal driver behind each project (Continued).

INRMP Management Strategy	Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level	Legal Driver	Implementation		Natural Resources Metrics Builder	Desired Future Condition
						Frequency	Year		
5.1.2			*Adapting to Effects of Climate Change and Regional Growth*						
4.1 (IV) 5.1.2 (I, II, III, IV, V, VI, VII)	O&MN	63126EPR Climate Change	Control and reduce greenhouse gas emissions by improving governance, implementing the SNI Net Zero Energy Installation Plan, providing energy conservation education, and addressing impacts in NEPA documents.	1	SAIA, EO 13123, EO 13148, EO 13423	Annual	2011 - 2030	6. Ecosystem Integrity 7. INRMP Impact on the Installation Mission	Control and reduce greenhouse gas emissions.
5.1.3			*Sustainability in the Built Environment*						
5.1.3 (I)	NBVC NR In House / NBVC Other Navy In House / Project Proponent		Update and implement the SNI Net Zero Energy Installation Plan to reduce dependency on jet fuel and thereby reducing air and water quality impacts.	1	SAIA, EO 13123, EO 13148, EO 13423	Five Years	2015, 2020, 2025, 2030	6. Ecosystem Integrity	Development of an effective communication strategy.
4.1 (VII, VIII) 5.1.3 (II, III, IV, V, VII, VIII)	NBVC NR In House / Project Proponent		Promote training in sustainable design criteria for Navy staff and apply sustainability principles to the management of natural resources and the built environment by using metrics (indicators) of sustainability and by adopting LEED, LID, and Sustainable Sites Initiative approaches while continuing to use RSIP, master planning, site approval, and NEPA processes.	1	SAIA, EO 13123, EO 13148, EO 13101, EO 11514, EO 11991, EO 13423	Annual	2011 - 2030	6. Ecosystem Integrity 7. INRMP Impact on the Installation Mission	Implement LEED, LID, and Sustainable Site approaches at SNI.
5.1.3 (VI)	NBVC NR In House		Develop and implement a SAP at an organizational level.	1	SAIA	Five Years	2015, 2020, 2025, 2030	6. Ecosystem Integrity	Develop and implement a SAP.
5.2			*Construction and Facility Maintenance*						
4.3.1 (IV) 5.2 (I, II, III, IV)	NBVC NR In House		Establish protocols for emergency and regular repair of infrastructure so that human life, health and safety are given precedence, but sensitive resources are also protected. Consider fish and wildlife conservation in all site feasibility studies and during project planning, design and construction.	1	SAIA, EO 13148, EO 13101, EO 11514, EO 11991, EO 13423	Annual	2011 - 2030	6. Ecosystem Integrity 7. INRMP Impact on the Installation Mission	Maintain populations of special status species and species diversity.
5.2.1			*Road Maintenance*						
5.2.1 (I, II, IV, V) 4.6.1 (XI)	O&MN	63126EPR Road	Develop and implement an Island Road Long-term Maintenance Plan that updates and improves road maintenance best management practices, applies the principles of "Integrated Vegetation Management", and adopts mowing instructions to meet multiple objectives for roadside maintenance to alleviate harmful environmental impacts and enhance possible benefits. Adopt a Mowing Instruction that provides roadside fire safety and minimizes detrimental environmental effects. Comply with CWA Section 404 Permit and Section 401 State Water Quality Certification.	1	SAIA, CWA Section 404 and 401 permits, EO 13423, ASBS	Five Years	2015, 2020, 2025, 2030	6. Ecosystem Integrity 7. INRMP Impact on the Installation Mission	Develop and implement an Island Road Long-Term Maintenance Plan.

Table 6-4. Integrated Natural Resources Management Plan Implementation Summary, including the assignment of priorities based on legal driver behind each project (Continued).

INRMP Management Strategy	Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level	Legal Driver	Implementation		Natural Resources Metrics Builder	Desired Future Condition
						Frequency	Year		
5.3			*Communication Towers, Wind farms, and Power Lines*						
5.3 (I, II, III, IV, V)	NBVC NR In House / Project Proponent		Ensure siting criteria are addressed through the Project Review Board (NBVCINST 11010). Any proposed towers will also comply with USFWS guidelines for reducing fatal bird strikes to the greatest extent practicable.	1	SAIA, NEPA, MBTA, EO 11514	Annual	2011 - 2030	6. Ecosystem Integrity 7. INRMP Impact on the Installation Mission	Utilize the Project Review Board (NBVC 11010).
5.4			*Beneficial Partnerships and Collaborative Resources Planning*						
4.1 (V) 5.1.1 (V)	NBVC NR In House		Participate in conservation, ecosystem, invasive species, and feral animal control planning in collaboration with other government agencies.	1	SAIA	Annual	2011 - 2030	3. Partnership Effectiveness	Participate in collaborative planning efforts with relevant state and federal agencies.
4.3.3.5 (II)	NBVC NR In House		Seek out and encourage partners to support independent scientific research and to develop cooperative research agreements focused on examining marine recruitment processes of important indicator species or species of concern.	1	SAIA	Annual	2011 - 2030	3. Partnership Effectiveness	Participate in collaborative planning efforts with relevant state and federal agencies.
4.5.2.5 (III) 4.5.2.6 (III)	NBVC NR In House		Remain an active participant with other agencies regarding San Nicolas Island fox and San Nicolas Island deer mouse issues.	1	SAIA	Annual	2011 - 2030	3. Partnership Effectiveness	Participate in collaborative planning efforts with relevant state and federal agencies.
4.6.1 (XVII)	NBVC NR In House		Support the integration of SNI into the Invasive Species Task Force on Santa Cruz Island and other Channel Islands as opportunities arise.	1	SAIA	Annual	2011 - 2030	3. Partnership Effectiveness	Participate in collaborative planning efforts with relevant state and federal agencies.
4.6.2 (IV)	NBVC NR In House		Promote cooperative interagency efforts to collect and analyze comprehensive aquatic invasive species monitoring data, including shared funding and staff.	1	SAIA	Annual	2011 - 2030	3. Partnership Effectiveness	Participate in collaborative planning efforts with relevant state and federal agencies.
5.4 (I, II, III, IV)	NBVC NR In House		Consult with USFWS and CDFG at least annually to fulfill SAIA provisions and related inter-agency cooperative agreements.	1	SAIA	Annual	2011 - 2030	3. Partnership Effectiveness	Participate in collaborative planning efforts with relevant state and federal agencies.
5.13.1 (IV)	NBVC NR In House		Consider the use of Cooperative Agreements to get work done, especially research. A long-term advisory relationship and cooperative research relationship could continue with local universities.	1	SAIA	Annual	2011 - 2030	3. Partnership Effectiveness	Participate in collaborative planning efforts with relevant state and federal agencies.
5.5			*Public Access*						
5.5 (I, II)	NBVC NR In House		Establish and implement clear, coherent policies regarding public access to SNI including the near short environment. Take active measures to discourage trespass and minimize the impacts of unauthorized access.	1	SAIA	Annual	2011 - 2030	4. Fish and Wildlife Management and Public Use	Establish policies for public access to SNI.
5.6			*Public Outreach*						
5.6 (I, II)	NBVC NR In House		Identify natural resource themes for public outreach. Participate in Earth Day and annual science festivals that occur in adjacent communities on the mainland.	1	SAIA	Annual	2011 - 2030	4. Fish and Wildlife Management and Public Use	Develop a public outreach program.
5.7			*Consistency with Other Plans*						

Table 6-4. Integrated Natural Resources Management Plan Implementation Summary, including the assignment of priorities based on legal driver behind each project (Continued).

INRMP Management Strategy	Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level	Legal Driver	Implementation		Natural Resources Metrics Builder	Desired Future Condition
						Frequency	Year		
5.13.1 (V)	NBVC NR In House		Ensure consistency with Coastal Zone Plans.	1	SAIA	Annual	2011 - 2030	3. Partnership Effectiveness	Coastal Zone Plan consistency.
5.7.1			*Consistency with Integrated Cultural Resource Management Plan*						
5.7.1 (I, II, III)	NBVC NR In House		Continue to participate in the Project Review Board and the Site Approval and Project Review Process and coordinate with the Cultural Resources program.	1	SAIA	Annual	2011 - 2030	1. INRMP Project Implementation	Participate in collaborative planning efforts with NBVC Cultural Resource management program.
5.8			*NEPA Compliance*						
4.6.1 (X) 5.1.1 (IX) 5.8 (I, II, III, IV)	NBVC NR In House		Continue to use NEPA planning processes and documentation to guide specific projects and document choices and enforce mitigation measures proposed in those NEPA documents.	1	SAIA, NEPA, EO 11514	Annual	2011 - 2030	1. INRMP Project Implementation	Comply with NEPA requirements.
5.9			*Stormwater Management*						
5.9 (I) 5.14 (III)	NBVC NR In House		Revise and implement the Storm Water Pollution Prevention Plan and water quality protection efforts throughout the SNI watershed.	1	SAIA, CWA, ASBS	Five Years	2015, 2020, 2025, 2030	6. Ecosystem Integrity	Implement the Storm Water Pollution Prevention Plan.
5.10			*Remediation of Contaminated Sediment*						
5.10 (I, II, III, IV)	NBVC NR In House		Collect and distribute data on sediment contamination to minimize risks to recreational and commercial water contact users, recreational and commercial fisheries, and to wildlife species.	1	SAIA, RCRA-HSWA, EO 13101, ASBS	Three Years	2013, 2016, 2019, 2022, 2025, 2028	6. Ecosystem Integrity	Monitor sediment contamination.
5.11			*Oil Spill or Hazardous Substance Prevention and Cleanup*						
5.11 (I, II, III)	NBVC NR In House		Integrate the protection priorities of this INRMP into the Emergency Response Action Plan and the Integrated Contingency Plan for Oil and Hazardous Substance Spill Prevention and Response.	1	SAIA, OPPA	Five Years	2015, 2020, 2025, 2030	6. Ecosystem Integrity	Implement the Emergency Response Action Plan and the Integrated Contingency Plan.
5.12			*Cumulative Effects*						
5.12 (I, II, III, IV, V)	NBVC NR In House		Support research to improve the adequacy of cumulative effects analysis, standardize the format in documents, and develop and implement compensation for cumulative effects.	1	SAIA, NEPA, EO 11514	Annual	2011 - 2030	1. INRMP Project Implementation	Maintain NEPA compliance.
5.12.1			*Shoreline Construction*						
5.12.1 (I, II, III, IV, V)	NBVC NR In House		Conserve existing habitat values by promoting experimentation and application of alternative shoreline and underwater habitat structures. Encourage refitting of developed shorelines and existing structures to enhance habitat values.	1	SAIA, CZMA	Annual	2011 - 2030	6. Ecosystem Integrity	Investigate and implement alternative shoreline structures.
5.12.1 (VI)	NBVC NR In House		Promote experimentation and application of alternative LID and habitat-friendly landscaped areas adjacent to the shore.	1	SAIA, CZMA, EO 13101	Annual	2011 - 2030	6. Ecosystem Integrity	Implement LID approaches adjacent to the shoreline.
5.13			*Natural Resources Consultation Requirements*						
5.13.1			*Project or Mitigation Planning*						

Table 6-4. Integrated Natural Resources Management Plan Implementation Summary, including the assignment of priorities based on legal driver behind each project (Continued).

INRMP Management Strategy	Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level	Legal Driver	Implementation		Natural Resources Metrics Builder	Desired Future Condition
						Frequency	Year		
4.3.1 (VIII) 4.6.1 (XII) 5.13.1 (I, II, III, VI)	NBVC NR In House		Implement this INRMP by applying it as an initial screen for review of projects proposed on the installation from both Navy and outside interests to improve the success of mitigation and enhancement projects based on regulatory, functional, and ecosystem criteria.	1	SAIA, NEPA	Annual	2011 - 2030	1. INRMP Project Implementation	Develop and implement mitigation and enhancement projects.
5.13.1 (VII, VIII)	NBVC NR In House		Enforce Seasonal Avoidance Measures and Standard Mitigation Measures.	1	SAIA, NEPA, ESA	Annual	2011 - 2030	1. INRMP Project Implementation	Enforce measures.
5.14			*Landscaping and Grounds Maintenance*						
5.14 (I, II, IV, V, VI, VII, VIII, IX)	O&MN	63126EPR Landscape	Develop, implement, and revise as needed a Landscaping and Grounds Maintenance Plan and Instruction that outlines an appropriate landscaping and grounds maintenance program (e.g. that considers environmental factors and that adopts an Integrated Pest Management approach) to dealing with pest problems.	1	SAIA, EO 13148, EO 13112	Five Years	2015, 2020, 2025, 2030	6. Ecosystem Integrity	Develop and implement a Landscaping and Grounds Maintenance Plan.
5.16			*Outdoor Recreation*						
5.16 (I, II, III, IV)	NBVC NR In House		Develop, implement, and update as need an Outdoor Recreation Plan that identifies and evaluates suitable outdoor recreation opportunities for installation personnel in undeveloped areas and that continues to limit public access and outdoor recreation that are not consistent with the military mission at SNI.	1	SAIA, EO 12962	Five Years	2015, 2020, 2025, 2030	4. Fish and Wildlife Management and Public Use	Develop and implement an Outdoor Recreation Plan.
5.17			*Environmental Education*						
4.4.1 (II) 4.4.3 (XI) 4.5.1.1 (V) 4.5.1.2 (IV) 4.5.1.3 (III) 4.6.1 (II, IV) 5.17 (I, II, III, IV, V, VI, VII)	O&MN	63126EPR Education	Improve SNI community and environmental outreach through facilitating development of environmental education curriculum for researchers, personnel, and contractors. This will be accomplished by developing and distributing educational material, expanding education partnerships, by securing long-term funding to continue environmental education programs (e.g. brochures and videos), and evaluate the effectiveness of existing environmental education programs.	1	SAIA	Annual	2011 - 2030	4. Fish and Wildlife Management and Public Use 7. INRMP Impact on the Installation Mission	Maintain an environmental education program.
5.18			*Natural Resources Law Enforcement*						
5.18 (I, II)	NBVC NR In House		Provide information and education for the enforcement of natural resource laws and regulations by professionally trained personnel such as federal and state Conservation Officers.	1	SAIA	Annual	2011 - 2030	5. Team Adequacy 7. INRMP Impact on the Installation Mission	Enforce compliance with legal drivers.
6.0			*Implementation Strategy*						
6.1			*General Considerations*						
6.1.4			*Personnel Training*						

Table 6-4. Integrated Natural Resources Management Plan Implementation Summary, including the assignment of priorities based on legal driver behind each project (Continued).

INRMP Management Strategy	Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level	Legal Driver	Implementation		Natural Resources Metrics Builder	Desired Future Condition
						Frequency	Year		
6.1.4 (I, II)	NBVC NR In House		Maintain staff knowledge through training and participation in natural resource research and conservation programs and share information with natural resource experts.	1	SAIA	Annual	2011 - 2030	5. Team Adequacy	Maintain current knowledge in natural resource management.
6.2			*Adaptive Management*						
6.2.1			*Annual Update, Review, and Metrics*						
6.2.1 (I)	NBVC NR In House		Provide a notice of the intent to revise the INRMP to the USFWS and CDFG if a revision is found necessary.	1	SAIA	Annual	2011 - 2030	3. Partnership Effectiveness	Participate in collaborative planning efforts with relevant state and federal agencies.
6.2.1 (II, III, IV)	NBVC NR In House		Comply with recent CNI draft guidance on INRMPs and continue to utilize the INRMP Metrics Builder to assess implementation.	1	SAIA	Annual	2011 - 2030	1. INRMP Project Implementation	Utilize the INRMP Natural Resources Metrics Builder.
6.3			*Budget Considerations*						
6.3.2			*External Assistance*						
6.3.2.2			*Planned External Support*						
6.3.2.2 (I)	NBVC NR In House		Provide funding and support for research and other studies to further SNI natural resources management.	1	SAIA	Annual	2011 - 2030	1. INRMP Project Implementation	Conduct research and studies to further natural resources management.
6.4			*Funding Sources*						
6.4 (I)	NBVC NR In House		Provide documentation to secure appropriate levels of NBVC NR In House funding to support natural resource management programs.	1	SAIA	Annual	2011 - 2030	1. INRMP Project Implementation	Effective natural resource conservation and stewardship while supporting the military mission.
6.4 (II)	NBVC NR In House		Develop prioritized lists of proposed management efforts to guide development of funding proposals.	1	SAIA	Annual	2011 - 2030	1. INRMP Project Implementation	Effective natural resource conservation and stewardship while supporting the military mission.
6.4 (III, IV)	NBVC NR In House		Develop plans and documentation to secure external funding and continue to request external funding from other state and federal agencies.	1	SAIA	Annual	2011 - 2030	1. INRMP Project Implementation	Effective natural resource conservation and stewardship while supporting the military mission.
6.4 (V)	NBVC NR In House		Support scientific, academic, and volunteer efforts to initiate or supplement natural resources management programs.	1	SAIA	Annual	2011 - 2030	1. INRMP Project Implementation	Effective natural resource conservation and stewardship while supporting the military mission.
6.5			*INRMP Implementation Summary and Schedule*						
6.5 (I, II)	NBVC NR In House		Identify and ensure departments prioritize and allocate funding to support compliance requirements.	1	SAIA	Annual	2011 - 2030	1. INRMP Project Implementation	Effective natural resource conservation and stewardship while supporting the military mission.
6.5 (III)	NBVC NR In House		Seek awards for natural resource work conducted at SNI.	1	SAIA	Annual	2011 - 2030	1. INRMP Project Implementation	Effective natural resource conservation and stewardship while supporting the military mission.
6.5 (IV)	NBVC NR In House		Continue to ensure effective communication, adaptive oversight, and policy leadership through the USDON Natural Resources Strategic Plan.	1	SAIA	Annual	2011 - 2030	1. INRMP Project Implementation	Effective natural resource conservation and stewardship while supporting the military mission.

6.6 Implementation Funding

Table 6-5 summarizes the supporting INRMP management strategies discussed in Chapters 4-6, the EPR funding code, project name, and potential funding source for implementing all natural resources projects identified in this INRMP. The SAIA requires implementation of this INRMP; however, INRMP implementation is also subject to the provisions of the Federal Antideficiency Act. Some INRMP projects are accomplished with installation staff; others involve contracting work to specialists. The implementation schedule identified in Table 6-4 INRMP Implementation Summary is suggested for long-term planning purposes; however, the schedule may be modified based on need, resources, and seasonal requirements.

Table 6-5. Natural Resource Projects Funding Summary .

INRMP Management Strategy	EPR Project Code	Project Name	Potential Funding Sources
4.1 (VI)	69232B0094	INRMP revisions and associated EA to incorporate current resources and management knowledge.	O&MN
4.2.2 (I, II, III, V) 4.3.1 (VI) 4.3.1.1 (IV) 4.5.2.1 (IV)	63126EPRErosion	Develop and implement an erosion control plan.	O&MN
4.2.3 (I, II, III, IV, V) 4.3.1.4 (I)	63126EPRFire	Develop and implement a WFMP for SNI.	O&MN
4.2.2 (IV, VI, VII, VIII) 4.3.1 (I, V, VII, IX, X) 4.3.1.1 (I, II, III, V) 4.3.1.3 (I) 4.3.1.5 (I)	63126XXX89	Inventory plant species diversity, abundance, and density to develop priorities for monitoring that establishes ranking system, sensitive species habitat, and creates criteria for restoration work while defining the extent, nature, and value of vegetation resources of SNI.	O&MN
4.3.1.6 (II, III)	63126EPRDune	Develop and implement a dune drift management plan to determine effective alternatives to manage dune drift impact to roads, operations, and natural resources.	O&MN
4.3.2 (I)	63126XXX87	Maintain a current inventory of wetlands to support planning and management efforts to achieve no net loss of wetlands.	O&MN
4.3.3.1 (I)	63126EPRMarine	Collect baseline information and establish monitoring protocols for sandy beach communities to support management to maintain habitat integrity.	O&MN
4.3.3.2 (I, II)	63126EPRMarine	Continue rocky intertidal surveys and encourage additional monitoring at SNI consistent with monitoring performed at the other Channel Islands and throughout California, to establish regional trends and understand site specific change.	O&MN
4.3.3.3 (I) 4.3.3.4 (I)	63126EPRMarine	Develop and implement unvegetated and vegetated soft bottom monitoring protocols at SNI to determine resource status and extent of submerged aquatic vegetation.	O&MN
4.3.3.5 (I)	63126EPRMarine	Support establishment of kelp forest ecosystem monitoring locations around SNI while encouraging state and federal agencies and academic researchers to investigate important community related questions involving recruitment, disturbance, and species diversity that help to assess regional trends.	O&MN
4.4.1 (I)	63126XXX97	Collect baseline information on the terrestrial invertebrate community of SNI, with particular emphasis on endemics and pollinators.	O&MN
4.4.2 (I, II, III)	63126XXX85	Conduct regular monitoring of reptiles and amphibians in addition to island night lizard monitoring and develop accurate GIS data layers for known populations and conserve habitat associations to avoid sensitive areas and minimize potential impacts.	O&MN
4.4.3 (I, II, V, VI, VII, VIII, X)	63126EPRBird	Migratory and resident bird inventory and restoration management activities to conserve bird population and develop and maintain information on status and trend of population and habitats.	O&MN
4.4.3 (IX)	63126XXX86	Monitor resident seabird populations and breeding colonies to track the sustainability of populations and their habitat.	O&MN
4.4.4 (III)	63126B0067	Inventory and monitor bat populations on SNI to adapt management strategies based on current population status.	O&MN

Table 6-5. Natural Resource Projects Funding Summary (Continued).

INRMP Management Strategy	EPR Project Code	Project Name	Potential Funding Sources
4.4.5 (I, II)	63126EPRMarine	Collect community level marine macroalgae baseline information surveys to support focused management efforts and identify indicator species. Survey subtidal and intertidal areas near high use locations (pier and barge landing areas) for the introduction of non-native invasive species.	O&MN
4.4.6 (I)	63126EPRMarine	Develop and implement a marine resource stewardship plan.	O&MN
4.4.7 (I)	63126EPRMarine	Develop a fish monitoring program and management plan to conserve fish population abundance and habitat diversity.	O&MN
4.4.8 (I, II, III)	63126XXX88	Monitor island wide pinniped breeding and haul out sites and periodic evaluation of current adaptive management practices.	O&MN
4.5.1 (I, III)	63126B003	Ensure that land use plans and activities in or near threatened or endangered species habitats are accomplished in accordance with the ESA in accordance with current Biological Opinions and with ESA Section 7 Consultation Handbook (USFWS/NMFS 1998).	O&MN
4.5.1 (II)	63126B003	Per USFWS Biological Opinion (2001) provide the USFWS an annual report containing the number of island night lizards, California brown pelicans, and western snowy plover killed or injured by Navy activities, and a summary of Navy activities and their effects on listed species, in accordance with the reporting requirements in the BO (USFWS 2001).	O&MN
4.5.1.1 (I, II, III, IV, VI)	63126XXX85	Support recovery plan efforts to establish stable island night lizard populations and eventual delisting by conducting site specific surveys prior to disturbance activities, implementing avoidance and minimization measures, and conducting studies to investigate the effectiveness of island night lizard management strategies with respect to impacts from alligator lizards and the relocation of island night lizards.	O&MN
4.5.1.2 (I)	63126B003	Support recovery plan efforts to establish stable western snowy plover populations and eventual delisting by closing nesting areas to recreational activity during the March 1 - September 15 breeding season and by removing unnecessary structures in nesting areas.	Navy Tenant Funded
4.3.3 (II) 4.5.1.2 (II, III, VI)	63126B003	Support recovery plan efforts to establish stable western snowy plover populations and eventual delisting by monitoring the effects of Navy activities on snowy plovers through conducting island wide snowy plover censuses twice annually, once during the breedings season and once during the winter season, and through monitoring snowy plover nests during missile or target launches, general operations, and other activities that may disturb nesting behaviors.	Navy Tentant Funded
4.3.3 (I) 4.5.1.3 (I, II, VII)	63126EPRBlackAb	Support recovery plan efforts to establish stable black abalone populations through continuing to conduct presence and absence surveys and through developing and implementing annual abalone monitoring protocols.	O&MN
4.5.1.3 (IV, V)	63126EPRBlackAb	Continue to support appropriate closures at SNI and continue to review all military activities to ensure that they are in compliance with ESA and to avoid or minimize impacts to black abalone.	O&MN
4.5.1.4 (I, II, III)	63126EPRMarine	Support recovery plan efforts to establish stable white abalone populations by facilitating efforts to identify white abalone habitat and determine densities of individuals around SNI.	O&MN
4.5.2.1 (I, II, III, V)	63126EPRRarePlant	Collect data on the habitat and reproductive requirements for sensitive endemic plants species for conservation and management efforts.	O&MN
4.5.2.2 (I)	63126XXX97	Collect baseline information on the special status native invertebrate species of SNI.	O&MN
4.5.2.3 (I, II)	63126EPRBird	Provide for the recovery, enhancement, and protection of Xantus's murrelets, as a proactive strategy to prevent federal listings and continue to resolve baseline biological data gaps.	O&MN
4.5.2.4 (I, II)	63126EPRBird	Provide for the recovery, enhancement, and protection of Ashy storm petrels, as a proactive strategy to prevent federal listings and continue to resolve baseline biological data gaps.	O&MN
4.5.2.5 (I, II)	63126XXX93	Maintain a viable population of the San Nicolas Island fox by reducing negative, human caused impacts and remaining an active participant with other agencies regarding Island fox issues.	Navy Tenant Funded
4.5.2.7 (I, II)	63126EPRMarine	Support on-going and new research on distribution and ecology of the Southern sea otter at SNI. Encourage academic institutions to facilitate resource data collection and record all sightings of Southern sea otters at SNI and develop a database to track numbers of individuals, time of year, and location.	O&MN

Table 6-5. Natural Resource Projects Funding Summary (Continued).

INRMP Management Strategy	EPR Project Code	Project Name	Potential Funding Sources
4.3.1 (II, III) 4.3.1.2 (I) 4.3.1.3 (II) 4.3.1.4 (II) 4.3.1.6 (I) 4.5.2.1 (VI) 4.6.1 (V, VI, VII, XIV)	69232XXX90	Update and implement the invasive non-native plant species management and eradication program to insure use of existing BMPs to reduce the introduction of invasive species, establish early detection and rapid response protocol, map and prioritize most problematic terrestrial invasive nonnative species populations, and maintain consistency with long-term protection of native plant communities.	O&MN
4.4.1 (III) 4.6.1 (I, III, VIII, IX, XIII, XVI) 4.7.2 (IV)	6923224086	Develop and implement a biosecurity plan to ensure invasive terrestrial fauna and flora are not brought to SNI by providing prevention, early detection, rapid response, and education guidelines.	O&MN
4.6.1 (XV)	6923224086	Assess and monitor the progress and success of the removal of feral cats to support the shorebird enhancement project.	O&MN
4.6.2 (I, II, III) 4.4.5 (III)	63126 EPR Marine Invasives	Develop and implement a plan to prevent the introduction of invasive nonnative marine and coastal species into SNI waters which includes a standardized monitoring system focused on early detection for high priority aquatic invasive species, and rapid response protocol when an invasive is detected.	O&MN
4.1 (IV) 5.1.2 (I, II, III, IV, V, VI, VII)	63126EPR Climate Change	Control and reduce greenhouse gas emissions by improving governance, implementing the SNI Net Zero Energy Installation Plan, providing energy conservation education, and addressing impacts in NEPA documents.	O&MN
4.6.1 (XI) 5.2.1 (I, II, IV, V)	63126EPRRoad	Develop and implement an Island Road Long-term Maintenance Plan that updates and improves road maintenance best management practices, applies the principles of "Integrated Vegetation Management," and adopts mowing instructions to meet multiple objectives for roadside maintenance to alleviate harmful environmental impacts and enhance possible benefits. Adopt a Mowing Instruction that provides roadside fire safety and minimizes detrimental environmental effects. Comply with CWA Section 404 Permit and Section 401 State Water Quality Certification.	O&MN
5.14 (I, II, IV, V, VI, VII, VIII, IX)	63126 EPR Landscape	Develop, implement, and revise as needed a Landscaping and Grounds Maintenance Plan and Instruction that outlines an appropriate landscaping and grounds maintenance program (e.g. that considers environmental factors and that adopts an Integrated Pest Management approach) to dealing with pest problems.	O&MN
4.4.1 (II) 4.4.3 (XI) 4.5.1.1 (V) 4.5.1.2 (IV) 4.5.1.3 (III) 4.6.1 (II, IV) 5.17 (I, II, III, IV, V, VI, VII)	63126 EPR Education	Improve SNI community and environmental outreach through facilitating development of environmental education curriculum for researchers, personnel, and contractors. This will be accomplished by developing and distributing educational material, expanding education partnerships, by securing long-term funding to continue environmental education programs (e.g. brochures and videos), and evaluate the effectiveness of existing environmental education programs.	O&MN

7.0 References

7.1 Chapter 1

Bunn, D., A. Mummert, M. Hoshovsky, K. Gilardi, and S. Shanks. 2007. California Wildlife: Conservation Challenges, California's Wildlife Action Plan. Prepared by the U.C. Davis Wildlife Health Center for the California Department of Fish and Game, Sacramento, CA.

Bureau of Land Management (BLM). 2005. California Coastal National Monument Resource Management Plan. U.S. Department of the Interior, Bureau of Land Management, California State Office, September 2005.

California Department of Fish and Game (CDFG). 2008a. California Marine Life Protection Act: Master Plan for Marine Protected Areas. Prepared by the California Resources Agency, Department of Fish and Game, January 2008.

California Department of Fish and Game (CDFG). 2008b.California Aquatic Invasive Species Management Plan.

California Department of Fish and Game (CDFG). 2005. Final Abalone Recovery and Management Plan. Prepared by the California Resources Agency, Department of Fish and Game, Marine Region, 09 December 2005.

California Department of Fish and Game (CDFG). 2002. Nearshore Fishery Management Plan. Prepared by the California Resources Agency, Department of Fish and Game, Marine Region, August 2002.

California Resources Agency (CRA) and California Environmental Protection Agency (CalEPA). 2004. Protecting Our Ocean: California's Action Strategy.

Channel Island National Park (CINP). 2010. <http://www.nps.gov/chis/parkmgmt/partners.htm>. Accessed 30 July 2010.

De Violini, R. 1974. Climate handbook for Point Mugu and San Nicolas Island, Part I, surface data. Technical Publications PMR-TP-74-1, Pacific Missile Range, Point Mugu, CA. 139 pp.

National Oceanic and Atmospheric Administration (NOAA). 2009. Channel Islands National Marine Sanctuary Management Plan.

National Park Service (NPS). 2003. Channel Islands National Park Recovery Strategy for Island Foxes on the Northern Channel Islands.

National Park Service (NPS). 1985. Channel Islands National Park General Management Plan.

National Renewable Energy Laboratory (NREL). 2008. San Nicolas Island, California Renewable Community Plan Outline, Baseline Development, and Initial Renewable Assessment.

Naval Air Warfare Center Aircraft Division / Weapons Division (NAWCAD/WD). 2008. Naval Air Warfare Center Aircraft Division / Weapons Division Strategic Plan: Charting Our Course.

Naval Air Warfare Center Weapons Division (NAWCWD). 2002. Final Environmental Impact Statement/Overseas Environmental Impact Statement for Point Mugu Sea Range. Prepared by U.S. Department of the Navy, Naval Air Systems Command, Naval Air Warfare Center Weapons Division, Point Mugu, CA.

Naval Base Ventural County (NBVC) San Nicolas Island (SNI). 2010. Storm Water Pollution Prevention Plan. Prepared by Jonas and Associates under Contract Number N62473-08-D-8811 and Contract Task Order No. 0003.

Naval Facilities Engineering Command Southwest (NAVFACSW). 2010a. NBVC San Nicolas Island and Fort Hunter Liggett: Activity Overview Plan. Prepared by KTU+A under Naval Facilities Engineering Command Southwest Contract # N62473-08-D-8623 Delivery Order 09.

Naval Outlying Landing Field (NOLF) San Nicolas Island (SNI). 2006a. Naval Outlying Landing Field (NOLF) San Nicolas Island (SNI) Emergency Response Action Plan - The Red Plan.

Naval Outlying Landing Field (NOLF) San Nicolas Island (SNI). 2006b. Naval Outling Landing Field (NOLF) San Nicolas Island (SNI) Oil and Hazardous Substances Pollution Contingency Plan.

Naval Outlying Landing Field (NOLF) San Nicolas Island (SNI). 2003. Master Plan: Nicktown and Public Works Areas.

Regional Water Quality Control Board (RWQCB). 1994. Water Quality Control Plan, Los Angeles Region, Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties.

State Water Resources Control Board (SWRCB). 2003. State Water Resources Control Board Marine State Water Quality Protection Areas - Areas of Special Biological Significance.

State Water Resources Control Board (SWRCB). 2001. Water Quality Control Plan for Ocean Waters of California: California Ocean Plan. California Environmental Protection Agency, State Water Resources Control Board.

State Water Resources Control Board (SWRCB). 1976. Areas of Special Biological Significance. California Environmental Protection Agency, State Water Resources Control Board.

U.S. Department Defense (USDOD). 2006. Department of Defense Office of the Under Secretary of Defense Memorandum for Deputy Assistant Secretary of the Army (Environment, Safety, and Occupational Health), Deputy Assistant Secretary of the Navy (Environment), Deputy Assistant Secretary of the Air Force (Environment, Safety, and Occupational Health) and Director Defense Logistics Agency Regarding Integrated Natural Resources Management Plant (INRMP) Template, 14 August 2006.

U.S. Department of the Navy (USDON). 2007a. Naval Operations Instruction Number 5090.1C (OPNAVINST 5090.1C) Environmental and Natural Resources Program Manual, 30 October 2007.

U.S. Department of the Navy (USDON). 2006a. Department of the Navy Office of the Chief of Naval Operations Integrated Natural Resources Management Plant Guidance for Navy Installations: How to Prepare, Implement, and Revise Integrated Natural Resource Management Plans (5090 N456K/6U838101 10 April 2006), April 2006.

U.S. Department of the Navy (USDON). 2005a. Naval Base Ventura County (NBVC) Comprehensive Land Use Management Plan.

U.S. Department of the Navy (USDON). 2005b. Integrated Natural Resources Management Plan for San Nicolas Island, California, 2006-2010. 135 pp.

U.S. Department of the Navy (USDON). 2002. Naval Base Coronado San Clemente Island Integrated Natural Resource Management Plan (INRMP).

U.S. Department of the Navy Pacific Fleet (USDONPF). 2008. United States Navy Pacific Fleet Southern California Range Complex Environmental Impact Statement /Overseas Environmental Impact Statement.

U.S. Fish and Wildlife Service (USFWS). 2009. Draft Post-Delisting Monitoring Plan for the Brown Pelican (*Pelecanus occidentalis*). U.S. Fish and Wildlife Service, Ventura Fish and Wildlife Office, Ventura, California. 19 pp.

U.S. Fish and Wildlife Service. 2007. Recovery Plan for the Pacific Coast Population of the Western Snowy Plover (*Charadrius alexandrinus nivosus*). In 2 volumes. Sacramento, California. xiv + 751 pages.

U.S. Fish and Wildlife Service (USFWS). 2005. Regional Seabird Conservation Plan Pacific Region.

U.S. Fish and Wildlife Service (USFWS). 2004. North American Waterfowl Management Plan.

U.S. Fish and Wildlife Service (USFWS). 2003. Final Revised Recovery Plan for the Southern Sea Otter (*Enhydra lutris nereis*). Portland, Oregon. xi + 165 pp.

U.S. Fish and Wildlife Service (USFWS). 2002. North American Waterbird Conservation Plan.

U.S. Fish and Wildlife Service (USFWS). 2001. United States Shorebird Conservation Plan.

U.S. Fish and Wildlife Service (USFWS). 1984. Recovery Plan for the Endangered and Threatened Species of the California Channel Islands. U.S. Fish and Wildlife Service, Portland Oregon. 165 pp.

7.2 Chapter 2

Bleitz, D.E. 1993. "The Prehistoric Exploitation of Marine Mammals and Birds at San Nicolas Island, California." Pp. 519-536 In: *The Third California Islands Symposium: Recent Advances in Research on the California Islands*, F.G. Hochberg (Ed). Santa Barbara, CA: Santa Barbara Museum of Natural History.

Bunn, D., A. Mummert, M. Hoshovsky, K. Gilardi, and S. Shanks. 2007. California Wildlife: Conservation Challenges, California's Wildlife Action Plan. Prepared by the U.C. Davis Wildlife Health Center for the California Department of Fish and Game, Sacramento, CA.

California Mission Resource Center (CMRC). 2010. http://www.missionscalifornia.com/stories/lone-woman-san-nicolas-island.html. Accessed 2 August 2010.

Dotson and Charter. 2003. Trends in the Southern California Sport Fishery. CalCOFI Rep., Vol 44 94-106 pp.

Ellison, W.H. (editor). 1937. The life and adventures of George Nidever [1802-1883]: the life story of a remarkable California pioneer told in his own words, and none wasted. University of California Press, Berkeley.

Halvorson, W.L., S. Junak, C. Schwemm, and T. Keeney. 1996. Plant communities of San Nicolas Island, California. Technical Report 55. National Biological Service, Cooperative Park Studies Unit, University of Arizona, Tucson, AZ.

Halvorson, W.L. and G.J. Maender, G. J. (Eds.). 1994. The Fourth California Islands Symposium: Update on the Status of Resources. Santa Barbara, CA: Santa Barbara Museum of Natural History.

Hochberg, F. G. (Ed). 1993. The Third California Islands Symposium: Recent Advances in Research on the California Islands. Santa Barbara, CA: Santa Barbara Museum of Natural History.

Junak, S. 2008. A Flora of San Nicolas Island, California. Santa Barbara, CA: Santa Barbara Botanic Garden. 235 pp.

Junak, S. and J. Vanderweir. 1990. "An Annotated Checklist of the Vascular Plants of San Nicolas Island, California." Pp. 121-145 In: *Proceedings of the Fifth Biennial Mugu lagoon/ San Nicolas Island Ecological Research Symposium*. Naval Air Station, Point Mugu, CA.

Merkel and Associates Inc. 2007a. Naval Base Ventura Country San Nicolas Island: Area of Special Biological Significance, Historical Assessment of Brine Waste Effluent and Storm Water and Compliance History. Prepared for NAVFAC Southwest.

National Marine Fisheries Service—Northwest Region. 2004. Pacific Groundfish Fishery Management Plan Essential Fish Habitat Preliminary Draft Environmental Impact Statement. Seattle Washington.

National Oceanic and Atmospheric Administration (NOAA) Fisheries. 2010. Marine Mammal Protection Act (MMPA) of 1972. http://www.nmfs.noaa.gov/pr/laws/mmpa/. Accessed 30 March 2010.

National Renewable Energy Laboratory (NREL). 2008. San Nicolas Island, California Renewable Community Plan Outline, Baseline Development, and Initial Renewable Assessment.

Naval Air Warfare Center Weapons Division (NAWCWD). 2002. Final Environmental Impact Statement/Overseas Environmental Impact Statement for Point Mugu Sea Range. Prepared by U.S. Department of the Navy, Naval Air Systems Command, Naval Air Warfare Center Weapons Division, Point Mugu, CA.

Naval Air Weapons Station China Lake (NAWSCL). 2002. Environmental Assessment for Construction of Supply Pier at San Nicolas Island.

Naval Base Ventura County (NBVC) San Nicolas Island (SNI). 2010. Storm Water Pollution Prevention Plan. Prepared by Jonas and Associates under Contract Number N62473-08-D-8811 and Contract Task Order No. 0003.

Naval Facilities Engineering Command Southwest (NAVFACSW). 2010a. NBVC San Nicolas Island and Fort Hunter Liggett: Activity Overview Plan. Prepared by KTU+A under Naval Facilities Engineering Command Southwest Conract # N62473-08-D-8623 Delivery Order 09.

Naval Facilities Engineering Command Southwest (NAVFACSW). 2010b. Preliminary Final Environmental Assessment for the Development of Wind Energy Facilities on San Nicolas Island, Ventura County, California. Prepared for U.S. Department of the Navy, Naval Facilities Engineering Command Southwest, 1220 Pacific Highway, San Diego, California 92132-5190. Contract Number N62473-09-D-2602, Delivery Order 0003.

Naval Outlying Landing Field (NOLF) San Nicolas Island (SNI). 2006a. Naval Outlying Landing Field (NOLF) San Nicolas Island (SNI) Emergency Response Action Plan - The Red Plan.

Naval Outlying Landing Field (NOLF) San Nicolas Island (SNI). 2006b. Naval Outling Landing Field (NOLF) San Nicolas Island (SNI) Oil and Hazardous Substance Integrated Contingency Plan.

Naval Outlying Landing Field (NOLF) San Nicolas Island. 2003. Master Plan: Nicktown and Public Works Areas. Prepared by the Onyx Group.

National Renewable Energy Laboratory (NREL). 2008. San Nicolas Island, California Renewable Community Plan Outline, Baseline Development, and Initial Renewable Assessment.

O'Malley, P.G. 1994. "Animal Husbandry on the Three Southernmost Channel Islands: A Preliminary Overview, 1820-1950." Pp. 157-164 In: *The Fourth California Islands Symposium: Update on the Status of Resources*, W.L. Halvorson and G.J. Maender (Eds). Santa Barbara, CA: Santa Barbara Museum of Natural History.

Philbrick, R.N. (Ed). 1967. Proceedings of the symposium on the biology of the California Islands. Santa Barbara, CA: Santa Barbara Museum of Natural History.

Power, D.M. (Ed). 1980. The California Islands: Proceedings of a Multidisciplinary Symposium. Santa Barbara, CA: Santa Barbara Museum of Natural History.

Schwartz, S.J. 1994. "Ecological Ramifications of Historic Occupation of San Nicolas Island." Pp. 171-180 In: *The Fourth California Islands Symposium: Update on the Status of Resources*, W.L. Halvorson and G.J. Maender (Eds.). Santa Barbara, CA: Santa Barbara Museum of Natural History.

State Water Resources Control Board (SWRCB). 2003. Areas of Special Biological Significance: California's Marine State Water Quality Protection Areas. California Environmental Protection Agency, State Water Resources Control Board.

State Water Resources Control Board (SWRCB) and California Regional Water Quality Control Boards (RWQCB). 1970. SWRCB and California RWQCB's Administrative Procedures, September 24, 1970, Section XI, Miscellaneous (Rev. 7-9/1/1972), Designation of Areas of Special Biological Significance.

Trask, B. 1900. Dying San Nicolas. Land of Sunshine 13(2):97-100

U.S. Department of Defense (USDOD). 1996. Department of Defense Instruction Number 4715.3, Environmental Conservation Program. 03 May 1996.

U.S. Department of the Navy (USDON). 2005. Integrated Natural Resources Management Plan for San Nicolas Island, California, 2006-2010. 135 pp.

U.S. Department of the Navy (USDON). 2005b. Environmental Assessment for the Development of an Integrated Natural Resources Management Plan at San Nicolas Island, California.

U.S. Environmental Protection Agency (USEPA). 2010d. Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). http://www.epa.gov/superfund/policy/cercla.html. Accessed 23 March 2010.

7.3 Chapter 3

Agri Chemical and Supply, Inc. 2009. Invasive Plant Control on OLF San Nicolas Island- 2008 Report. Prepared for Natural Resources Office, Commander Navy Region Southwest, Under Contract with Southwest Division, Naval Facilities Engineering Command, Contract # N^8711-04-D-3604, Task Order 0059.

Ainley D.G., Sydeman, W.J., and Norton, J. 1995. Upper trophic level predators indicate interannual negative and positive anomalies in the California Current food web. Marine Ecology Progress Series 118: 69-79.

Ainley, D.G, and R.J. Boekelheide. 1990. Seabirds of the Farallon Islands: ecology, dynamics, and structure of an upwelling system community. Stanford University Press, Stanford, CA. 450 pp.

Anderson, T.W. 1994. Role of macroalgal structure in the distribution and abundance of a temperate reef fish. Marine Ecological Progress Series 113: 279-290.

Anderson, D.W. and Gress F. 1983. Status of the northern population of California brown pelicans. Condor 85: 79-88.

Anderson, D.W., Gress F., Mais, M.F. 1982. Brown pelicans: influence of food supply on reproduction. Oikos 39:23-31.

Anderson, D.W., Jehl, J.R., Risebrough R.W., Woods, L.A., DeWeese, L.R., and Edgecomb, W.G. 1975. Brown pelicans: improved reproduction off the southern California coast. Science 190: 806-808.

Andres, B. A., and G. A. Falxa. 1995. Black Oystercatcher (*Haematopus bachmani*). In The Birds of North America, No. 155. A. Poole and F. Gill (Eds.). The Birds of North America, Inc., Philadelphia, PA.

Azevedo, J. and Morgan D.L. 1974. Fog precipitation in coastal California forests. Ecology, 55, 1135-1141.

Barlow, J., Forney, K.A., Hill, P.S., Brownell Jr., P.S., Carretta, J.V., DeMaster, D.P., Julian, F., Lowry, M.S., Ragen, T., and Reeves R.R. 1997. U.S. Pacific Marine Mammal Stock Assessments: 1996. NOAA Technical Memorandum NMFS-SWFSC-248. Southwest Fisheries Science Center, National Marine Fisheries Service, La Jolla, CA.

Barlow, J., Boveng, P., Lowry, M.S., Stewart, B.S., Le Boeuf, B.J., Sydeman, W.J., Jameson, R.J., Allen, S.G., and C.W. Oliver. 1993. Status of the northern elephant seal population along the U.S. west coast in 1992. Administrative Report LJ_93_01. Southwest Fisheries Science Center, National Marine Fisheries Service, La Jolla, CA. 32 pp.

Barnard, J.L. 1963. Relationship of benthic Amphipoda to invertebrate communities of inshore sublittoral sands of southern California. Pacific Nature 3:439-467.

Barnes RSK, Hughes RN. 1988. An introduction to marine ecology. 2nd ed. Oxford: Blackwell, pp 351 p.

Bezy, R.L., G.C. Gorman, G.A. Adest, and Y.J. Kim. 1980. Divergence in the island night lizard *Xantusia riversiana* (*Sauria: Xantusiidae*). Pp. 565-583. In: D.M. Power (Ed.), The California Islands: Proceedings of a Multidisciplinary Symposium. Santa Barbara Museum of Natural History, Santa Barbara, California.

Blecha, J.B., Steinbeck, J.R., and D.C. Sommerville. 1992. Aspects of the biology of the black abalone (*Haliotis cracherodii*) near Diablo Canyon, central California. Pages 225-236 in S.A. Shepherd, M.J. Tegner, and S.A. Guzman del Proo (Eds.). Abalone of the world: Biology, fisheries, and culture. Proceedings of the 1st International Symposium on Abalone. Blackwell Scientific Publications Ltd., Oxford, U.K.

Bodkin, J.L. 1988. Effects of kelp removal on associated fish assemblages in central California. Journal of Experimental Marine Biology and Ecology 1 (17): 227-238.

Bonnell, M.L. and M.D. Dailey. 1993. Marine mammals. In M.D. Dailey, D.J. Reish, and J.W. Anderson, editors. Ecology of the Southern California Bight: A synthesis and interpretation. Berkeley: University of California Press. pp. 604-681.

Bonnell, M.L., and R.G. Ford. 1987. California sea lion distribution: A statistical analysis of aerial transect data. Journal of Wildlife Management 51(1): 13-20.

Bretagnolle, V. 1990. Effect of moon on activity of petrels (Class Aves) from the Selvagen Islands (Portugal). Canadian Journal of Zoology 68: 1404-1409.

Brown, S., Hickey, C., Harrington, B., and R. Gill (Eds.). 2001. The U.S. Shorebird Conservation Plan, 2nd edition. Manomet Center for Conservation Sciences, Manomet, MA.

Browne, D.R. 1994. Understanding the oceanic circulation in and around the Santa Barbara Channel. The Fourth California Islands Symposium: update on the status of resources (ed. by W.L. Halvorson and G.J. Maender), pp. 27-34. Santa Barbara Museum of Natural History, Santa Barbara.

Bunn, D., Mummert, A., Hoshovsky, M., Gilardi, K., and S. Shanks. 2007. California Wildlife: Conservation Challenges, California Wildlife Action Plan. Prepared by the UC Davis Wildlife Health Center for the California Department of Fish and Game.

Bureau of Land Management (BLM). 2005. California Coastal National Monument Resource Management Plan.

Burgess, S.S.O., and Dawson, T.E. 2004. The contribution of fog to the water relations of *Sequoia sempervirens* (D. Don): foliar uptake and prevention of dehydration. Plant Cell and Environment, 27, 1023-1034.

Burnham, W., F. Kunkel, W. Hofmann, and W. Peterson. 1963. Hydrogeologic reconnaissance of San Nicolas Island, California. U.S. Geological Survey Water Supply Paper 1539-O. U.S. Government Printing Office, Washington, D.C. 43 pp.

Butler, J., Neuman, M., Pinkard, D., Kvitek, R., and G. Cochrane. 2006. The use of multibeam sonar mapping techniques to refine population estimates of the endangered white abalone (*Haliotis sorenseni*). Fishery Bulletin 104: 521-532.

California Department of Fish and Game (CDFG). 2010. State and Federally Listed Endangered and Threatened Animals of California.

California Department of Fish and Game (CDFG). 2008. California Bird Species of Special Concern.

California Department of Fish and Game (CDFG). 2006. News Release. http://www.dfg.ca.gov/OSPR/organizational/admin/news/2006news/brownpelicans-nr-060606.pdf.

California Department of Fish and Game (CDFG). 2005. Final Abalone Recovery and Management Plan. Prepared by the California Resources Agency, Department of Fish and Game, Marine Region, 09 December 2005.

California Department of Fish and Game (CDFG). 1974. Cruise Report 74-KB-15 and 74-M-3 Abalone-Lobster Investigations. Prepared by R. Burge for the State of California - The Resources Agency, Department of Fish and Game, Marine Resources Region, Long Beach, California.

California Natural Diversity Database (CNDDB). 2009. California Natural Diversity. <http://www.dfg.ca.gov/biogeodata/cnddb>.

Capitolo, P.J., Davis, J.N., Henkel, L.A., Tyler, W.B., Carter, H.R., and Kelly P.R. 2007. Monitoring cormorant populations in Southern California in 2005-2006: Asilomar, California, Pacific Seabird Group Annual Meeting, Abstracts: 53-54 (www.pacificseabirdgroup.org).

Caplan, R.I. and R.A. Bootllootian. 1967. Intertidal Ecology of San Nicolas Island. Proceedings of the Symposium on the Biology of the California Islands. Santa Barbara, California.

Carr, M.H. 1994. Effects of macroalgal dynamics on recruitment of a temperate reef fish. Ecology 75:1320?1333.

Carr, M.H. 1991. Habitat selection and recruitment of an assemblage of temperate zone reef fishes. Journal of Experimental Marine Biology and Ecology 146: 113-137.

Carretta, J.V., Forney, K.A., Lowry, M.S., Barlow, J., Baker, J., Johnston, D., Hanson, B., Muto, M.M., Lynch, D., and L. Carswell. 2009. U.S. Pacific Marine Mammal Stock Assessments: 2008. U.S. Department of Commerce, NOAA Technical Memorandum: NOAA-TM-NMFS-SWFSC-434.

Carretta, J.V., Forney, K.A., Lowry, M.S., Barlow, J., Baker, J., Hanson, B., and M.M. Muto. 2007. U.S. Pacific Marine Mammal Stock Assessments: 2007. U.S. Department of Commerce, NOAA Technical Memorandum, NMFS-SWFSC-414. 320 pp.

Carretta, J.V., Lowry, M.S., Stinchcomb, C.E., Lynn, M.S., and Cosgrove, R.E. 2000. Distribution and abundance of marine mammals at San Clemente Island and surrounding offshore waters: Results from aerial and ground surveys in 1998 and 1999. Southwest Fisheries Science Center Administrative Report LJ-00-02. La Jolla, California: National Marine Fisheries Service.

Carter, H.R., McChessney, G.J., Jaques D.L., Strong, C.S., Parker, M.W., Takekawa, J.E., Jory, D.L., and Whitworth, D.L. 1992. Breeding Populations of Seabirds in California, 1989-1991. Vol. 1 - Population Estimates, Unpublished Final Report, U.S. Fish and Wildlife Service, Northern Prairie Wildlife Research Center, Dixon, California.

Channel Islands National Park (CINP). 2005. Seabird Monitoring Annual Report, National Park Service, Department of the Interior, Washington, D.C.

Clifford, D.L., Mazet, J.A.K., Dubovi, E.J., Garcelon, D.K., Coonan, T.J., Conrad, P.A., and L. Munson. 2006. Pathogen exposure in endangered island fox (*Urocyon littoralis*) populations: Implications for conservation management. Biological Conservation 131: 230-243.

Cole, E.S. 2005. Root and whole plant growth responses to soil resource heterogeneity in coastal dune shrubs of California. PhD Dissertation, Department of Ecology, Evolution, and Marine Biology, University of California, Santa Barbara.

Collins, P.W. 1991a. Interaction between Island foxes (*Urocyon littoralis*) and Indians on islands off the coast of southern California: I. Morphological and archaeological evidence of human assisted dispersal. Journal of Ethnobiology 11(1):51-81.

Collins, P.W. 1991b. Interaction between Island foxes (*Urocyon littoralis*) and Native Americans on islands off the coast of southern California: II. Ethnographic, archaeological, and historical evidence of human assisted dispersal. Journal of Ethnobiology 11(2):205-229.

Corbin, J.D., Thomsen, M.A., Dawson, T.E., and D'Antonio, C.M. 2005. Summer water use by California coastal prairie grasses: fog, drought, and community composition. Oecologia, 145, 511-521.

Cross, J.N., and Allen L.G. 1993. Fishes. In M.D. Dailey, D.J. Reish, and J.W. Anderson (Eds.). Ecology of the Southern California Bight, A Synthesis and Interpretation. University of California Press, Berkeley, CA. pp. 459-540.

Dailey, M.D., D.J. Reish, and J.W. Anderson (Eds.). 1993. Ecology of the Southern California Bight: A Synthesis and Interpretation. University of California Press, Berkeley/Los Angeles.

Dawson, T.E. 1998. Fog in the California Redwood forest: ecosystem inputs and use by plants. Oecologia, 117, 476-485.

Dayton PK. 1985. Ecology of kelp communities. Annu Rev Ecol Syst 16:215-45.

DeMartini, E.E. and D.A. Roberts. 1990. Effects of giant kelp (*Macrocystis*) on the density and abundance of fishes in a cobble-bottom kelp forest. Bulletin of Marine Science 46: 287-300.

De Violini. R. 1974 Climatic handbook for Point Mugu and San Nicolas Island, Part I, surface data. Technical Publication PMR-TP-74-1. Pacific Missile Range, Point Mugu, California. 139 pp.

Deysher, L.E., Dean, T.A., Grove, R.S., Jahn, A. 2002. Design considerations for an artificial reef to grow giant kelp (*Macrocystis pyrifera*) in Southern California. ICES Journal of Marine Science 59: S201-S207.

Douros, W.J. 1985. Density, growth, reproduction, and recruitment in an intertidal abalone: Effects of intraspecific competition and prehistoric predation. Master's Thesis. Unversity of California Santa Barbara, Santa Barbara, CA.

Drost, C. A. and G. M. Fellers. 1991. Density cycles in an island population of deer mice, *Peromyscus maniculatus*. Oikos 60:351-364.

Dugan, J.E., Hubbard, D.M., Engle, J.M., Martin, D.L., Richards, D.M., Davis, G.E., Lafferty, K.D., and R.F. Ambrose. 2000. Macrofauna communities of exposed sandy beaches on the Southern California mainland and Channel Islands. Fifth California Islands Symposium, OCS Study, MMS 99-0038: 339-346.

Ehrlich, P.R., D.S. Dobkin, and D. Wheye. 1988. The Birders Handbook. Simon and Schuster, New York. 785 pp.

Engle, J.M. 1994. Perspectives on the structure and dynamics of nearshore marine assemblages of the California Channel Islands. The Fourth California Islands Symposium: update on the status of resources (ed. by W.L. Halvorson and G.J. Maender), pp. 13-26. Santa Barbara Museum of Natural History, Santa Barbara, CA.

Engle JM, Miller KA. 2003. Distribution and morphology of eelgrass (*Zostera marina L.*) at the California Channel Islands. In: Garcelon D.K. and Schwemm C.A. (Eds.). Proceedings of the Sixth California Islands Symposium. Institute for Wildlife Studies, Arcata, 405-414.

Estes, J.A. Hatfield, B.B., Ralls, K., and J. Ames. 2003. Causes of mortality in California sea otters during periods of population growth and decline. Marine Mammal Science 19: 198-216.

Estes, J.A. and J.L. Bodkin. 2002. Otters. In Encyclopedia of Marine Mammals (W.F. Perrin, B. Wursig, and J.G.M. Thewissen editors). Academic Press, San Diego, California. pp. 842-858.

Estes, J.A. and R.J. Jameson. 1988. A double-survey estimate for sighting probability of sea otters in California. Journal of Wildlife Management. 52: 70-76.

Estrada, D. 1985. Soil Survey of Channel Islands Area, California: San Nicolas Island. Interim Publication, National Cooperative Soil Survey. Soil Conservation Service, Washington, D.C.

Fellers, G.M., Drost, C.A., Muntz, W.J., and T. Murphey. 1998. Ecology of the Island Night Lizard, *Xantusia riversiana*, on San Nicolas Island, California. U.S. Navy, Point Mugu and Biological Research Division, U.S. Geological Survey, Point Reyes National Seashore, California.

Fischer, D.T., C.J. Still, and A.P. Williams. 2008. Significance of summer fog and overcast for drought stress and ecological functioning of coastal California endemic plant species. Journal of Biogeography. Blackwell Publishing Ltd.

Foreman, R. 1967. Observations on the flora and ecology of San Nicolas Island. Report USNRDL-TR-67-8 U.S. Naval Radiological Defense Laboratory, San Francisco, CA.

Foster, M. & Schiel, D.R. (1985) The ecology of giant kelp forests in California: a community profile. US Fish and Wildlife Service Biological Report 85 (7.2), USA: 152 pp.

Friedman, C.S., Andree, K.B., Beauchamp, K.A., Moore, J.D., Robbins, T.T., Shields, J.D., and R.P. Hedrick. 2000. '*Candidatus Xenohaliotis californiensis*', a newly described pathogen of abalone, *Haliotis* spp., along the west coast of North America. International Journal of Systematic and Evolutionary Microbiology 50: 847-855.

Gallo-Reynoso, J.P. 1994. Factors affecting the population status of Guadalupe fur seal, *Artocephalus townsendi* (Merriam, 1897) at Isla de Guadalupe, Baja California, Mexico. Ph.D. Dissertation, University of California, Santa Cruz, CA. 199 pp.

Garcelon, D. 2009. Personal communication as cited in USFWS 2009. President. Institute for Wildlife Stuides, Arcata, CA.

Garcelon, D. K. and B.R. Hudgens. 2009. Island Fox Monitoring and Demography on San Nicolas Island–2007. Unpublished report prepared by the Institute for Wildlife Studies, Arcata, California.

Garcelon, D. K., and G. A. Schmidt. 2005. Island Fox Monitoring and Demography on San Nicolas Island–2004. Unpublished report prepared by the Institute for Wildlife Studies, Arcata, California. 24pp.

Gaston, A.J., Dechesne, S.B.C. 1996. Rhinoceros auklet (*Cerorhinca monocerata*). In: The Birds of North America, No. 212. A. Poole and F. Gill (Eds.). The Academy of Natural Sciences, Philadelphia, PA, and the American Ornithologists' Union, Washington, D.C.

Gerard, V.A. 1976. Some aspects of material dynamics and energy flow in a kelp forest in Monterey Bay, California. Ph.D. dissertation, University of California Santa Cruz, Santa Cruz, California.

Gill, A. E. 1980. Evolutionary genetics of California Islands *Peromyscus*. In: Power, D. M. (ed.), The California Islands: Proceedings of a multidisciplinary symposium. Santa Barbara Museum of Natural History, Santa Barbara, CA.

Graham, M. H. 2004. Effects of local deforestation on the diversity and structure of southern California giant kelp forest food webs. Ecosystems 7:341-357.

Graham, M.H., Dayton PK, Erlandson JM. 2003. Ice ages and ecological transition on temperate coasts. Trends Ecol Evol 18:33-40.

Gerard, V. A,. 1976. Some aspects of material dynamics and energy flow in a kelp forest in Monterey Bay, California [PhD dissertation]. Santa Cruz: University of California. p173.

Goldberg, S. R., and R. L. Bezy. 1974. Reproduction in the island night lizard, *Xantusia riversiana*. Herpetologica 30:350-360.

Gress, F., Risebrough, R.W., Anderson, D.W., Kiff, L.F., and J.R. Jehl Jr. 1973. Reproductive failures of double-crested cormorants in southern California and Baja California. Wilson Bull. 85: 197-208.

Haaker, P.L., Karpov, K., Rogers-Bennett, L., Taniguchi, I., Friedman, C.S., and M.J. Tegner. 2001. Abalone. In Leet, W.S., Dewees, C.M., Klingbeil, R., and E.J. Larson (Eds.). California's Living Marine Resources: A Status Report. California Department of Fish and Game. SG01-11. pp. 89-97.

Haaker, P.L., Parker, D.O., Togstad, H., Richards, D.V., Davis, G.E., and C.S. Friedman. 1992. Mass mortality and withering syndrome in black abalone, *Haliotis cracherodii*, in California. Pages 608 in S.A. Shepherd, M.J. Tegner, and S.A. Guzman del Proo (Eds.). Abalone of the world: Biology, fisheries, and culture. Proceedings of the 1st International Symposium on Abalone. Blackwell Scientific Publications Ltd., Oxford, U.K.

Haaker, P.L., Henderson, K.C., and D.O. Parker. 1986. California abalone. California Department of Fish and Game, Marine Resources Division, Long Beach, CA.

Halvorson, W.L., S. Junak, C. Schwemm, and T. Keeney. 1996. Plant communities of San Nicolas Island, California. Technical Report 55. National Biological Service, Cooperative Park Studies Unit, University of Arizona, Tuscon, AZ.

Hamilton, J. A. 2004. Kelp bed variability and fish population dynamics in Kachemak Bay, Alaska. M.S. thesis, 57 p. Univ. Alaska Fairbanks, Fairbanks, AK.

Hamilton, J., and B. Konar. 2007. Implications of substrate complexity and kelp variability for south-central Alaskan nearshore fish communities. Fish. Bull. 105:189-196.

Hanan, D.A. 1996. Dynamics of Abundance and Distribution for Pacific Harbor Seal, *Phoca vitulina richardsi,* on the Coast of California. Ph.D. Dissertation, University of California Los Angeles, Los Angeles, CA. 158 pp.

Harrold, C. & Reed, D.C. 1985. Food availability, sea urchin grazing, and kelp forest community structure. Ecology 66: 1160-1169.

Hatfield, B. 2007. Spring 2007 Mainland California Sea Otter Survey Results. U.S.G.S. Western Ecological Research Center, San Simeon, CA.

Heath, C.B. 2002. California, Galapagos, and Japanese sea lions *Zalophus californianus, Z. wollebaeki, and Z. japonicus*. Pp. 180-186 in W.F. Perrin, B. Wursig, and J.G.M. Thiewissen (Eds.). Encyclopedia of marine mammals. Academic Press.

Herder, M.J. 1986. Seasonal movements and hauling site fidelity of harbor seals, *Phoca vitulina richardsi*, tagged at the Russian River, California. MS Thesis. Humboldt State University. 52 pp.

Hillinger, C. 1958. The California Islands. Academy Publications, Los Angeles, CA.

Hobday, A.J. and M.J. Tegner. 2000. Status Review of White Abalone (*Haliotis sorenseni*) Throughout Its Range in California and Mexico. NOAA Technical Memorandum NMFS: NOAA-TM-NMFS-SWR-035.

Holbrook, S.J., Carr, M.H., Schmitt, R.J., Coyer, J.A. 1990. Effect of giant kelp on local abundance of reef fishes: the importance of ontogenetic resource requirements. Bulletin of Marine Science 47: 104-114.

Honma, L., 2008 Personnel Observations., Observations made during ASBS monitoring on San Nicolas Island in the Fall of 2008.

Horn, M.H. 1980. Diversity and ecological roles of non-commercial fishes in California marine habitats. California Cooperative Oceanic Fisheries Investigations Reports 21: 37-47.

Horn, M.H., Allen, L.G., and R.N. Lea. 2006. Biogeography. In Allen, L.G., Pondella, D.J. II, Horn, M.H. editors. The Ecology of Marine Fishes: California and Adjacent Waters. Berkeley, California: University of California Press. pp 3-25.

Howorth, P.C. 1978. The abalone book. Naturegraph Publishers, Inc., Happy Camp, CA.

Huber, H.R. 1991. Changes in the distribution of California sea lions north of the breeding rookeries during the 1982-1983 El Nino. In Pinnipeds and El Nino: response to environmental stress. F. Trillmich and K.A. Ono (Eds.). p. 129-137. Springer-Verlag, Berlin and Heidelberg, Germany.

Ingraham, N.L., and Matthews, R.A. 1995. The importance of fog-drip water to vegetation - Point Reyes Peninsula, California. Journal of Hydrology, 164, 269-285.

International Union for Conservation of Nature (IUCN). 2010. IUCN Red List of Threatened Species. Version 2010.1. <http://www.iucnredlist.org>. Accessed 2 June 2010.

Jacobs, D.F., Cole, D.W., and McBride, J.R. 1985. Fire history and perpetuation of natural Coast Redwood ecosystems. Journal of Forestry, 83, 494-497.

Jehl, J. R., Jr. 1985. Hybridization and evolution of oystercatchers on the Pacific Coast of Baja California. Neotropical Ornithology, A.O.U. monograph 36: 484-504.

Johansen, J.R., L.L. St. Clair, D. Evans, V. Flechtner, J. Balczon, and B.L. Webb. 1998. Resilience of Microbiotic Species to Military Training Pressures: Natural and Stimulated Recovery Following Disturbance. Technical Report (Contract DACA88-95-C-0015) USACERL. 210 pages.

Johnson, C.K., Tinker, M.T., Estes, J.A., Conrad, P.A., Staedler, M., Miller, M.A., Jessup, D.A., and J.A.K. Mazet. 2009. Prey choice and habitat use drive sea otter pathogen exposure in a resource limited coasta ecosystem. Proceedings of the National Academy of Sciences 106(7): 2242-2247.

Junak, S. 2008. A Flora of San Nicolas Island, California. Santa Barbara, CA: Santa Barbara Botanic Garden. 235 pp.

Junak, S. 2003. Sensitive Plant Survey, Outlying Landing Field, San Nicolas Island, California, Final Report. Prepared by the Santa Barbara Botanic Garden Technical Report No. 5. Prepared for Department of the Navy, Southwest Division, Naval Facilities Engineering Command and Environmental Planning and Management Department, Naval Air Weapons Station, China Lake, California, Letter of Agreement No. N68711-99-LT-90039.

Junak, S., Halvorson, W.L., Schwemm, C., and T. Keeney. 1996. Sensitive Plants of San Nicolas Island, California, Phase 2, Technical Report No. 57. United States Geological Survey, Cooperative Park Studies Unit, The University of Arizona, Tuscon, AZ.

Juola, F.A., G.A. Schmidt, P.B. Sharpe, and D.K. Garcelon. 2002. Island Fox Monitoring and Demography on San Nicolas Island-2001. Institute for Wildlife Studies, Arcata, California. 34pp.

Karpov, K.A., Haaker, P.L., Taniguchi, I.K., and L. Rogers-Bennett. 2000. Serial depletion and the collapse of the California abalone fishery. Pages 11-24 in A. Campbell, editor. Workshop on rebuilding abalone stocks in British Columbia. Canadian Special Publications, Fish and Aquatic Sciences.

Keitt, B., R.W. Henry, A.A. Munoz, C. Garcia, L.L. Mendoza, M.A. Hermosillo, B. Tershy, and D. Croll. 2005. El effecto de los gatos introducidos (*Felis catus*) en el ecosistema de Isla Guadalupe. In Isla Guadalupe restauracion y conservacion. K. S. d. Prado, and E. Peters (editors) pages 219-230. Instituto Nacional de Ecologia, Mexico City.

Kennedy, P.G., and Sousa, W.P. 2006. Forest encroachment into a Californian grassland: examining the simultaneous effects of facilitation and competition on tree seedling recruitment. Oecologia, 148, 464-474.

Kreuder, C., Miller, M.A., Jessup, D.A., Lowenstine, L.J., Harris, M.D., Ames, J.A., Carpenter, T.E., Conrad, P.A., and J.A.K. Mazet. 2003. Patterns of Mortality in Southern Sea Otters (*Enhydra lutris nereis*) from 1998-2001. Journal of Wildlife Diseases 39(3): 495-509.

Kushlan, J.A., Steinkemp, M.J., Parsons, K.C., Capp, J., Cruz, M.A., Coulter, M., Davidson, I., Dickson, L., Edelson, N., Elliot, R., Erwin, R.M., Hatch, S., Kress, S., Milko, R., Miller, S., Mills, K., Paul, R., Phillips, R., Saovoa, J.E., Sydeman, W., Trapp, J., Wheeler, J., and Wohl, K. 2002. Waterbird conservation for the Americas: The North America waterbird conservation plan, version 1. Waterbird Conservation for the Americas, Washington, D.C., USA.

Lafferty, K.D., Behrens, M.D., Davis, G.E., Haaker, P.L., Kushner, D.J., Richards, D.V., Taniguchi, I.K., and M.J. Tegner. 2004. Habitat of endangered white abalone, *Haliotis sorenseni*. Biological Conservation 116: 191-194.

Lafferty, K.D. and A.M. Kuris. 1993. Mass mortality of abalone *Haliotis cracherodii* on the California Channel Islands: tests of epidemiological hypotheses. Marine Ecology Progress Series 96: 239-248.

Le Boeuf, B.J., Crocker, D.E., Costa, D.P., Blackwell, S.B., Webb, P.M., and Houser, D.S. 2000. Foraging ecology of northern elephant seals. Ecological Monographs 70(3): 353-382.

Leet, W.S., C.M. Dewees, R. Klingbeil, and E.J. Larson (Eds.). 2001. California's living marine resources: A status report. California Department of Fish and Game.

Lerma, D., and Richards, D.V. 2000 Sand Beach and Coastal Lagoon monitoring, Santa Rosa Island, 1997 Annual Report. Technical Report CHIS-2000-01. Channel Islands National Park, Ventura, CA.

Lerma, D., 2009 Personnel observation 2009, Observations taken during brine discharge surveys January 2009.

Lever, C. 1985. Naturalized mammals of the world. Longman, London, NY.

Los Angeles Regional Water Quality Control Board (LARWQCB). 1994. Basin Plan for the Coastal Watershed of Los Angeles and Ventura Counties.Los Angeles, CA.

Lowe, S., Browne, M., Boudjelas, S., and M. De Poorter. 2000. 100 of the world's worst invasive alien species. A selection from the global invasive species database. The Invasive Species Specialist Group (ISSG) Species Survival Commission (SSC) of the World Conservation Union (IUCN), Auckland. 11 pages.

Lowry, M.S., Carretta, J.V., and K.A. Forney. 2008. Pacific harbor seal census in California during May-July 2002 and 2004. California Fish and Game 94(4): 180-193.

Lowry, M.S., Carretta, J.V., and K.A. Forney. 2005. Pacific harbor seal, *Phoca vitulina richardsi*, census in California during May-July 2004. Administrative Report LJ-05-06, available from Southwest Fisheries Science Center, La Jolla, CA. 38 pp.

Lowry, M. S., P. Boveng, R. J. DeLong, C. W. Oliver, B. S. Stewart, H. DeAnda, and J. Barlow. 1992. Status of the California sea lion (*Zalophus californianus californianus*) population in 1992. Admin. Rep. LJ-92-32. Southwest Fisheries Science Center, National Marine Fisheries Service, La Jolla, CA 92038. 34 pp. Mann K. H. 1973. Seaweeds: their productivity and strategy for growth. Science 182:975-81.

Lowry, M.S., Stewart, B.S., Heath, C.B., Yochem, P.K., and J.M. Francis. 1991. Seasonal and annual variability in the diet of California sea lions *Zalophus californianus* at San Nicolas Island, California, 1981-1986. Fishery Bulletin 89: 331-336.

Mad River Biologists (MRB). 2002. California Coastal National Monument Literature Search and Summarization of Key Biological Resources of the Monument - Seabirds and Marine Mammals. Prepared for Bureau of Land Management California Coastal National Monument.

Mann, K.H. (1973) Seaweeds: their productivity and strategy for growth. Science 182: 975-981.

Manuwal, D.A., Thorensen, A.C. 1993. Cassin's Auklet (*Ptychoramphus aleuticus*). In The Birds of North America, No. 50. A. Poole and F. Gill (Eds.). The Academy of Natural Sciences, Philadelphia, PA, and the American Ornithologists' Union, Washington, D.C.

McCann, T.S. 1985. Size, status and demography of southern elephant seal (*Mirounga leonina*) populations. In J.K. Ling and M.M. Bryden (Eds.). Studies of Sea Mammals in South Latitudes. South Australian Museum. 132 pp.

McChesney, G.J., Carter, H.R., Parker, M.W. 2000. Nesting ashy storm-petrels and Cassin's auklets in Monterey County, California. Western Birds 31: 178-183.

McRoy, C.P, and McMillan, C. (1977). Production ecology and physiology of seagrasses. In: P.C. McRoy and C Helfferich (eds.) Seagrass ecosystems: A Scientific Prospective, Marcel Dekker, New York, pp 53 ? 87.

Mearns, A.J., Allen, M.J., Moore, M.D., Sherwood, M.J. 1980. Distribution, abundance, and recruitment of softbottom rockfishes (*Scorpaenidae: Sebastes*) on the southern California mainland shelf. California Cooperative Oceanic Fisheries Investigations Reports 21: 180-190.

Melin, S.R. and R.L. DeLong. 1999. Observations of a Guadalupe Fur Seal (*Arctocephalus townsendi*) Female and pup at San Miguel Island, California. Marine Mammal Science. 15: 885-888.

Merkel & Associates, Inc. (M&AI). 2007a. Naval Base Ventura County, San Nicolas Island, Area of Special Biological Significance, Exception Application Package. Prepared for Division of Water Quality State Water Resources Control Board and Los Angeles Regional Water Quality Control Board.

Miller, S.E. and A.S. Menke. 1981. Entomological Bibliography of the California Islands. Occasional Papers, Santa Barbara Museum of Natural History. 11: 1-78

Miner, C.M., J.M. Altstatt, P.T. Raimondi, and T.E. Minchinton. 2006. Recruitment failure and shifts in community structure following mass mortality limit recovery prospects of black abalone. Marine Ecology Progress Series 327: 107-117.

Moody, A. 2000. Analysis of plant species diversity with respect to island characteristics on the Channel Islands, California. Journal of Biogeography 27(3): 711-723

Morrin, J.G., J.E. Kastendiek, A. Harrington, and N. Davis. 1988. Organisms of a subtidal sand community in southern California. Bulletin of the Southern California Academy of Sciences 87: 1-11.

Morris, R.H., Abbott, D.L., and E.C. Haderlie. 1980. Intertidal Invertebrates of California. Stanford University Press, Palo Alto, CA.

National Marine Fisheries Service (NMFS). 2008. White Abalone Recovery Plan (*Haliotis sorenseni*). National Marine Fisheries Service, Long Beach, CA.

National Marine Fisheries Service (NMFS). 2006. Biennial Report to Congress on the Recovery Program for Threatened and Endangered Species - October 1, 2004 - September 30, 2006. N. M. F. S. Office of Protected Resources, Silver Springs, MD: 185 pp

National Oceanic and Atmospheric Administration (NOAA). 2007a. California sea lion (*Zalophus californianus californianus*): U.S. Stock.

National Oceanic and Atmospheric Administration (NOAA). 2007b. Northern Elephant Seal (*Mirounga angustirostris*): California Breeding Stock.

National Oceanic and Atmospheric Administration (NOAA). 2003. Harbor seal (*Phoca vitulina richardsi):* California Stock.

National Oceanic and Atmospheric Administration (NOAA). 2001. Endangered and threatened species: endangered status for white abalone. 66 Federal Register 29046-29055.

National Weather Service. 2007. NWS Detroit/Pontiac weather glossary. Available at http://www.crh.noaa.gov/dtx/glossary.php.

Nature Serve. 2009. Nature Serve Explorer. <http://www.natureserve.org/explorer>.

Naval Air Warfare Center Weapons Division (NAWCWD). 2004. http://www.navair.navy.mil/nawcwd/weather/climatology/sni/sniclima.htm.

Noblet JA, EY Zeng, R Baird, RW Gossett, RJ Ozretich, and CR Phillips. 2003. Southern California Bight 1998 Regional Monitoring Program: VI. Sediment Chemistry. February 2003. Southern California Coast Water Research Project, Westminster, CA.

Nogales, M., Martin, A., Tershy, B.R., Donlan, C.J., Veitch, D., Puerta, N., Wood, B., and J. Alonso. 2004. A review of feral cat eradication on islands. Conservation Biology 18: 310-319.

North, W.J. 1994. Review of *Macrocystis* biology. In: Akatsuka, I. (Eds.). Biology of economic algae. The Hague: Academic. p 447- 527.

North, W.J. 1971. The biology of giant kelp beds (*Macrocystis*) in California: introduction and background. Nova Hedwigia 32: 1-68.

Oberbauer, T. 2002. Analysis of vascular plant species diversity of the Pacific Coast islands of Alta and Baja, California. Pp. 201-211 IN: D. Browne, K Mitchell, and H Chaney. (Eds.) Proceedings of the fifth California Islands symposium. 2 volumes. Santa Barbara Museum of Natural History, Santa Barbara, CA.

Odell, D.K. 1974. Seasonal Occurrence of the Northern Elephant Seal, *Mirounga angustirostris*, on San Nicolas Island, California. J. Mammal. 55:81-95.

Oliver, J.S., P.N. Slattery, L.W. Hulberg, and J.W. Nybakken. 1980. Relationships between wave disturbance and zonation of benthic invertebrate communities along a subtidal high energy beach in Monterey, California. U.S. National Marine Fisheries Service Fishery Bulletin 78: 437-454.

Orr, R.T. and C. Helm. 1989. Marine mammals of California, revised edition. Berkeley, CA: University of California Press. 93 pp.

Orrock, J. L., and B. F. Allan. 2008. Sin Nombre Virus infection in deer mice, Channel Islands, California. Emerging Infectious Diseases 14:1965-1966.

Page, G.W. and P.E. Persons. 1995. The snowy plover at Vandenberg Air Force Base: population size, reproductive success and management. Point Reyes Bird Observatory, Stinson Beach, CA. 24 pp. plus appendices.

Page, G.W., L.E. Stenzel, D.W. Winkler, and C.W. Swarth. 1983. Spacing out at Mono Lake: breeding success, nest density, and predation in the snowy plover. The Auk 100: 13-24.

Page, G.W. and L.E. Stenzel (Eds.). 1981. The breeding status of the snowy plover in California. Western Birds 12(1):1-40.

Paton, P. W. C. 1994. Survival estimates for Snowy plovers breeding at Great Salt Lake, Utah. Condor 96: 1106-1109.

Phillbrick, R. and J. Haller. 1977. The Southern California Islands. Pp. 893-906 in M. Barbour and J. Major (Eds.). Terrestrial vegetation of California. John Wiley and Sons, New York, NY.

Pilsbry. H.A. 1921. Manual of Conchology: Volume XXVI, Pupillidae. Academy of Natural Sciences of Philadelphia. Philadelphia, PA.

Pondella, D.J. II, Gintert, B.E., Cobb, J.R., and L.G. Allen. 2005. Biogeography of the nearshore rocky-reef fishes at the southern and Baja California islands. Journal of Biogeography 32: 187-201.

Powell, A.N., J.M. Terp, C.L. Collier, and B.L. Peterson. 1997. The status of western snowy plovers (*Charadrius alexandrinus nivosus*) in San Diego County, 1997. Report to the California Department of Fish and Game, Sacramento, CA, and U.S. Fish and Wildlife Service, Carlsbad, CA and Portland, OR. 34 pp.

Powell, A.N. and C.L. Collier. 1994. The status of western snowy plovers (*Charadrius alexandrinus nivosus*) in San Diego County, 1994. Report to California Department of Fish and Game, Sacramento, CA, and U.S. Fish and Wildlife Service, Portland, OR. 28 pp.

Powell, J. and C. Hogue. 1979. California Insects. University of California Press.

Ralls, K., Hatfield, B., and D.B. Siniff. 1995. Foraging patterns of California sea otters based on radiotelemetry. Canadian Journal of Zoology.

Ralls, K. and D.B. Siniff. 1990. Time budgets and activity patterns in California sea otters. Journal of Wildl. Management 54(2): 257-259.

Raven, P. 1967. The floristics of the California Islands. Pp. 57-67 IN: R. Philbrick. (ed.) Proceedings of the symposium on the biology of the California islands. Santa Barbara Botanic Garden, Santa Barbara, CA

Raven, P.H., and Axelrod, D.I. 1978. Origin and relationships of the California flora. University of California Publications in Botany 72.University of California Press, Berkeley, CA.,

Reeves, R.R., Stewart, B.S., Clapham, P.J., and J.A. Powell. 2002. National Audubon Society guide to marine mammals of the world. New York: Alfred A. Knopf.

Reeves, R.R., Stewart, B.S., and S. Leatherwood. 1992. The Sierra Club Handbook of seals and sirenians. San Francisco, CA: Sierra Club. 359 pp.

Richards, D.V. 2004 Sand Beach and Coastal Lagoon monitoring, Santa Rosa Island, 2004 Annual Report. Technical Report CHIS-2004-05. Channel Islands National Park, Ventura, CA.

Richards, D.V. and G.E. Davis. 1993. Early warnings of modern population collapse in black abalone Haliotis cracherodii, Leach, 1814 at the California Channel Islands. Journal of Shellfish Research 12: 189-194.

Ricketts, E. F., J. Calvin, J. W. Hedgpeth, and D. W. Phillips. 1985. Between Pacific Tides. Stanford, CA, Stanford University Press.

Rodriguez S, Santiago ART, Shenker G. 2001. A public-access GIS-based model of potential species habitat distribution for the Santa Barbara Channel and the Channel Islands National Marine Sanctuary, Donald Bren School of Environmental Science and Management: 130 pp.

Roemer, G.W., Coonan, T.J., Munson, L., and R.K. Wayne. 2004. Island fox, Urocyon littoralis. Canid action plan for the Island fox. In Canids: foxes, wolves, jackals, and dogs. Status Survey and conservation action plan. In C. Sillero-Zuiri, M. Hoffman, and D.W. Macdonald (Eds.). pp. 97-105. IUCN/SSC, Canid Specialist Group, IUCN Publications Services Unit, Cambridge, United Kingdom.

Rogers-Bennett, L., Haaker, P.L., Huff, T.O., and P.K. Dayton. 2002. Estimating baseline abundance of abalone in California for restoration. CalCOFI Reports 43: 97-111.

Saul, S.M. 1982. Clam diggers and snowy plovers. Washington Wildlife 32(1): 28-30.

Schmidt, G.A., Hudgens, B.R., and D.K. Garcelon. 2007. Island fox monitoring and demography on San Nicolas Island - 2006. Institute for Wildlife Studies, Arcata, California. 26 pp.

Schmidt, G. A., B. R. Hudgens, and D. K. Garcelon. 2006. Island Fox Monitoring and Demography on San Nicolas Island–2005. Unpublished report prepared by the Institute for Wildlife Studies, Arcata, California. 24pp.

Schmidt, G. A., and D. K. Garcelon. 2004. Island Fox Monitoring and Demography on San Nicolas Island–2003. Unpublished report prepared by the Institute for Wildlife Studies, Arcata, California. 24pp.

Schmidt, G. A., and D. K. Garcelon. 2003. Island Fox Monitoring and Demography on San Nicolas Island–2002. Unpublished report prepared by the Institute for Wildlife Studies, Arcata, California. 22pp.

Seagars, D.J. 1984. The Guadalupe fur seal: a status review. Administrative Report SWR-84-6. Southwest Region, National Marine Fisheries Service, Terminal Island, CA.

Seapy, R.R. and M.M. Littler. 1980. Biogeography of rocky intertidal macroinvertebrates of the southern California islands. In: D.M. Power (ed.) The California Islands: Proceedings of a Multidisciplinary Symposium. Haagen Printing, Santa Barbara, CA. pp. 307-324.

Sibley, D. 2001. The Sibley Guide to Bird Life and Behavior. Chanticleer Press, Inc., New York, NY.

Smith, G.G. 1993. Special Plants and Animals at Naval Air Weapons Station, Point Mugu, California. 117 pp.

Smith, R.I., and J.T. Carltonn (Eds.). 1975. Light's Manual: Intertidal invertebrates of the central California coast. Third Edition. University of California Press, Berkeley, CA. 716 pp.

State Water Resources Control Board (SWRCB) and California Regional Water Quality Control Boards (RWQCB). 1970. SWRCB and California RWQCB's Administrative Procedures, September 24, 1970, Section XI, Miscellaneous (Rev. 7-9/1/1972), Designation of Areas of Special Biological Significance.

Stebbins, Robert C. 2003. A Field Guide to Western Reptiles and Amphibians. New York, New York. Houghton Mifflin Company.

Steneck, R. S., M. H. Graham, B. J. Bourque, D. Corbett, J. M. Erlandson, J. A. Estes, and M. J. Tegner. 2002. Kelp forest ecosystems: biodiversity, stability, resilience, and future. Environ. Cons. 29:436?459.

Stenzel, L.E., Warriner, J.C., Warriner, J.S., Wilson, K.S., Bidstrup, F.C., and G.W. Page. 1994. Long-distance breeding dispersal of snowy plovers in western North America. Journal of Animal Ecology 63: 887-902.

Stewart, B. S. 1997. "Ontogeny of differential migration and sexual segregation in northern elephant seals." Journal of Mammalogy 78(4): 1101-1116.

Stewart, B.S., and R.L. DeLong. 1995. Double migrations of the northern elephant seal, *Mirounga angustirostris*. Journal of Mammalogy 76(1): 196-205.

Stewart, B.S. and P.K. Yochem. 1994. Ecology of harbor seals in the Southern California Bight. In W.L. Halvorson and G.J. Maender (Eds.), The Fourth California Islands Symposium: Update on the status of resources, p. 123-134. Santa Barbara Museum of Natural History, Santa Barbara, CA.

Stewart, B.S., and H.R. Huber. 1993. *Mirounga angustirostris*. Mammalian Species 449: 1-10.

Stewart, B.S., and R.L. DeLong. 1989. The Ecology and Population Biology of the Northern Elephant Seal, Mirounga angustirostris Gill 1866, on the Southern California Channel Islands. Ph.D. Dissertation, University of California Los Angeles, Los Angeles, CA. 195 pp.

Stewart, B.S. and P.K. Yochem. 1984. Seasonal abundance of pinnipeds on San Nicolas Island, California, 1980-1982. Bulletin of the Southern California Academy of Sciences 83: 121-132.

Suckling, K. and Garcelon, D.K. 2000. Petition to list four island fox subspecies as Endangered. Petition submitted to the U.S. Fish and Wildlife Service, 1 June 2000. Center for Biological Diversity, Tuscon, Arizona, and Institute for Wildlife Studies, Arcata, California, USA.

Tierra Data, Inc. (TDI). 2009. Vegetation Condition Evaluation Report, Outlying Landing Field, San Nicolas Island, San Nicolas Island, California. Prepared for: Naval Base Ventura County, San Nicolas Island Environmental Division.

University of California Santa Cruz (UCSC) California Institute of Environmental Studies (CIES). 2006. More signs of return for California brown pelicans. UCSC Currents Online, Volume 10, Number 41, June 12-18 2006. http://currents.ucsc.edu/05-06/06-12/pelicans.asp.

U.S. Army Corps of Engineers (USACE). 2008. Wetland delineation of San Nicolas Island.

U.S. Department of the Navy (DON). 2007. San Nicolas Island Seabird Restoration: Project Plan for Cat Eradication April 2007. Prepared by Island Conservation for U.S. Navy Environmental Department, Outlying Landing Field, San Nicolas Island, Ventura County, CA and Naval Facilities Engineering Command, Southwest, San Diego, CA, and Montrose Settlements Trustee Council under Cooperative Agreement N68711-05-LT-A0039.

U.S. Department of the Navy (DON). 2005a. Integrated Natural Resources Management Plan for San Nicolas Island, California, 2006-2010. 135 pp.

U.S. Department of the Navy (USDON). 1998. Point Mugu Sea Range marine mammal technical report. Point Mugu Sea Range Environmental Impact Statement/Overseas Environmental Impact Statement. Prepared by LGL Limited, Ogden Environmental and Energy Services, Naval Air Warfare Center Weapons Division, and Southwest Division Naval Facilities Engineering Command. 281 pp.

U.S. Fish and Wildlife Service (USFWS). 2009. 2009 Summer Window Survey for Snowy Plovers on U.S. Pacific Coast with 2005-2008 Results for Comparison. <http://www.fws.gov/arcata/es/birds/WSP/documents/2009%20Pacific%20Coast%20breeding%20SNPL%20survey.pdf>.

U.S. Fish and Wildlife Service (USFWS). 2009a. Final Environmental Assessment for the Restoration of San Nicolas Island's Seabirds and Protection of other Native Fauna by Removing Feral Cats. Report on behalf of the Montrose Natural Resources Trustee Council and U.S. Navy. pp. 79.

U.S. Fish and Wildlife Service (USFWS). 2009b. Southern Sea Otter Spotlight Species Action Plan 2010-2014.

U.S. Fish and Wildlife Service (USFWS). 2008. Birds of Conservation Concern 2008. United States Department of Interior, Fish and Wildlife Service, Division of Migratory Bird Management, Arlington, Virginia. 85 pp. <http://www.fws.gov/migratorybirds/>.

U.S. Fish and Wildlife Service (USFWS). 2007. Listed distinct population segment of the brown pelican (*Pelecanus occidentalis*), 5 Year Review: Summary and Evaluation. http://www.fws.gov/arcata/es/birds/brnPelican/documents/2007.

U.S. Fish and Wildlife Service (USFWS). 2006. News Release: SERVICE INITIATES REVIEW OF ISLAND NIGHT LIZARD TO DETERMINE IF REMOVAL FROM ESA PROTECTION IS WARRANTED. U.S. Fish & Wildlife Service Carlsbad Fish and Wildlife Office 6010 Hidden Valley Road, Carlsbad, California 92011. http://www.fws.gov/carlsbad/NR/Inl_delisting_findings_nr.pdf. Accessed 21 February 2010.

U.S. Fish and Wildlife Service (USFWS). 2005. Regional seabird conservation plan, Pacific region. U.S. Fish and Wildlife Service, Migratory Birds and Habitat Programs, Pacific Region, Portland, Oregon.

U.S. Fish and Wildlife Service (USFWS). 2004. Endangered and threatened wildlife and plants; listing the San Miguel Island fox, Santa Rosa Island fox, Santa Cruz Island fox, and Santa Catalina Island fox as Endangered. 69 FR 10335.

U.S. Fish and Wildlife Service (USFWS). 2003. Final Revised Recovery Plan for the Southern sea otter (*Enhydra lutris nereis*). Portland, Oregon. 165 pp.

U.S. Fish and Wildlife Service (USFWS). 1988. Endangered and Threatened Wildlife and Plants; Technical Amendments to the Sea Otter Translocation Regulations. Federal Register. D. o. I. U.S. Fish and Wildlife Service (USFWS). 53: 37577-37581.

U.S. Fish and Wildlife Service (USFWS). 1987a. Endangered and Threatened Wildlife and Plants; Establishment of an Experimental Population of Southern Sea Otters; Final Rule. Federal Register. D. o. I. U.S. Fish and Wildlife Service (USFWS). 52: 29754-29784.

U.S. Fish and Wildlife Service (USFWS). 1987b. Final Environmental Impact Statement: Translocation of southern sea otters. O. o. S. O. C. Prepared by U.S. Fish and Wildlife Service, Sacramento, California, and Institute of Marine Sciences, University of California, Santa Cruz, California.

U.S. Fish and Wildlife Service (USFWS). 1976. Proposed Endangered or Threatened Status for 32 U.S. Snails. Federal Register 41(83): 17742-17747.

U.S. Geological Survey (USGS). 2003. USGS WERC Fact Sheet, Rare Plants in Channel Island National Park. http://www.werc.usgs.gov/fs/rareplants.pdf. Accessed 2 September 2009.

VanBlaricom, G.R. Unpublished Data. January through November 2008 long term black abalone population monitoring program data.

VanBlaricom, G.R. 1993. Dynamics and distribution of black abalone populations at San Nicolas Island, California. Pages 323-334 in F. G. Hochberg, editor. Third California Islands Symposium: recent advances in research on the California Islands. Santa Barbara Museum of Natural History, Santa Barbara, CA.

VanBlaricom, G.R. 1978. Distribution, predation, and resource allocation in a high-energy sand-bottom ecosystem; Experimental analysis of critical structuring processes for the infaunal community. Ph.D. Dissertation, University of California San Diego. 328 pp.

Vantuna Research Group (VRG). 2009. Fisheries Inventory and Utilization of San Diego Bay, San Diego, California for Surveys Conducted in April and July 2008.

Vedder J. and D. Howell. 1980. Topographic evolution of the southern California borderland during late Cenozoic time. Pp. 7-31 IN: D.Power (ed.) The California Islands: proceedings of a multi-disciplinary symposium. Santa Barbara Museum of Natural History, Santa Barbara, CA.

Vedder, J. and R. Norris. 1963 Geology of San Nicolas Island, California. U.S. Geological Survey Professional Paper 369, U.S. Government Printing Office, Washington D.C. 65 pp., maps

von Bloeker, J. C. 1967. The land mammals of the southern California islands. - In: Philbrick, R. N. (ed.), Proceedings of the symposium on the biology of the California Islands. Santa Barbara Botanic Garden, pp. 245-263.

Wallace, G. 1985. Vascular plants of the Channel Islands of southern California and Guadalupe Island, Baja California, Mexico. Natural history Museum of Los Angeles County, Contributions in Science 365:1-136.

Wallace, E. A. H and G.E. Wallace. 1998. Brandt's Cormorant. In The Birds of North America: Life Histories for the 21st Century. No. 362. A. Poole and F. Gill (Eds.). The Academy of Natural Sciences, Philadelphia, PA and the American Ornithologists' Union, Washington, D.C.

Warriner, J.S., Warriner, J.C., Page, G.W., and L.E. Stenzel. 1986. Mating system and reproductive success of a small population of polygamous snowy plovers. Wilson Bulletin 98(1): 15-37.

Wayne, R.K. George, S.B., Gilbert, D, and P.W. Collins. 1991a. The Channel Island fox (*Urocyon littoralis*) as a model of genetic change in small populations. Pp. 639-649 in Dudley, E.C., (ed.), The Unity of Evolutionary Biology: Proceedings of the Fourth International Congress of Systematic and Evolutionary Biology, Vol II. Discorides Press, Portland, Oregon.

Wayne, R.K., George, S.B., Gilbert, D., Collins, P.W., Kovach, S.D., Girman, D., and N. Lehman. 1991b. A morphological and genetic study of the Island fox, *Urocyon littoralis*. Evolution 45(8): 1849-1868.

Wehtje, W. 2000. Status, Distribution and Habitat Associations of Six Breeding Land Bird Species on San Nicolas Island. Prepared for NAWS/CL by the Santa Barbara Museum of Natural History.

Weseloh, C.V.C, Pekarik, C., and Blokpoel, H. 1999. Breeding populations of cormorants, gulls, and terns of the Canadian Great Lakes in 1997/1998. Bird Trends (Canadian Wildlife Service) 7:30-34.

Western Regional Climate Center (WRCC). 2009. http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca7870. Accessed 20 August 2009.

Wharton, W.G. and K.H. Mann. 1981. Relationships between destructive by the sea urchin *Strongylocentrus droebachienisi*, and the abundance of the American lobster *Homarus americanus* on the Atlantic coast of Nova Scotia. Canadian Journal of Fisheries and Aquatic Science 83: 1339-1349.

Whittaker, R.J. 1998. Island biogeography: ecology, evolution, and conservation. Oxford University Press, Oxford; New York, NY.

Widrig, R.S. 1980. Snowy plovers at Leadbetter Point: An opportunity for wildlife management? Prepared for the U.S. Fish and Wildlife Service, Willapa NWR, Ilwaco, WA. 14 pp.

Wilson, D.E., Bogan, M.A., Brownell, R.L., Burdin Jr., A.M., and M.K. Maminov. 1991. Geographic variation in sea otters, Enhydra lutris. J. Mamm. 72(1): 22-36.

Wilson, R.A. 1980. Snowy plover nesting ecology on the Oregon coast. MS Thesis, Oregon State University, Corvallis. 41 pp.

Wilson-Jacobs, R. and G.L. Dorsey. 1985. Snowy plover use of Coos Bay north spit, Oregon. Murrelet 66(3):75-81.

Wolf, S.G. 2002. The relative status and conservation of island breeding seabirds in California and northwest Mexico. M. Sc. Thesis. University of California, Santa Cruz, California.

Wyda, J. C., L. A.Deegan, J. E. Hughes, and M. J. Weaver (2002). "The response of fishes to submerged aquatic vegetation complexity in two ecoregions of the Mid-Atlantic Bight: Buzzards Bay and Chesapeake Bay," Estuaries 25, 86-100.

Zobell CE. 1971. Drift seaweeds on San Diego County beaches. Nova Hedwigia 32:269-314.

7.4 Chapter 4

Agri Chemical and Supply, Inc. 2009. Invasive Plant Control on OLF San Nicolas Island- 2008 Report. Prepared for Natural Resources Office, Commander Navy Region Southwest, Under Contract with Southwest Division, Naval Facilities Engineering Command, Contract # N^8711-04-D-3604, Task Order 0059.

Benton, N., J.D. Ripley, and F. Powledge (Eds.). 2008. Conserving Biodiversity on Military Lands: A Guide for Natural Resource Managers, 2008 Edition. Nature Serve: Arlington, Virginia. <http://www.dodbiodiversity.org>.

Bunn, D., A. Mummert, M. Hoshovsky, K. Gilardi, and S. Shanks. 2007. California Wildlife: Conservation Challenges, California's Wildlife Action Plan. Prepared by the U.C. Davis Wildlife Health Center for the California Department of Fish and Game, Sacramento, CA.

Bureau of Land Management (BLM). 2005. California Coastal National Monument Resource Management Plan.

Butler, J., DeVogelaere, A., Gustafson, R., Mobley, C., Neuman, M., Richards, D., Rumsey, S., Taylor, B., G. VanBlaricom. 2009. Status Review Report for Black Abalone (*Haliotis cracherodii,* Leach, 1814). National Marine Fisheries Service, Southwest Region, Long Beach, CA.

California Coastal Commission (CCC). 1997. California Coastal Commission Strategic Plan, June 1997.

California Department of Fish and Game (CDFG). 2002. Nearshore Fishery Management Plan. Prepared by the California Resources Agency, Department of Fish and Game, Marine Region, August 2002.

California Department of Transportation (Caltrans). 2000. Construction Site Best Management Practices (BMPs) Manual. State of California, Department of Transportation, November 2000.

Caplan, R.I. and R.A. Boolootian. 1967. Intertidal Ecology of San Nicolas Island. Proceedings of the Symposium on the Biology of the California Islands. Santa Barbara, California.

Carter, H.R., McChessney, G.J., Jaques D.L., Strong, C.S., Parker, M.W., Takekawa, J.E., Jory, D.L., and Whitworth, D.L. 1992. Breeding Populations of Seabirds in California, 1989-1991. Vol. 1 - Population Estimates, Unpublished Final Report, U.S. Fish and Wildlife Service, Northern Prairie Wildlife Research Center, Dixon, California.

Council on Environmental Quality (CEQ), U.S. Department of Agriculture (USDA), U.S. Department of the Army (U.S. Army), U.S. Department of Commerce (USDOC), U.S. Department of Defense (USDOD), U.S. Department of Energy (USDE), U.S. Department of Housing and Urban Development (USDHUD), U.S. Department of the Interior (USDOI), U.S. Department of Justice (USDOJ), U.S. Department of Labor (USDOL), U.S. Department of State (USDOS), U.S. Department of Transportation (USDOT), Environmental Protection Agency (EPA), Office of Science and Technology Policy (OSTP). 1995. Memorandum of Understanding between CEQ, USDA, U.S. Army, USCD, USDOD, USDOE, USDHUD, USDOI, USDOJ, USDOL, USDOS, USDOT, EPA and OSTP to Foster the Ecosystem Approach.

Coonan, T. J. 2003. Recovery strategy for island foxes (*Urocyon littoralis*) on the northern Channel Islands. National Park Service, Channel Islands National Park, Ventura, CA. 81 pp.

Cohen, A. N., and J. T. Carlton. 1998. Accelerating invasion rate in a highly invaded estuary. Science 279: 555-558.

Crooks, J. A. 1998.Habitat alteration and community level effects of an exotic mussel, *Musculista senhousia*. Marine Ecology Progress Series 162: 137-152.

Dale, Virginia H. and Suzanne C. Beyeler. 2001. Challenges in the development and use of ecological indicators. Ecological Indicators 1:3-10.

Davis GE (2005) National Park stewardship and 'vital signs' monitoring: a case study from Channel Islands National Park, California. Aquatic Conserv. Mar. Freshw. Ecosyst. 15:71-89.

Fischlin, A., Midgley, G.F., Price, J.T., Leemans, R., Gopal, B., Turley, C., Rounsevell, M.D.A., Gallo-Reynoso, J-P. and Rathbun, G.B. 2007. Status of sea otters (*Enhydra lutris*) in Mexico. Marine Mammal Science 13(2): 332-340, 1997.

Grossman D.H., Faber-Langendoen D., Weakley A.S., Anderson M., Bourgeron P., Crawford R., Goodin K., Landaal S., Metzler K., Patterson K.D., Pyne M., Reid M., and Sneddon L. 1998. International classification of ecological communities: terrestrial vegetation of the United States. Volume I, The National Vegetation Classification System: development, status, and applications. The Nature Conservancy: Arlington, VA.

Halvorson, W.L., S. Junak, C. Schwemm, and T. Keeney. 1996. Plant communities of San Nicolas Island, California. Technical Report 55. National Biological Service, Cooperative Park Studies Unit, University of Arizona, Tucson, AZ.

Hierl, Lauren A., J. Franklin, D. H. Deutschman, H. M. Regan, and B. S. Johnson. 2008. Assessing and Prioritizing Ecological Communities for Monitoring in a Regional Habitat Conservation Plan. Environmental Management, Volume 42, Issue 1, pp.165-179.

Junak S. 2003. Distribution of selected invasive plant species on San Clemente Island, California. Santa Barbara Botanic Garden Technical Report No. 6 submitted to Kim O'Connor, Southwest Division, Naval Facilities and Engineering Command.

Junak, S., W.L. Halvorson, , C. Schwemm, and T. Keeney. 1996. Sensitive Plants of San Nicolas Island, California, Phase 2, Technical Report No. 57. United States Geological Survey, Cooperative Park Studies Unit, The University of Arizona, Tuscon, AZ.

Junak S., T. Ayers, R. Scott, D. Wilken, and D. Young. 1995. *A Flora of Santa Cruz Island*. Santa Barbara Botanic Garden and California Native Plant Society, Santa Barbara and Sacramento, CA. 397 pp.

Keystone Center. 1996. Keystone Center Policy Dialogue on a Department of Defense (DoD) Biodiversity Management Strategy. T. K. Center. Keystone, Colorado.

Los Angeles Regional Water Quality Control Board (LARWQCB). 1994. Basin Plan for the Coastal Watershed of Los Angeles and Ventura Counties. Los Angeles, CA.

Merkel & Associates, Inc. (M&AI). 2007a. Naval Base Ventura County, San Nicolas Island, Area of Special Biological Significance, Exception Application Package. Prepared for Division of Water Quality State Water Resources Control Board and Los Angeles Regional Water Quality Control Board.

National Invasive Species Council (NISC). 2008. National Invasive Species Management Plan 2008-2012.

National Invasive Species Council (NISC). 2001. Meeting the Invasive Species Challenge: Management Plan, National Invasive Species Council, 2001.

National Research Council. 1990. Monitoring Academy Press, Washington, D.C.

National Marine Fisheries Service (NMFS). 2009d. http://www.nmfs.noaa.gov/pr/species/invertebrates/whiteabalone.htm. Accessed 29 December 2009.

National Marine Fisheries Service (NMFS). 2008a. White Abalone Recovery Plan (*Haliotis sorenseni*), Draft. National Marine Fisheries Service, Long Beach, CA.

National Marine Fisheries Service (NMFS). 2001. Endangered and threatened species: Endangered status for white abalone. Federal Register 66(103):29046-29055.

Naval Base Ventural County (NBVC) San Nicolas Island (SNI). 2010. Storm Water Pollution Prevention Plan. Prepared by Jonas and Associates under Contract Number N62473-08-D-8811 and Contract Task Order No. 0003.

Ralph, C.J., G.R. Geupel, P. Pyle, T.E. Martin, and D.F. DeSante 1993. Handbook of Field Methods for Monitoring Landbirds. U.S. Dept. of Agri. For. Ser. Gen. Tech. Rep. PSW-GTR-144

Reusch, T.B.H. and S.L. Williams. 1998. Variable responses of a native eelgrass Zostera marina to a non-indigenous bivalve *Musculista senhousia*. Oecologia 113: 428-441.

Rich, T. D., C. J. Beardmore, H. Berlanga, P. J. Blancher, M. S. W. Bradstreet, G. S. Butcher, D. W. Demarest, E. H. Dunn, W. C. Hunter, E. E. Iñigo-Elias, J. A. Kennedy, A. M. Martell, A. O. Panjabi, D. N. Pashley, K. V. Rosenberg, C. M. Rustay, J. S. Wendt, T. C. Will. 2004. Partners in Flight North American Landbird Conservation Plan. Cornell Lab of Ornithology. Ithaca, NY. http://www.partnersinflight.org/cont_plan/ (VERSION: March 2005).

Riedman, M.L., and J.A. Estes. 1990. The sea otter (Enhydra lutris): behavior, ecology, and natural history. U.S. Fish and Wildlife Service, Biological Report. 90(14). 126 pp.

Sawyer, J. O., and T. Keeler-Wolf. 1995. A manual of California vegetation. California Native Plant Society. Sacramento, California.

State Water Resources Control Board (SWRCB) and California Regional Water Quality Control Boards (RWQCB). 1970. SWRCB and California RWQCB's Administrative Procedures, September 24, 1970, Section XI, Miscellaneous (Rev. 7-9/1/1972), Designation of Areas of Special Biological Significance.

Tierra Data, Inc. (TDI). 2009. Vegetation Condition Evaluation Report, Outlying Landing Field, San Nicolas Island, San Nicolas Island, California. Prepared for: Naval Base Ventura County, San Nicolas Island Environmental Division.

U.S. Army Corps of Engineers (USACE). 2008. Wetland delineation of San Nicolas Island.

U.S. Department of the Navy (USDON). 2007. Environmental and Natural Resources Program Manual (OPNAVINST 5090.1C).

U.S. Department of the Navy (USDON). 2005a. Integrated Natural Resources Management Plan for San Nicolas Island, California, 2006-2010. 135 pp.

U.S. Environmental Protection Agency (USEPA). 2008. Climate Change on Aquatic Invasive Species and Implications (Final Report Feb. 2008).

U.S. Fish and Wildlife Service (USFWS). 2009 Final Environmental Assessment for the Restoration of San Nicolas Island's Seabirds and Protection of the other Native Fauna by Removing Feral Cats (Final Report; March 2009).

U.S. Fish and Wildlife Service (USFWS). 2007. Recovery Plan for the Pacific Coast Population of the Western snowy plover (*Charadrius alexandrinus nivosus*) California/Nevada Operations Office, Sacramento, California.

U.S. Fish and Wildlife Service (USFWS). 2003. Final Revised Recovery Plan for the Southern Sea Otter (*Enhydra lutris nereis*). Portland, Oregon. 165 pp.

U.S. Fish and Wildlife Service (USFWS). 2001. Biological Opinion (BO) for Activities on San Nicolas Island, California.

U.S. Fish and Wildlife Service (USFWS) / National Marine Fisheries Service (NMFS). 1998. Endangered Species Consultation Handbook, Procedures for Conducting Consultation and Conference Activities Under Section 7 of the Endangered Species Act.

VanBlaricom, G. R. 1993. Dynamics and distribution of black abalone populations at San Nicolas Island, California. Pages 323-334 in F. G. Hochberg, editor. Third California Islands Symposium: recent advances in research on the California Islands. Santa Barbara Museum of Natural History, Santa Barbara, CA.

Wehtje, W. 2000. Status, Distribution and Habitat Associations of Six Breeding Land Bird Species on San Nicolas Island. Prepared for NAWS/CL by the Santa Barbara Museum of Natural History.

7.5 Chapter 5

Bunn, D., A. Mummert, M. Hoshovsky, K. Gilardi, and S. Shanks. 2007. California Wildlife: Conservation Challenges, California's Wildlife Action Plan. Prepared by the U.C. Davis Wildlife Health Center for the California Department of Fish and Game, Sacramento, CA.

Bureau of Land Management (BLM). 2005. California Coastal National Monument Resource Management Plan. U.S. Department of the Interior, Bureau of Land Management, California State Office, September 2005.

California Coastal Commission (CCC). 1997. California Coastal Commission Strategic Plan, June 1997.

California Department of Fish and Game (CDFG). 2008a. California Marine Life Protection Act: Master Plan for Marine Protected Areas. Prepared by the California Resources Agency, Department of Fish and Game, January 2008.

California Department of Fish and Game (CDFG). 2008b.California Aquatic Invasive Species Management Plan.

California Department of Fish and Game (CDFG). 2005. Final Abalone Recovery and Management Plan. Prepared by the California Resources Agency, Department of Fish and Game, Marine Region, 09 December 2005.

California Department of Fish and Game (CDFG). 2002. Nearshore Fishery Management Plan. Prepared by the California Resources Agency, Department of Fish and Game, Marine Region, August 2002.

California Department of Fish and Game (CDFG) and Office of Spill Prevention and Response (OSPR). 2005. California Wildlife Response Plan for California.

California Department of Transportation. 2003. Statewide Storm Water Management Plan. CTSW-RT-02-008. California Department of Transportation, Division of Environmental Analysis, Sacramento, CA.

California Energy Commission (CEC) and California Department of Fish and Game (CDFG). 2007. California Guidelines for Reducing Impacts to Birds and Bats from Wind Energy Development. Commission Final Report. California Energy Commission, Renewables Committee, and Energy Facilities Siting Division, and California Department of Fish and Game, Resource Management and Policy Division.

California Resources Agency (CRA) and California Environmental Protection Agency (CalEPA). 2004. Protecting Our Ocean: California's Action Strategy.

California Stormwater Quality Association (CASQA). 2003. California Stormwater BMP Handbook. (http://www.cabmphandbooks.com/Documents/Construction/SE-5.pdf).

California Department of Transportation (Caltrans). 2000. Construction Site Best Management Practices (BMPs) Manual. State of California, Department of Transportation, November 2000.

California Stormwater Quality Task Force. 2003. California Stormwater Best Management Practice Handbook, Construction Activity, Industrial, Commercial, Municipal, New Development and Redevelopment. Hayward, California: January 2003.

Camp Dresser & McKee *et al.* 1993. California Stormwater Industrial/Commercial Best Management Practice Handbook. Stormwater Quality Task Force, Sacramento, CA.

Center for Watershed Protection. 2003. Impacts of Impervious Cover on Aquatic Systems. Ellicott City, MD.

Channel Island National Park (CINP). 2010. <http://www.nps.gov/chis/parkmgmt/partners.htm>. Accessed 30 July 2010.

Coffman, Larry. 2000. Low-Impact Development Design Strategies, An Integrated Design Approach. EPA 841-B-00-003. Prince George's County, Maryland. Department of Environmental Resources, Programs and Planning Division.

Erickson, W.P., G.D. Johnson, M.D. Stickland, D.P. Young, Jr., K.J. Sernka, and R.E. Good. 2001. Avian Collisions with Wind Turbines: A Summary of Existing Studies and Comparisons to Other Sources of Avian Collision Mortality in the United States. The National Wind Coordinating Committee.

Forman, R. T. T., D. Sperling, J. A. Bissonette, A. P. Clevenger, C. D. Cutshall, V. H. Dale, L. Fahrig, R. France, C. R. Goldman, K. Heanue, J. A. Jones, F. J. Swanson, T. Turrentine, and T. C. Winter. 2003. *Road Ecology: Science and Solutions*. Island Press, Washington, D.C.

Intergovernmental Panel on Climate Change (IPCC). 2007. IPCC Fourth Assessment Report: Climate Change 2007. <http://www.ipcc.ch/publications_and_data/publications_and_data_reports.htm>.

Intergovernmental Panel on Climate Change (IPCC) Working Group II. 2007. Climate Change 2007 - Impacts, Adaptation, and Vulnerability: Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Fourth Assessment Report. I. P. o. C. Change. Cambridge, U.K., Cambridge University Press.

Los Angeles Regional Water Quality Control Board (LARWQCB). 2007. 2005-2007 Triennial Review for the Channel Islands Watershed Management Area.

Los Angeles Regional Water Quality Control Board (LARWQCB). 1994. Basin Plan for the Coastal Watershed of Los Angeles and Ventura Counties. Los Angeles, CA.

Nabhan, G.P. 1998. Cultures of Habitat: On Nature, Culture, and Story. Counterpoint; Washington, D.C.

National Oceanic and Atmospheric Administration (NOAA). 2009. Channel Islands National Marine Sanctuary Management Plan.

National Park Service (NPS). 2003. Channel Islands National Park Recovery Strategy for Island Foxes on the Northern Channel Islands.

National Park Service (NPS). 1985. Channel Islands National Park General Management Plan.

Naval Air Warfare Center Weapons Division (NAWCWD). 2002. Final Environmental Impact Statement/Overseas Environmental Impact Statement for Point Mugu Sea Range. Prepared by U.S. Department of the Navy, Naval Air Systems Command, Naval Air Warfare Center Weapons Division, Point Mugu, CA.

Naval Base Ventural County (NBVC) San Nicolas Island (SNI). 2010. Storm Water Pollution Prevention Plan. Prepared by Jonas and Associates under Contract Number N62473-08-D-8811 and Contract Task Order No. 0003.

Naval Facilities Engineering Command Southwest (NAVFACSW). 2010a. NBVC San Nicolas Island and Fort Hunter Liggett: Activity Overview Plan. Prepared by KTU+A under Naval Facilities Engineering Command Southwest Conract # N62473-08-D-8623 Delivery Order 09.

Naval Facilities Engineering Command Southwest (NAVFACSW). 2010b. Preliminary Final Environmental Assessment for the Development of Wind Energy Facilities on San Nicolas Island, Ventura County, California. Prepared for U.S. Department of the Navy, Naval Facilities Engineering Command Southwest, 1220 Pacific Highway, San Diego, California 92132-5190. Contract Number N62473-09-D-2602, Delivery Order 0003.

Naval Outlying Landing Field (NOLF) San Nicolas Island (SNI). 2006a. Naval Outlying Landing Field (NOLF) San Nicolas Island (SNI) Emergency Response Action Plan - The Red Plan.

Naval Outlying Landing Field (NOLF) San Nicolas Island (SNI). 2006b. Naval Outling Landing Field (NOLF) San Nicolas Island (SNI) Oil and Hazardous Substance Integrated Contingency Plan.

Parry, M. 1990. *Climate change and world agriculture.* Earthscan Publications Limited, London.

Regional Water Quality Control Board (RWQCB). 1994. Water Quality Control Plan, Los Angeles Region, Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties

Robilliard, G.A., Boehm, P.D., and M.J. Amman. 1997. Ephemeral Data Collection Guidance Manual, With Emphasis on Oil Spill NRDAS. In Proceedings from the 1997 International Oil Spill Conference p. 1029-1030.

State Water Resource Control Board (SWRCB). 2010. Water Words - Glossary and Definitions - A Compilation of Technical Water, Water Quality, Environmental, and Water Related Terms: Low Impact Development. <http://www.swrcb.ca.gov/publications_forms/available_documents/water_words/words_l.pdf>.

State Water Resources Control Board (SWRCB). 2004. Policy for Implementation and Enforcement of the Nonpoint Source Pollution Control Program.

Sustainable Sites Initiative (SSI). 2010. The Sustainable Sites Initiative. <http://www.sustainablesites.org/>. Accessed 12 August 2010.

Thatcher, T. 1990. Understanding interdependence in the natural environmental: some thoughts on cumulative impact assessment under the National Environmental Policy Act. *Environmental Law* 20(3):611-647.

Thom RM, DK Shreffler, and KB Macdonald. 1994. *Shoreline armoring effects on coastal ecology and biological resources in Puget Sound. Coastal Erosion Management Studies, Volume 7.* Shorelands and Coastal Zone Management Program, Washington Department of Ecology, Olympia, Washington.

U.S. Department of the Navy (USDON). 2005. Integrated Natural Resources Management Plan for San Nicolas Island, California, 2006-2010. 135 pp.

U.S. Department of the Navy Pacific Fleet (USDONPF). 2008. United States Navy Pacific Fleet Southern California Range Complex Environmental Impact Statement /Overseas Environmental Impact Statement.

U.S. Fish and Wildlife Service (USFWS). 2010. Biological Opinion for the San Nicolas Island Wind Energy Project, Ventura County, California (8-8-10-F-35).

U.S. Fish and Wildlife Service (USFWS). 2009a. Draft Post-Delisting Monitoring Plan for the Brown Pelican (*Pelecanus occidentalis*). U.S. Fish and Wildlife Service, Ventura Fish and Wildlife Office, Ventura, California. 19 pp.

U.S. Fish and Wildlife Service. 2007. Recovery Plan for the Pacific Coast Population of the Western Snowy Plover (*Charadrius alexandrinus nivosus*). In 2 volumes. Sacramento, California. xiv + 751 pages.

U.S. Fish and Wildlife Service (USFWS). 2005. Regional Seabird Conservation Plan Pacific Region.

U.S. Fish and Wildlife Service (USFWS). 2004. North American Waterfowl Management Plan.

U.S. Fish and Wildlife Service (USFWS). 2003a. Final Revised Recovery Plan for the Southern Sea Otter (*Enhydra lutris nereis*). Portland, Oregon. xi + 165 pp.

U.S. Fish and Wildlife Service (USFWS). 2003b. Service Interim Guidance on Avoiding and Minimizing Wildlife Impacts from Wind Turbines.

U.S. Fish and Wildlife Service (USFWS). 2001a. United States Shorebird Conservation Plan.

U.S. Fish and Wildlife Service (USFWS). 2001b. Biological Opinion (BO) for Activities on San Nicolas Island, California (1-8-01-F-14).

U.S. Fish and Wildlife Service (USFWS). 2000. Service guidance on the siting, construction, operation and decommissioning of communications towers. Division of Habitat Conservation and Division of Migratory Bird Management, Fish and Wildlife Service, Arlington, Virginia <http://migratorybirds.fws.gov/issues/towers/comtow.html>.

U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS). 1998. Endangered Species Consultation Handbook Procedures for Conducting Consultation and Conference Activities Under Section 7 of the Endangered Species Act, March 1998, Final.

7.6 Chapter 6

U.S. Department of the Navy (USDON). 2005b. Environmental Assessment for the Development of an Integrated Natural Resources Management Plan at San Nicolas Island, California.

U.S. Fish and Wildlife Service (USFWS). 2001. Biological Opinion for Activities on San Nicolas Island, California (5090 Ser 8G0000D/7284) (1-8-01-F-14).

U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS). 1998. Endangered Species Consultation Handbook, Procedures for Conducting Consultation and Conference Activities Under Section 7 of the Endangered Species Act.

7.7 Appendices

Bass, R.E. and A.I. Herson. 1993. Mastering NEPA: A Step-by-Step Approach. Point Arena, California: Solano Press Books.

California Coastal Commission (CCC). 2010. Public Resources Code, Division, 20, California Coastal Act - 2010. http://www.coastal.ca.gov/ccatc.html. Accessed 1 June 2010.

California Department of Fish and Game (CDFG). 2008. California Marine Life Protection Act - Master Plan for Marine Protected Areas - Revised Draft January 2008.

Goldfarb, W. 1984. Water Law. Butterworth Publishers, Boston. 233 p.

Harthill, M.P., D.M. Long, and B.D. Mishler. 1979. Preliminary List of Southern California Mosses. Bryologist 82(2).

Junak, S. 2008. A Flora of San Nicolas Island, California. Santa Barbara, CA: Santa Barbara Botanic Garden. 235 pp.

Merkel & Associates, Inc. (M&AI). 2007. Naval Base Ventura County, San Nicolas Island, Area of Special Biological Significance, Exception Application Package. Prepared for Division of Water Quality State Water Resources Control Board and Los Angeles Regional Water Quality Control Board.

Mishler, B.D. 1978. The mosses of the Channel Islands, California. Madrofio 21: 435-438.

National Invasive Species Council (NISC). 2008. National Invasive Species Management Plan 2008-2012.

National Oceanic and Atmospheric Administration (NOAA). 2007. News from NOAA - Marine Zones Now in Federal Waters of NOAA's Channel Islands National Marine Sanctuary, Marine Zoning Network Largest in Continental United States - August 9, 2007.

National Oceanic and Atmospheric Administration (NOAA) Fisheries. 2010. Marine Mammal Protection Act (MMPA) of 1972. http://www.nmfs.noaa.gov/pr/laws/mmpa/. Accessed 30 March 2010.

Natural Resources Conservation Service (NRCS). 2010. Watershed Protection and Flood Prevention. http://www.nrcs.usda.gov/programs/watershed/. Accessed 22 March 2010.

Naval Air Warfare Center Weapons Division (NAWCWD). 2002. Final Environmental Impact Statement/Overseas Environmental Impact Statement for Point Mugu Sea Range. Prepared by U.S. Department of the Navy, Naval Air Systems Command, Naval Air Warfare Center Weapons Division, Point Mugu, CA.

Pondella, D.J., B.E. Gintert, J.R. Cobb, and L.G. Allen. 2005. Biogeography of the nearshore rocky-reef fishes at the southern and Baja California islands. Journal of Biogeography. 32: 187-201.

Smith, G.G. 1993. Special Plants and Animals at Naval Air Weapons Station, Point Mugu, California. 117 pp.

Southern California Coastal Water Research Project (SCCWRP). 2008. Regional Monitoring Journal Articles, Annual Reports, and Technical Reports. Internet Website <http://www.sccwrp.org/view.php?action=quick_publications&id=95>.

State Water Resources Control Board (SWRCB). 2003. State Water Resources Control Board Marine State Water Quality Protection Areas - Areas of Special Biological Significance.

State Water Resources Control Board (SWRCB) and California Regional Water Quality Control Boards (RWQCB). 1970. SWRCB and California RWQCB's Administrative Procedures, September 24, 1970, Section XI, Miscellaneous (Rev. 7-9/1/1972), Designation of Areas of Special Biological Significance.

Tierra Data, Inc. (TDI). 2009. Vegetation Condition Evaluation Report, Outlying Landing Field, San Nicolas Island, San Nicolas Island, California. Prepared for: Naval Base Ventura County, San Nicolas Island Environmental Division.

U.S. Department of Defense (USDOD). 2008. Department of Defense Instruction Number 4715.16, Cultural Resources Management. 18 September 2008.

U.S. Department Defense (USDOD). 2006. Department of Defense Office of the Under Secretary of Defense Memorandum for Deputy Assistant Secretary of the Army (Environment, Safety, and Occupational Health), Deputy Assistant Secretary of the Navy (Environment), Deputy Assistant Secretary of the Air Force (Environment, Safety, and Occupational Health) and Director Defense Logistics Agency Regarding Integrated Natural Resources Management Plant (INRMP) Template, 14 August 2006.

U.S. Department of Defense (USDOD). 1996. Department of Defense Instruction Number 4715.3, Environmental Conservation Program. 03 May 1996.

U.S. Department of the Navy (USDON). 2007. Environmental and Natural Resources Program Manual (OPNAVINST 5090.1C). 30 October 2007.

U.S. Department of the Navy (USDON). 2006. Department of the Navy Office of the Chief of Naval Operations Integrated Natural Resources Management Plant Guidance for Navy Installations: How to Prepare, Implement, and Revise Integrated Natural Resource Management Plans (5090 N456K/6U838101 10 April 2006), April 2006.

U.S. Department of the Navy (USDON). 2005. Integrated Natural Resources Management Plan for San Nicolas Island, California, 2006-2010. 135 pp

U.S. Department of the Navy (USDON), Naval Facilities Engineering Command (NAVFAC). 2009. Naval Facilities Engineering Command Program Manual 73, Real Estate Procedural Manual. 10 April 2009.

U.S. Environmental Protection Agency (USEPA). 2010a. Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). http://www.epa.gov/agriculture/Ifra.html. Accessed 22 March 2010.

U.S. Environmental Protection Agency (USEPA). 2010b. History of the Clean Air Act. http://www.epa.gov/air/caa/caa_history.html. Accessed 22 March 2010.

U.S. Environmental Protection Agency (USEPA). 2010c. Summary of the Resource Conservation and Recovery Act. http://www.epa.gov/lawsregs/laws/rcra/html. Accessed 23 March 2010.

U.S. Environmental Protection Agency (USEPA). 2010d. Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). http://www.epa.gov/superfund/policy/cercla.html. Accessed 23 March 2010.

U.S. Fish and Wildlife Service (USFWS). 2010. Digest of Federal Resource Laws of Interest to the U.S. Fish and Wildlife Service - Oil Pollution Act. http://www.fws.gov/laws/lawsdigest/OILPOLL.html. Accessed 30 March 2010.

U.S. Fish and Wildlife Service (USFWS). 2010b. Digest of Federal Resource Laws of Interest to the U.S. Fish and Wildlife Service - Emergency Wetlands Resources Act of 1986. http://www.fws.gov/lawsdigest/emwet.html. Accessed 23 March 2010.

U.S. Fish and Wildlife Service (USFWS). 2010c. Digest of Federal Resource Laws of Interest to the U.S. Fish and Wildlife Service - North American Wetlands Conservation Act. http://www.fws.gov/laws.lawsdigest/nawcact.html. Accessed 23 March 2010.

U.S. Fish and Wildlife Service (USFWS). 2001. Biological Opinion for Activities on San Nicolas Island, California (5090 Ser 8G0000D/7284) (1-8-01-F-14).

U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS). 1998. Endangered Species Consultation Handbook, Procedures for Conducting Consultation and Conference Activities Under Section 7 of the Endangered Species Act.

Appendix A: Acronyms

Table A-1. Acronyms and abbreviations used in this Integrated Natural Resources Management Plan.

Acronym/Abbreviation	Definition
°C	degrees Celsius
°F	degrees Fahrenheit
ACP	Area Contigency Plan
ADUSD	Assistant Deputy Undersecretary of Defense
AICUZ	Air Installation Compatibility Use Zone
amsl	Above mean sea level
ANS	Aquatic Nuisance Species
APZ	Accident Prevention Zone
ASBS	Area of Special Biological Significance
ASR	Air Surveillance Radar
ATC	Air Traffic Control
BASH	Bird/Animal Aircraft Strike Hazard
BCC	Birds of Conservation Concern
BCG	Biological condition gradient
BEPA	Bald Eagle Protection Act
BLM	Bureau of Land Management
BMP	Best Management Practice
BO	Biological Opinion
BP	Before present
CAA	Clean Air Act
CAAA	Clean Air Act Amendments
CAE	Control Area Extensions
Cal-IPC	California Invasive Plant Council
CCA	Candidate Conservation Agreement
CCC	California Coastal Commission
CCN	category code number
CCNM	California Coastal National Monument
CDFG	California Department of Fish and Game
CDPR	California Department of Parks and Recreation
CE	Categorical exclusion
CEC	California Energy Commission
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CESA	California Endangered Species Act
CESU	Cooperative Ecosystem Studies Units
CFR	Code of Federal Regulations
CIESIN	Center for International Earth Science Information Network
CINMS	Channel Islands National Marine Sanctuary
CINP	Channel Islands National Park
CITES	Convention on International Trade in Endangered Species
cm	centimeter

Table A-1. Acronyms and abbreviations used in this Integrated Natural Resources Management Plan.

Acronym/Abbreviation	Definition
CMRC	California Mission Resource Center
CNEL	Community Noise Equivalent Level
CNI	Chief of Naval Installations
CNIC	Commander, Navy Installations Command
CNO	Chief of Naval Operation
CNPS	California Native Plant Society
CNRSW	Commander Navy Region Southwest
CO	Commanding Officer
COTP	Captain of the Port
CRANE	Cooperative Resource Assessment of Nearshore Ecosystems
CWA	Clean Water Act
CZARA	Coastal Zone Act Reauthorization Amendments
CZMA	Coastal Zone Management Act
DC	Direct Current
DIR	Directive
DRA	Defense Reauthorization Act
DUSD(I&E)	Deputy Under Secretary of Defense for Installations and the Environment
EA	Environmental Assessment
ED	Environmental Division
EEZ	Exclusive Economic Zone
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
EMR	Electromagnetic radiation
EMS	Environmental Management System
EO	Executive Order
EOD	Explosive Ordnance Disposal
EPA	Environmental Protection Agency
EPCRA	Emergency Planning and Community Right-to-Know Act
EPR	Environmental Program Requirements
ERL	Environmental Readiness Level
ESA	Endangered Species Act
ESOH	Environment, Safety and Occupational Health
ESQD	Explosive Safety Quantity Distance
FAA	Federal Aviation Authority
FEAD	Facility Engineering Acquisition Division
FEPCA	Federal Environmental Pesticide Control Act
FFD	Federal Fire Department
FGDC	Federal Geographic Data Committee
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FLEETEX	Fleet Exercise
FNWA	Federal Noxious Weed Act
FOCUS	Fiber Optics Communications Underwater System
FONSI	Finding of No Significant Impact
FOSC	Federal On-Scene Coordinator
FQPA	Federal Quality Protection Act
FR	Federal Register
FRP	Facility Response Plan
FTS	Flight termination system
FY	Fiscal Year
GIS	Geographic Information System
GPS	Global positioning system
GSG	Generalized stressor gradient
ha	hectare
HABS	Historic American Building Survey
HAER	Historic American Engineering Record

Table A-1. Acronyms and abbreviations used in this Integrated Natural Resources Management Plan.

Acronym/Abbreviation	Definition
HEA	Habitat Equivalency Analysis
HERO	Hazard of Electromagnetic Radiation of Ordnance
HERP	Hazard of Electromagnetic Radiation to Personnel
HSUS	Humane Society of the United States
HSWA	Hazardous and Solid Waste Amendments
IAFWA	International Association of Fish and Wildlife Agencies
ICP	Integrated Contingency Plan
ICRMP	Integrated Cultural Resources management Plan
ILS	Instrument Landing System
INRMP	Integrated Natural Resources Management Plan
IPL	Integrated Priority List
IPMP	Integrated Pest Management Plan
IRP	Installation Restoration Program
ISO	International Organization for Standardization
IVC	International Vegetation Classification
IWS	Institute for Wildlife Studies
Kg	Kilogram
km	kilometer
km2	square kilometer
kVA	Kilovolt-ampere
kW	Kilowatt
LARWQCB	Los Angeles Regional Water Quality Control Board
Lbs	Pounds
LCP	Local Coastal Plan
LEED	Leadership in Energy and Environmental Design
LID	Low Impact Development
LOA	Letter of Agreement
LRMP	Legacy Resource Management Program
LRPPA	Legacy Resource Protection Program Act
m	meter
MBTA	Migratory Bird Treaty Act
MFSO	Missile Flight Safety Officer
Mg/L	Milligram per litre
MHW	Mean high water mark
mi2	square mile
MILCON	Military Construction Project
MLLW	Mean lower low water
MLMA	Marine Life Management Act
MLPA	Marine Life Protection Act
MMPA	Marine Mammal Protection Act
MOU	Memorandum of Understanding
MPA	Marine Protected Area
mph	miles per hour
MRPP	Monitoring and Reporting Program Plan
MSRP	Montrose Settlements Restoration Program
MT	Metric tons
MTR	Marine Transportation-Related
MWR	Morale, Welfare, and Recreation
NAAQS	National Ambient Air Quality Standards
NABCI	U.S. North American Bird Conservation Initiative
NAE	Naval Aviation Enterprise
NAF	Nonappropriated funded
NALF	Naval Auxiliary Landing Field
NANCPA	Nonindigenous Aquatic Nuisance Prevention and Control Act
NAS	Naval Air Station

Table A-1. Acronyms and abbreviations used in this Integrated Natural Resources Management Plan.

Acronym/Abbreviation	Definition
NAVAIR	Naval Air Systems Command
NAVFAC	Naval Facilities Engineering Command
NAVFAC SW	Naval Facilities Engineering Command Southwest
NAWCWD	Naval Air Warfare Center Weapons Division
NBVC	Naval Base Ventura County
NBVCINST	Naval Base Ventura County Instruction
NCCP	Natural Community Conservation Plan
NCP	National Contingency Plan
NDAA	National Defense Authorization Act
NEPA	National Environmental Policy Act
NESHAP	National Emission Standards for Hazardous Air Pollutants
NEW	Net Explosive Weight
NGA	National Governors Association
NGO	Non-governmental organization
NHPA	National Historic Preservation Act
NHTSA	National Highway and Transportation Safety Administration
NISA	National Invasive Species Act
NISC	National Invasive Species Council
NISMP	National Invasive Species Monitoring Plan
nm	nautical mile
nm^2	square nautical mile
NMCI	Navy/Marine Corps Intranet
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Association
NOI	Notice of Intent
NOTAM	Notice to Airmen
NOTMAR	Notice to Mariners
NPDES	National Pollution Discharge Elimination System
NPL	National Priorities List (USEPA)
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRDA	Natural Resources Damage Assessment
NREL	National Renewable Energy Laboratory
NRHP	National Register of Historic Places
NRT	National Response Team
NSWDVO	Non-storm water discharge visual observations
NWS	National Weather Service
O&MN	Operations and Maintenance Navy
OEIS	Overseas Environmental Impact Statement
OIC	Officer-in-Charge
OPNAVINST	Naval Operations Instruction
OPPA	Oil Pollution Prevention Act
OSD	Office of the Secretary of Defense
OSHA	Occupational Safety and Health Administration
OSPR	Office of Oil Spill Prevention and Response
OUSD	Office of the Undersecretary of Defense
P2	Pollution prevention
PEO	Program Executive Officers
pers. comm.	*personal communication*
PFMC	Pacific Fishery Management Council
PIF	Partners-In-Flight
PISCO	Partnership for Interdisciplinary Studies of Coastal Oceans
PL	Public Law
PMSR	Point Mugu Sea Range
psig	pounds per square inch gauge

Table A-1. Acronyms and abbreviations used in this Integrated Natural Resources Management Plan.

Acronym/Abbreviation	Definition
PWD	Public Works Department
QRP	Qualified Recycling Program
RCD	Resource Conservation District
RCMP	Range Capabilities Master Plan
RCRA	Resource Conservation and Recovery Act
RDAT&E	Research Development Assessment Test and Evaluation
REA	Resource Equivalency Analysis
RO	Reverse osmosis
ROD	Record of Decision
RSA	Range Safety Approval
RSIP	Regional Shore Infrastructure Plan
RSOP	Range Safety Operational Plan
RWQCB	Regional Water Quality Control Board
SAIA	Sikes Act Improvement Act
SAP	Sustainability action plan
SARA	Superfund Amendments and Reauthorization Act
SAV	Submerged aquatic vegetation
SCA	Soil Conservation Act
SCB	Southern California Bight
SCCWRP	Southern California Coastal Water Research Project
SCI	San Clemente Island
SCUBA	Self Contained Underwater Breathing Apparatus
SECNAV	Secretary of the Navy
SMCA	State Marine Conservation Area
SMR	State Marine Reserve
SNI	San Nicolas Island
SOCAL	Southern California
SPCC	Spill Prevention Control and Countermeasure
SSI	Sustainable Sites Initiative
SWDVO	storm water discharge visual observations
SWFSC	Southwest Fisheries Science Center
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TALU	Tiered Aquatic Life Use
TMDL	Total Maximum Daily Load
TSS	Total suspended solid
UC	University of California
UFC	Unified Facilities Criteria
USACE	U.S. Army Corps of Engineers
USC	U.S. Code
USCG	United States Coast Guard
USDOC	U.S. Department of Commerce
USDOD	U.S. Department of Defense
USDODDIR	U.S. Department of Defense Directive
USDODINST	U.S. Department of Defense Instruction
USDOI	U.S. Department of the Interior
USDON	U.S. Department of the Navy
USFS	USDA Forest Service
USFWS	U.S. Fish and Wildlife Service
USGBC	U.S. Green Building Council
USNVC	U.S. National Vegetation Classification System
USSCS	U.S. Soil Conservation Service
V	volt
VegCAMP	California Vegetation Classification and Mapping Program
WAP	Wildlife Action Plan

Table A-1. Acronyms and abbreviations used in this Integrated Natural Resources Management Plan.

Acronym/Abbreviation	Definition
WBDG	Whole Building Design Guide
WFMP	Wildland Fire Management Plan
WG	Working Group
WPFPA	Watershed Protection and Flood Prevention Act
YCELP	Yale Center for Environmental Law and Policy
USDA	U.S. Department of Agriculture
CZMP	Coastal Zone Management Plan
CZMA	Coastal Zone Management Act
MBTRA	Migratory Bird Treaty Reform Act

Appendix B: Laws, Regulations, Instructions, and Directives

Descriptions of the most relevant federal, state, and local laws and regulations as well as EOs, USDODINSTs, and USDONINSTs and manuals are included in this Appendix in order to give an overview of the most influential laws, regulations, EOs, instructions, and manuals that can pertain to all types of projects occurring on SNI. Natural resources consultation requirements, including any current or planned consultations, consistency with ESA Recovery Plans, RWQCB Basin Plans, and with EFH permit and consultation processes are all discussed in this Appendix. The laws, regulations, instructions, and directives included in this Appendix are identified below in Table B-1.

Table B-1. Laws, Regulations, Instructions, and Directives .

Section	Topic
B.1	**Federal Laws**
B.1.1	**Federal Natural Resource Laws**
B.1.1.1	**Environmental Laws**
	Community Environmental Response Facilitation Act
	The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 as amended by the Superfund Amendments and Reauthorization Act of 1986
	Conservation Programs on Military Reservations
	Conservation and Rehabilitation Program on Military and Public Lands
	Federal Insecticide, Fungicide, and Rodenticide Act
	National Environmental Policy Act of 1969
	Noise Control Act
	Oil Pollution Prevention Act of 1990
	The Resource Conservation and Recovery Act of 1976 as amended by the Hazardous and Solid Waste Amendments of 1984
	Sikes Act (Fish and Wildlife Conservation and Military Reservations Act) of 1960 as amended by the Sikes Act Improvement Act of 1997
	The Sikes Act as Amended by PL 108-136, the National Defense Authorization Act of 2004
	Youth Conservation Corps Act
B.1.1.2	**Air Resource Laws**
	Clean Air Act as amended
B.1.1.3	**Water Resource Laws**
	Clean Water Act (Federal Water Pollution Control Act) of 1972 as amended
	Clean Water Act: Section 401 Water Quality Certification
	Clean Water Act: Section 404 Permits for Dredged or Fill Material and the Rivers and Harbors Act of 1899
	Federal Water Pollution Control Act Amendments
	Safe Drinking Water Act
B.1.1.4	**Soil Resource Laws**
	Soil Conservation Act
B.1.1.5	**Terrestrial and Aquatic Habitat Laws**
	Coastal Zone Management Act of 1972
	Emergency Wetlands Resources Act of 1986
	Federal Flood Disaster Prevention Act
	Land and Water Conservation Act of 1965
	Legacy Resource Protection Program Act
	North American Wetlands Conservation Act
	Watershed Protection and Flood Prevention Act
B.1.1.6	**Wildlife Population Laws**
	Animal Damage Control Act

Table B-1. Laws, Regulations, Instructions, and Directives (Continued).

Section	Topic
	Fish and Wildlife Conservation Act of 1980
	Fish and Wildlife Coordination Act of 1934
	Magnuson Stevens Fishery Conservation and Management Act, as amended
	Marine Mammal Protection Act of 1972
	Migratory Bird Treaty Act of 1918, as amended
	Migratory Bird Treaty Act as amended by the National Defense Authorization Act of 2003
B.1.1.7	**Species of Concern Laws**
	Bald Eagle Protection Act
	Endangered Species Act of 1973, as amended
	Federal Noxious Weed Act of 1974
	Noxious Plant Control Act
B.1.2	**Federal Cultural Resource Laws**
	American Antiquities Act of 1906
	American Indian Religious Freedom Act of 1978
	Archeological and Historic Preservation Act (Moss-Bennett Act) of 1974
	Archeological Resources Protection Act of 1979
	Historic Sites Act of 1935
	National Historic Preservation Act of 1966
	Native American Graves Protection and Repatriation Act of 1990
B.1.3	**Other Federal Laws**
	Americans with Disabilities Act of 1990
	Anti-Deficiency Act
	Data Quality Act
	Defense Appropriation Act
	Disabled Sportsman Access Act
	Emergency Planning and Community Right-to-Know Act
	Federal Facilities Compliance Act
	Military Construction and Authorization Act
	Military Construction Authorization Act - Leases; Non-excess property
	Military Construction Authorization Act - Military Reservation and Facilities-Hunting, Fishing and Trapping
	National Trails System Act
	Outdoor Recreation-Federal/State Program Act
B.2	**Executive Orders**
B.2.1	**Executive Orders Relevant to Natural Resources**
B.2.1.1	**Environmental Executive Orders**
	Federal Agency Recycling and the Council on Federal Agency Recycling and Procurement Policy (EO 12780)
	Federal Compliance with Pollution Control Standards (EO 12088)
	Federal Compliance with Right-to-Know Laws and Pollution Prevention Requirements (EO 12856)
	Greening the Government through Efficient Energy Management (EO 13123)
	Greening the Government through Leadership in Environmental Management (EO 13148)
	Greening the Government through Waste Prevention, Recycling, and Federal Acquisition (EO 13101)
	Protection and Enhancement of Environmental Quality (EO 11514 and EO 11991)
	Strengthening Federal Environmental, Energy, and Transportation Management (EO 13423)
B.2.1.2	**Terrestrial and Aquatic Habitat Executive Orders**
	Floodplain Management (EO 11988)
	Marine Protected Areas (EO 13158)
	Off-Road Vehicles on Public Lands (EO 11989)
	Protection of Wetlands (EO 11990)
B.2.1.3	**Wildlife Population Executive Orders**
	Migratory Birds (EO 13186)
B.2.1.4	**Species of Concern Executive Orders**
	Environmental Safeguard for Animal Damage Control on Federal Lands (EO 12342)
	Invasive Species (EO 13112)
B.2.1.5	**Executive Orders Relevant to Cultural Resources**
	Indian Sacred Sites (EO 13007)
	Protection and Enhancement of the Cultural Environment (EO 11593)
B.3	**Federal Regulations, Directives, and Instructions**
B.3.1	**Federal Regulations**
	10 CFR 436. Federal Energy Management and Planning Programs
	15 CFR 923. National Oceanic and Atmospheric Administration Coastal Zone Management Program Development and Approval Regulation
	15 CFR 930. Federal Consistency with Approved Coastal Management Programs
	15 CFR 990. NOAA Regulations on Natural Resources Damage Assessment
	18 CFR 1312. Archeological Resource Protection Act Regulations
	29 CFR 1910. Occupational Safety and Health Standards
	29 CFR 1910.1200. Hazard Communication Standard
	29 CFR 1910.120. Hazardous Waste and Emergency Response

Table B-1. Laws, Regulations, Instructions, and Directives (Continued).

Section	Topic
	32 CFR 172. Department of Defense Regulations for the Disposition of Proceeds from Sales of Surplus Property
	32 CFR 188. Environmental Effects in the U.S. of USDOD Actions
	32 CFR 190. Natural Resources Management Program
	32 CFR 229. Protection of Archeological Resources: Uniform Regulations
	32 CFR 650. Environmental Effects Abroad of Major Federal Actions - Environmental Protection and Enhancement: Subpart H, Historic Preservation
	32 CFR 775. Department of Navy Procedures for Implementing NEPA
	33 CFR 154. Oil Pollution Prevention Regulations for Marine Oil Transfer Facilities
	33 CFR 156. Coast Guard Regulations for Universal Waste Management Standards
	33 CFR 320-330. Regulatory Programs of the Corps of Engineers
	33 CFR 330. Dredge and Fill Nationwide Permit Program
	36 CFR 60. National Register of Historic Places
	36 CFR 63. Determination of Eligibility for Inclusion in the National Register of Historic Places
	36 CFR 65. National Historic Landmarks Program
	36 CFR 67. Historic Preservation Certificates
	36 CFR 68. The Secretary of Interior's Standards for Historic Preservation Projects
	36 CFR 78. Waiver of Federal Agency Responsibility under Section 110 of the National Historic Preservation Act
	36 CFR 79. Curation of Federally Owned and Administered Archaeological Collections
	36 CFR 800. National Historic Preservation Act Regulations for the Protection of Historic Properties
	40 CFR 6. EPA Regulations on Implementation of NEPA Procedures
	40 CFR 7. Archeological Resources Protection Act of 1979: Uniform Regulations
	40 CFR 50. EPA Regulations on National Primary and Secondary Ambient Air Quality Standards
	40 CFR 51-52. EPA Requirements for Preparation, Adoption, Submittal, Approval, and Promulgation of Implementation Plans
	40 CFR 53. EPA Regulations for Ambient Air Monitoring Reference and Equivalent Methods
	40 CFR 55. Outer Continental Shelf Air Regulations
	40 CFR 56. EPA Regulations on Regional Consistency under the Clean Air Act
	40 CFR 58. EPA Ambient Air Quality Surveillance Regulations
	40 CFR 60. EPA Regulations on New Source Performance Standards
	40 CFR 61. National Emissions Standards for Hazardous Air Pollutants
	40 CFR 62. EPA Regulations on state Plans for Designated Facilities and Pollutants
	40 CFR 65. EPA Regulations on Delayed Compliance Orders under the Clean Air Act
	40 CFR 66. EPA Regulations for Assessment and Collection of Noncompliance Penalties
	40 CFR 68. Chemical Accident Prevention Provisions
	40 CFR 69. EPA Special Exemptions from Requirements of the Clean Air Act
	40 CFR 70. State Operating Permit Programs
	40 CFR 80. Regulation of Fuels and Fuel Additives
	40 CFR 81. EPA Regulations Designating Areas for Air Quality Planning
	40 CFR 82. EPA Stratospheric Ozone Protection Regulations
	40 CFR 86. Control of Air Pollution from New and In-Use Motor Vehicle Engines: Certification and Test Procedures
	40 CFR 87. EPA Regulations on Control of Air Pollution and Aircraft and Aircraft Engines
	40 CFR 104. EPA Regulations on Public Hearings on Effluent Standards for Toxic Pollutants
	40 CFR 109. EPA Regulations on Criteria for state, Local, and Regional Oil Removal Contingency Plans
	40 CFR 110. EPA Regulations on Discharge of Oil
	40 CFR 112. EPA Regulations on Oil Pollution Prevention
	40 CFR 113. EPA Regulations on Liability for Small Onshore Oil Storage Facilities
	40 CFR 116-117. EPA Regulations on Hazardous Substances
	40 CFR 122. EPA National Pollutant Discharge Elimination System Permit Regulations
	40 CFR 125. EPA Regulations on Criteria and Standards for the National Pollutant Discharge Elimination System
	40 CFR 129. EPA Toxic Pollutant Effluent Standard
	40 CFR 130. EPA Requirements for Water Quality Planning and Management
	40 CFR 141-143. EPA National Drinking Water Regulations
	40 CFR 148. EPA Regulations on Hazardous Waste Disposal Restrictions for Class I Wells
	40 CFR 150-186. EPA Regulations for Pesticide Programs
	40 CFR 162. EPA Regulations on Insecticide, Fungicide, and Rodenticide Use
	40 CFR 220, 227. Ocean Dumping Regulations and Criteria
	40 CFR 230. Guidelines for Specification of Disposal Sites for Dredged or Fill Material
	40 CFR 231. EPA Regulations on Disposal Site Determination under the Clean Water Act
	40 CFR 240-241. EPA Guidelines for Thermal Processing of Solid Wastes and for the Land Disposal of Solid Wastes
	40 CFR 243. EPA Guidelines for Solid Waste Storage and Collection
	40 CFR 244. EPA Guidelines for Solid Waste Management of Beverage Containers
	40 CFR 245. EPA Guidelines for Resource Recovery Facilities
	40 CFR 246. EPA Guidelines for Source Separation for Materials Recovery
	40 CFR 247. EPA Guidelines for Procurement of Products that Contain Recycled Materials
	40 CFR 248. EPA Guidelines for Federal Procurement of Building Insulation Products Containing Recovered Materials
	40 CFR 249. EPA Guidelines for Federal Procurement of Cement and Concrete Containing Fly Ash

Table B-1. Laws, Regulations, Instructions, and Directives (Continued).

Section	Topic
	40 CFR 250. EPA Guidelines for Federal Procurement of Paper and Paper Products Containing Recovered Materials
	40 CFR 252. EPA Guidelines for Federal Procurement of Lubricating Oils Containing Re-refined Oil
	40 CFR 253. EPA Guidelines for Federal Procurement of Retread Tires
	40 CFR 255. EPA Guidelines for Identification of Regions and Agencies for Solid Waste Management
	40 CFR 257. EPA Regulations on Criteria for Classification of Solid Waste Disposal Facilities and Practices
	40 CFR 259. EPA Medical Waste Regulations
	40 CFR 260-270. EPA Regulations Implementing the Resource Conservation and Recovery Act
	40 CFR 262. EPA Regulations for Hazardous Waste Generators
	40 CFR 264. EPA Regulations for Owners and Operators of Permitted Hazardous Waste Facilities
	40 CFR 268. EPA Regulations on Land Disposal Restrictions
	40 CFR 273. EPA Regulations for Universal Waste Management Standards
	40 CFR 279. Used Oil Management Standards
	40 CFR 280. Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks
	40 CFR 300. National Oil and Hazardous Substance Pollution
	40 CFR 300.600. National Oil and Hazardous Substances Pollution Contingency Plan, Designation of Federal Trustees
	40 CFR 300.615. Responsibilities of Trustees
	40 CFR 302. EPA Designation, Reportable Quantities, and Notification Requirements for Hazardous Substances under CERCLA
	40 CFR 355. EPA Regulations for Emergency Planning and Notification under CERCLA
	40 CFR 370. EPA Hazardous Chemical Reporting and Community Right-to-Know Requirements
	40 CFR 372. EPA Toxic Chemical Release Reporting Regulations
	40 CFR 373. EPA Regulations for Real Property Transactions under CERCLA
	40 CFR 403. General Pretreatment Regulations for Existing and New Sources of Pollution
	40 CFR 413. EPA Effluent Guidelines and Standards for Electroplating
	40 CFR 414. EPA Effluent Guidelines and Standards for Organic Chemicals
	40 CFR 415. EPA Guidelines and Standards for Inorganic Chemicals
	40 CFR 417. EPA Effluent Guidelines and Standards for Soaps and Detergents
	40 CFR 433. EPA Effluent Guidelines and Standards for Metal Finishing
	40 CFR 504. State Sludge Management Programs Regulations
	40 CFR 760-761. EPA Regulations for Controlling Polychlorinated Biphenyls
	40 CFR 1500-1508. Council on Environmental Quality Regulations on Implementing NEPA Procedures
	41 CFR 41-47. Disposal Regulations
	43 CFR 3. Preservation of American Antiquities
	43 CFR 7. Archaeological Resources Protection Act of 1979; Uniform Regulations
	43 CFR 10. Native American Graves Protection and Repatriation Act Regulations
	43 CFR 11. USDOI Regulations on Natural Resource Damage Assessments
	49 CFR 100-199. Department of Transportation Hazardous Materials Regulations
	49 CFR 126. Pesticide Transportation
	49 CFR 194. Oil Pollution Prevention Regulations for Onshore Pipelines
	50 CFR 10. General Provision and Statutes Administered by the USFWS
	50 CFR 10.13 List of Migratory Birds
	50 CFR 18, 216, 218. Regulations Concerning Marine Mammals
	50 CFR 17.11 and 17.12 USFWS List of Endangered and Threatened Wildlife
	50 CFR 402. Interagency Cooperation - ESA of 1973 as amended
B.3.2	**Federal Register Documentation**
	74 FR 59443. Federal List of Endangered and Threatened Wildlife
B.3.3	**Department of the Interior Fish and Wildlife Service Memoranda**
	USFWS Memorandum to Regional Directors, Regions 1-8, Delegation of INRMP Concurrence Authority (12 June 2009)
B.3.4	**Department of Defense Instructions, Directives and Memorandums**
	USDODINST 4150.7. (29 May 08) USDOD Pest Management Program
	USDODINST 4700.4. (24 January 89) Natural Resources Management Program
	USDODINST 4715.3. (03 May 96) Natural Resources Management
	USDODINST 4715.4. (18 June 96) Pollution Prevention
	USDODINST 4715.9. (03 May 96) Environmental Planning and Analysis
	USDODINST 4715.16. (18 September 08) Cultural Resources Management
	USDODINST 6055.6. (10 October 00) USDOD Fire and Emergency Services Program
	USDODINST 5000.13. (13 December 76) Natural Resources: The Secretary of Defense Natural Resources Conservation Award
	USDODDIR 4001.1.(04 September 86) Installation Management
	USDODDIR 4140.1. (04 January 93) Material Management Policy
	USDODDIR 4150.7. (22 April 96) USDOD Pest Management Programs
	USDODDIR 4165.57. (08 November 77) Air Installation Compatible Use Zones
	USDODDIR 4165.59. (29 December 75) USDOD Implementation of the Coastal Zone Management Act
	USDODDIR 4165.60. (27 July 89) Hazardous Material Pollution

Table B-1. Laws, Regulations, Instructions, and Directives (Continued).

Section	Topic
	USDODDIR 4165.60. (04 October 76) Solid Waste Management - Collection, Disposal, Resource Recovery, and Recycling Program
	USDODDIR 4165.61. (09 August 93) Intergovernmental Coordination of USDOD Federal Development Programs and Activities
	USDODDIR 4700.1. Natural Resources Conservation and Management
	USDODDIR 4700.2. (15 July 88) Secretary of Defense Award for Natural Resources and Environmental Management
	USDODDIR 4700.4. (24 January 89) Natural Resources Management Program
	USDODDIR 4705.1. (09 July 92) Management of Land-based Water Resources in Support of Joint Contingency Operations
	USDODDIR 4710.1 (21 June 84) Archeological and Historic Resources Management
	USDODDIR 4715.DD-R (April 96) Draft Integrated Natural Resources Management in USDOD
	USDODDIR 4715.1. (24 February 96) Environmental Security
	USDODDIR 4715.2. (03 May 96) USDOD Regional Environmental Coordination
	USDODDIR 4715.3. (03 May 96) Environmental Conservation Program
	USDODDIR 4715.4. (18 June 96) Pollution Prevention
	USDODDIR 4715.5. (22 April 96) Management of Environmental Compliance at Overseas Installations
	USDODDIR 4715.6. (24 April 96) Environmental Compliance
	USDODDIR 4715.7. (22 April 96) Environmental Restoration Program
	USDODDIR 4715.8. (02 February 98) Environmental Education Training and Career Development
	USDODDIR 4715.9. (03 May 96) Environmental Planning and Analysis
	USDODDIR 4715.10. (24 April 96) Environmental Education Training and Career Development
	USDODDIR 4715.11. (24 April 07) Environmental and Explosive Safety Management on Operational Ranges within the United States
	USDODDIR 4715.12. (19 August 99) Environmental and Explosive Safety Management on USDOD Active and Inactive Ranges Outside the United States
	USDODDIR 5030.41. (01 June 77) Oil and Hazardous Substances Pollution Prevention and Contingency Program
	USDODDIR 6050.1. (30 July 79) Environmental Effects in the US of USDOD Actions
	USDODDIR 6050.2. (19 April 79) Use of Off-Road Vehicles on USDOD Lands
	USDODDIR 6050.4. (16 March 82) Marine Sanitation Devices for Vessels Owned or Operated by USDOD
	USDODDIR 6050.5. (29 October 90) USDOD Hazard Communication Program
	USDODDIR 6050.7. (31 March 79) Environmental Effects Abroad of Major USDOD Actions
	USDODDIR 6050.8. (27 February 86) Storage and Disposal of Non-USDOD Owned Hazardous or Toxic Materials on USDOD Installations
	USDODDIR 6050.10 (20 September 91) USDOD Policy for Establishing and Implementing Environmental Standards at Overseas Installations
	USDODDIR 6050.15 (14 June 85) Prevention of Oil Pollution from Ships Owned or Operated by USDOD
	USDODDIR 6050.16. (20 September 91) USDOD Policy for Establishing and Implementing Environmental Standards at Overseas Installations
	USDODDIR 7000.14-R (18 March 93) USDOD Financial Management Regulations
	Deputy Under Secretary of Defense (Installations and Environment) Memorandum, 10 October 2002
	Assistant Deputy Undersecretary of Defense (ADUSD) for Environment, Safety and Occupational Health (ESOH) Policy (01 November 2004 Memo)
	Office of the Under Secretary of Defense Memorandum for Deputy Assistant Secretary of the Army (Environment, Safety and Occupational Health), Deputy Assistant Secretary of the Navy (Environment), Deputy Assistant Secretary of the Air Force (Environment, Safety, and Occupational Health), Director Defense Logistics Agency. Implementation of Sikes Act Improvement Amendments: Supplemental Guidance concerning Leased Lands. 17 May 2005
	Office of the Under Secretary of Defense Memorandum for Deputy Assistant Secretary of the Army (Environment, Safety and Occupational Health), Deputy Assistant Secretary of the Navy (Environment), Deputy Assistant Secretary of the Air Force (Environment, Safety, and Occupational Health), Director Defense Logistics Agency. Integrated Natural Resource Management Plan (INRMP) Template. 14 August 2006
	Memorandum of Understanding Among The U.S. Department of Defense and The U.S. Fish and Wildlife Service and The International Association of Fish and Wildlife Agencies for a Cooperative Integrated Natural Resource Management Program on Military Installations. 31 January 2006
	Memorandum of Understanding to Promote the Conservation of Migratory Birds between the U.S. Fish and Wildlife Service and the U.S. Department of Defense in Accordance with Executive Order 13186. Prepared by the Under Secretary of Defense for Acquisition, Technology, and Logistics in April 2007.
B.3.5	**Department of the Navy Manuals, Instructions, and Guidance**
	SECNAVINST 4000.35. (17 August 92) (NOTAL) Department of the Navy Cultural Resources Program
	SECNAVINST 5090.8 (18 December 00) (ASN(I&E)) Policy for Environmental Protection, Natural Resources, and Cultural Resources Program
	SECNAVINST 6240.6E. (18 December 00) Implementation of USDOD Directives under USDODINST 4700.4
	SECNAVINST 6401-1A. (16 August 94) Veterinary Health Services
	OPNAVINST 5090.1C. (30 October 07) Environmental Readiness Program Manual
	OPNAVINST 5750.13. (10 November 75) Historical Properties of the Navy
	OPNAVINST 6250.4B. (27 August 98) Pest Management Programs
	OPNAVINST 8000.16. Environmental Security Management
	OPNAVINST 8026.2A (15 June 00) Navy Munitions Disposition Policy

Table B-1. Laws, Regulations, Instructions, and Directives (Continued).

Section	Topic
	OPNAVINST 11000.17. (17 September 99) National Preservation Act Consultations Related to Base Realignment and Closure Actions
	OPNAVINST 11010.20F. (07 June 96) Facilities Projects Manual
	NAVFAC P-73. (May 87) Real Estate Procedural Manual, Volumes I and II; and Natural Resources Management Procedural Manual, Chapter 2 - Integrated Natural Resources Management Plans
	NAVFACINST 6250.3H. Applied Biology Program Services and Training
	NAVFACINST 11010.45. (30 June 02) Comprehensive Regional Planning Instruction (Land Use Module/RSIP Links)
	NAVFACINST 11012.111A. Land Use Conservation Planning
	NAVFACINST MO-100.4. Guidance on Special Interest Areas
	Office of the Assistant Secretary (Installations and Environment) Memorandum for Commander Navy Installations Command (N45), Director Environmental Readiness Division (N45), Director Facilities and Services Division (CMC-LFL). Department of the Navy Natural Resources Program Metrics. 22 August 2006
	Chief of Naval Operations (N45) Integrated Natural Resources Management Program (INRMP) Guidance 10 April 2006 (5090 N456K/6U838101)
	Chief of Naval Operations (N45) Policy Letter Preventing Feral Cat and Dog Populations on Navy Property 10 January 2002 (5090 Ser N456M/1U595820)
	Chief of Naval Operations (N45) Navy Environmental Management System (EMS) Policy 06 December 2001 (5090 Ser N451G/1U595831)
B.3.6	**Naval Base Ventura County Instructions**
	Naval Base Ventura County Instruction 11010.1 Site Approval and Project Review Process
B.4	**California State Laws**
B.4.1	**Water Resource Laws**
	California Water Code
	Porter-Cologne Water Quality Control Act
B.4.2	**Terrestrial and Aquatic Habitat Laws**
	California Coastal Act and the Federal CZMA
	California Ocean Protection Act.
	California Marine Life Protection Act
	Channel Islands Marine Protected Areas
	Marine Managed Areas Improvement Act
B.4.3	**Wildlife Population Laws**
	Marine Life Management Act (MLMA)
	Marine Resources Protection Act of 1990
B.4.4	**Species of Concern Laws**
	California Endangered Species Act
B.5	**State Regulations**
	Fish and Game Code and Stream Alteration Controls
	Fish and Game Code and Title 14 California Code of Regulations
B.6	**Local Government**

This Appendix is structured to focus on federal laws first and state laws second. Furthermore, the section on Federal Laws is further segregated into subsections that focus on cultural resources and specific natural resource topics including the environment in general, air resource, water resource, soil resource, terrestrial and aquatic habitats, wildlife populations, and species of concern. These natural resource topics correspond to the natural resource management sections contained within Sections 3 and 4 of the SNI INRMP.

B.1 Federal Laws

B.1.1 Federal Natural Resource Laws

B.1.1.1 Environmental Laws

Community Environmental Response Facilitation Act

The Community Environmental Response Facilitation Act (42 USC § 9601 note, 9620) amends CERCLA Section 120 (h) to allow expedition of reuse and redevelopment of federal facilities being closed. It was expanded to include federal agency requirements pertaining to the disposal of real property.

The Comprehensive Environmental Response, Compensation, and Liability Act of 1980, PL 96-510 (26 USC §§ 9601-9675) as amended by the Superfund Amendments and Reauthorization Act of 1986, PL 99-499 (100 Stat. 1613)

The CERCLA of 1980 (43 USC §§ 9601 *et seq.*), commonly known as Superfund, was enacted by Congress on 11 December 1980 (USEPA 2010d). This Act establishes programs for the cleanup of hazardous waste disposal and spill sites to ensure protection of human health and the environment. The Act designates the President as trustee for federally protected or managed natural resources. This law also created a tax on the chemical and petroleum industries and provided broad federal authority to respond directly to releases or threatened releases of hazardous substances that may endanger public health or the environment. Over five years, $1.6 billion was collected and the tax went to a trust fund for cleaning up abandoned or uncontrolled hazardous waste sites (USEPA 2010d). CERCLA:

- Established prohibitions and requirements concerning closed and abandoned hazardous waste sites;
- Provided for liability of persons responsible for releases of hazardous waste at these sites; and
- Established a trust fund to provide for cleanup when no responsible party could be identified.

The law authorizes two kinds of response actions:

- Short-term removals, where actions may be taken to address releases or threatened releases requiring prompt response; and
- Long-term remedial response actions that permanently and significantly reduce the dangers associated with releases or threats of releases of hazardous substances that are serious, but not immediately life threatening. These actions can be conducted only at sites listed on EPA's National Priorities List (NPL).

CERCLA also enabled the revision of the NCP. The NCP provided the guidelines and procedures needed to respond to releases and threatened releases of hazardous substances, pollutants, or contaminants. The NCP also established the NPL (USEPA 2010d).

CERCLA was amended by the Superfund Amendments and Reauthorization Act (SARA) on 17 October 1986 (USEPA 2010d).

Conservation Programs on Military Reservations

The Conservation Programs on Military Reservations (PL 90-465; 16 USC §§ 670 *et seq.*) amends PL 86-797 to include outdoor recreation programs on military lands.

Conservation and Rehabilitation Program on Military and Public Lands

The Conservation and Rehabilitation Program on Military and Public Lands (PL 93-452; 16 USC §§ 670 *et seq.*) amends PL 86-797 by providing for fish and wildlife habitat improvements, range rehabilitation, and control of off-road vehicles on federal lands.

Federal Insecticide, Fungicide, and Rodenticide Act, PL 92-516, as amended (7 USC §§ 136-136y)

The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) governs the use and application of pesticides in natural resource management programs. When the FIFRA was first passed in 1947, it established procedures for registering pesticides with the U.S. Department of Agriculture (USDA) and established labeling provisions (USEPA 2010a). The law was still primarily concerned with the efficacy of pesticides and did not regulate pesticide use.

FIFRA was essentially rewritten in 1972 when it was amended by the Federal Environmental Pesticide Control Act (FEPCA) (USEPA 2010d). The law has been amended numerous times since 1972, including some significant amendments in the form of the Food Quality Protection Act (FQPA) of 1996. In its current form, FIFRA mandates that EPA regulate the use and sale of pesticides to protect human health and preserve the environment (USEPA 2010a).

Since the FEPCA amendments, EPA is specifically authorized to: (1) strengthen the registration process by shifting the burden of proof to the chemical manufacturer, (2) enforce compliance against banned and unregistered products, and (3) promulgate the regulatory framework missing from the original law (USEPA 2010a).

FIFRA provides EPA with the authority to oversee the sale and use of pesticides. However, because FIFRA does not fully preempt state/tribal or local law, each state/tribe and local government may also regulate pesticide use (USEPA 2010a).

National Environmental Policy Act of 1969, PL 91-190 (42 USC 4321-4370d)

The NEPA (PL 91-190; 42 USC §§ 4321 *et seq.*) was signed on 01 January 1970, and became the basic national policy for protection of the environment. Its passage was driven by the broadly felt sentiment that federal agencies should lead the nation in environmental protection. It established a systematic, interdisciplinary framework for agencies to prevent environmental damage, and contains "action-forcing" procedures to ensure that environmental factors are taken into account on major decisions, and to document those decisions. There are four stated purposes of NEPA (42 USC § 4321):

- Declare a national policy which will encourage productive and enjoyable harmony between people and the environment.
- Promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate health and welfare.
- Enrich the understanding of the ecological system and natural resources important to the nation.
- Establish a Council on Environmental Quality (CEQ).

Activities directly undertaken by, financed by, or requiring approval of federal agencies are subject to NEPA environmental review processes, with only certain specified exceptions. NEPA is implemented by CEQ regulations (40 CFR § 1500-1508). The most important function of agency compliance with NEPA procedure is to fully disclose and consider environmental information in decision making and to inform the public of potential impacts and alternatives. However, if adverse environmental effects of a proposed action are identified and disclosed to the public, the agency may decide that other factors outweigh environmental impacts and continue with the action.

NEPA has three decisional mechanisms. A proposed federal agency action is first reviewed to see if it can qualify for a categorical exclusion (usually small, routine projects with no potential significant environmental effect; categories are identified in agency NEPA policies) or other exemption to the process. If not, then an EA or EIS is prepared. If an EA is prepared and it concludes that adverse environmental impacts will be insignificant, then the agency can file a FONSI, followed by implementing its preferred alternative. If the proposed project has the potential to "significantly affect the quality of the human environment," then the EIS process must be followed. Briefly, these steps are: NOI, scoping process, Draft EIS, Agency/Public Review and Comment, Final EIS, ROD, and Agency Action.

Project mitigation is usually used as a means to address adverse environmental impacts through the federal (NEPA) process. However, NEPA establishes no mitigation requirement for adverse environmental impacts. "A solution to an environmental problem" is a simple definition of a mitigation measure (Bass and Herson 1993). To be adequate and effective, mitigation measures should fit in one of five categories defined by the CEQ as:

1. **Avoiding** the impact by not taking a certain action or parts of an action.
2. **Minimizing** the impact by limiting the degree or magnitude of the action and its implementation.
3. **Rectifying** the impact by repairing, rehabilitating, or restoring the affected environment.
4. **Reducing** or eliminating the impact over time by preservation and maintenance during the life of the action.
5. **Compensating** for the impact by replacing or providing substitute resources or environments.

An EIS must identify all relevant, reasonable mitigation measures that could lessen impacts to the human environment. However, a federal agency does not have to adopt mitigation measures included in an EIS unless agency-specific NEPA procedures require adoption of mitigation measures or the agency commits to implementing mitigation measures in the ROD.

For USDON projects, USDOD has issued policies and procedures, including a supplement providing policy and assigning responsibilities adopted by USDON (32 CFR § 775). These U.S. Navy procedures meet the NEPA requirement that every federal agency adopt procedures to supplement CEQ regulations. Following the U.S. Navy directive, specific policy for compliance with procedural requirements was issued under OPNAVINST 5090.1C. This document tasks each Naval installation with ensuring that U.S. Navy actions are in accordance with NEPA.

Naval Base Ventura County Instruction (NBVCINST) 11010.1 establishes responsibilities, policies, and procedures associated with obtaining project and site approvals from the PWD. This instruction provides a standard project review process that ensures NEPA and OPNAVINST 5090.1C compliance. The NBVC Project Review Board reviews all new activities occurring on SNI and assesses any resource impacts, permits required, and endangered species considerations that may affect the implementation of a proposed project.

NEPA compliance for INRMPs is specifically addressed by the CNO guidance (CNO Letter 5090 Ser N456F/8U589129 of 30 November 1998). The guidance is intended to be consistent with a SECNAV memorandum (12 August 1998), which stated:

"All projects essential to fulfill the selected alternative (mix of management objectives) must be implemented within a time frame indicated in the INRMP. Any deviation or change from achieving the selected alternative may require supplementation to the EA or EIS and an opportunity for public comment. An installation may add or modify projects for achieving the selected alternative without additional review under NEPA if the projects are consistent with the existing NEPA analysis."

The CNO letter provided the following guidelines:

- The EA for an INRMP should be a separate document, but a case-by-case decision may be made.
- The INRMP and NEPA process should occur concurrently, and an integrated schedule was suggested in which the EA is expected to be 75 percent complete when the INRMP is ready for public comment, and 90 percent complete when letters of concurrence are requested from stakeholders.
- A FONSI is required before an INRMP may be signed.

Table B-2 lists the actions that under normal conditions are categorically excluded from further documentation requirements under NEPA.

Noise Control Act

The Noise Control Act of 1972 (42 USC § 4901 *et seq.*) (as mended by the Quiet Communities Act) authorizes establishment of federal noise emission standards for products distributed in commerce and coordinates federal research efforts in noise control.

Oil Pollution Prevention Act of 1990, PL 101-380 (33 USC 2701 *et seq.*)

The Oil Pollution Prevention Act established new requirements and extensively amended the Federal Water Pollution Control Act (33 USC §§ 2701 *et seq.*) to provide enhanced capabilities for oil spill response and natural resource damage assessment by the USFWS. The act provides that the NCP include planning, rescue, and minimization of damage to fish and wildlife in responding to oil pollution. It requires USFWS consultation on developing a fish and wildlife response plan for the NCP, input to ACPs, review of Facility and Tank Vessel Contingency Plans, and conducting damage assessments associated with oil spills. One aspect of particular interest to the USFWS involves the identification of ecologically sensitive areas and the preparation of scientific monitoring and evaluation plans. Research conducted by the USFWS is to be directed and coordinated by the National Wetland Research Center (USFWS 2010).

Table B-2. List of categorical exclusions from further documentation requirements under the National Environmental Policy Act per OPNAVINST 5090.1C.

Categorical Exclusion
a. Routine personnel, fiscal, and administrative activities involving military and civilian personnel (i.e. recruiting, processing, paying, and records keeping).
b. Reductions in force wherein impacts are limited to socioeconomic factors.
c. Routine movement of mobile assets, such as ships and aircraft, in home port reassignments (when no new support facilities are required) to perform as operational groups, and/or for repair and overhaul.
d. Relocation of personnel into existing federally owned or commercially leased space that does not involve a substantial change in the supporting infrastructure (an increase in vehicular traffic beyond the capacity of the supporting road network. To accommodate such an increase is an example of substantial change).
e. Studies, data, and information gathering that involve no physical change to the environment (i.e. topographic surveys, bird counts, wetland mapping, forest inventories, and timber cruising).
f. Routine repair and maintenance of facilities and equipment to maintain existing operations and activities, including maintenance of improved and semi-improved grounds such as landscaping, lawn care, and minor erosion control measures.
g. Alteration and additions of existing structures to conform to or provide conforming use specifically required by new or existing applicable legislation or regulations (i.e. hush houses for aircraft engines and scrubbers for air emissions).
h. Routine actions normally conducted to operate, protect, and maintain military-owned and/or controlled properties (i.e. maintaining law and order; physical plant protection by military police and security personnel; and localized pest management activities on improved and semi-improved lands conducted under applicable federal and state directives).
i. New construction that is consistent with existing land use and, when completed, the use or operation of which complies with existing regulatory requirements (i.e. a building on a parking lot with associated discharges/runoff that are within existing handling capacities; a bus stop along a roadway; and a foundation pad for portable buildings within a building complex).
j. Procurement activities that provide goods and support for routine operations.
k. Day-to-day personnel resource management and research activities under approved plans and inter-agency agreements and designed to improve and/or upgrade military ability to manage those resources.
l. Decisions to close facilities, decommission equipment, and/or temporarily discontinue use of facilities or equipment (where such equipment is not used to prevent/control environmental impacts). (Note: Does not apply to permanent closure of public roads or to base closures.)
m. Contracts for activities conducted at established laboratories and plants, to include contractor-operated laboratories and plants, within facilities where all airborne emissions, waterborne effluent, external radiation levels, outdoor noise, and solid and bulk waste disposal practices comply with existing applicable federal, state, and local laws and regulations.
n. Routine movement, handling and distribution of materials, including hazardous materials and wastes that when moved, handled, or distributed are under applicable regulations.
o. Demolition, disposal, or improvements involving buildings or structures neither on nor eligible for listing on the National Register of Historic Places and when under applicable regulations (i.e. removal of asbestos, polychlorinated biphenyls (PCBs), and other hazardous materials).
p. Acquisition, installation, and operation of utility and communication systems, data processing cable and similar electronic equipment, which use existing rights of way, easements, distribution systems, and/or facilities.
q. Renewals and/or initial real estate ingrants and outgrants involving existing facilities and land wherein use does not change significantly. This includes, but is not limited to, existing or federally-owned or privately-owned housing, office, storage, warehouse, laboratory, and other special purpose space.
r. Grants of license, easement, or similar arrangements for the use of existing rights-of-way or incidental easements complementing the use of existing rights-of-way for use by vehicles (not to include significant increase in vehicle loading); electrical, telephone, and other transmission and communication lines; water, wastewater, storm water, and irrigation pipelines, pumping stations, and facilities, and for similar utility and transportation uses.
s. Transfer of real property from the military to another military department or to another federal agency, and the granting of leases (including leases granted under the agricultural out leasing program where soil conservation plans are incorporated), permits and easements where there is no substantial change in land use or where subsequent land use would otherwise be categorically excluded.
t. Disposal of excess easement interests to the underlying fee owner.
u. Renewals and minor amendments of existing real estate grants for use of government-owned real property with no anticipated significant change in land use.
v. Pre-lease exploration activities for oil, gas or geothermal reserves (e.g. geophysical surveys).
w. Return of public domain lands to the Department of the Interior.
x. Land withdrawal continuances or extensions, that merely establish times, and where there is no significant change in land use.
y. Temporary closure of public access to military property to protect human or animal life.
z. Engineering effort undertaken to define the elements of a proposal or alternatives sufficiently to assess the environmental effects.
aa. Actions, which require the concurrence or approval of another federal agency, where the action is a categorical exclusion of the other federal agency.
bb. Maintenance dredging and debris disposal requiring no new depths, securing of applicable permits, and disposal at an approved disposal site.
cc. Installation of devices to protect human or animal life (i.e. raptor electrocution prevention devices, fencing to restrict wildlife movement onto airfields, and fencing and grating to prevent accidental entry to hazardous areas).
dd. Natural resources management actions undertaken or permitted under agreement with or subject to regulation by federal, state, or local organizations having management responsibility and authority over the natural resources in question, including hunting or fishing during hunting or fishing seasons established by state authorities under their state fish and game management laws. Concerning natural resources regulated by another federal agency, the responsible command may cooperate in any environmental analysis that may be required by the other agency's regulations.
ee. Approval of recreational activities that do not involve significant physical alteration of the environment or increase human disturbance in sensitive natural habitats and that do not occur in or next to areas inhabited by endangered or threatened species.
ff. Routine maintenance of timber stands, including issuance of down-wood firewood permits, hazardous tree removal, and sanitation salvage.
gg. Reintroduction of endemic or native species (other than endangered or threatened species) into their historical habitat when no substantial site preparation is involved.

The Resource Conservation and Recovery Act of 1976, PL 94-580 (42 USC §§ 6901-6992k) as amended by the Hazardous and Solid Waste Amendments of 1984, PL 98-616

The RCRA (42 USC §§ 692 *et seq.*) gives the EPA the authority to control hazardous waste from the "cradle-to-grave" and establishes a comprehensive program which manages solid and hazardous waste (USEPA 2010c). This includes the generation, transportation, treatment, storage, and disposal of hazardous waste. Subtitle C, Hazardous Waste Management, sets up a framework for managing hazardous waste from its initial generation to its final disposal. Waste pesticides and equipment/containers contaminated by pesticides are included under hazardous waste management requirements.

The RCRA also set forth a framework for the management of non-hazardous solid wastes. The 1986 amendments to RCRA enabled EPA to address environmental problems that could result from underground tanks storing petroleum and other hazardous substances (USEPA 2010c).

The federal Hazardous and Solid Waste Amendments (HSWA) are the 1984 amendments to RCRA that focused on waste minimization and phasing out land disposal of hazardous waste as well as corrective action for releases. Some of the other mandates of this law include increased enforcement authority for EPA, more stringent hazardous waste management standards, and a comprehensive underground storage tank program (USEPA 2010c).

Sikes Act (Fish and Wildlife Conservation and Military Reservations Act) of 1960, PL 86-797as amended by Sikes Act Improvement Act (SAIA) of 1997, PL 93-452 (16 USC §§ 670-670f)

Under the Fish and Wildlife Conservation and Military Reservations Act of 1960, commonly known as the Sikes Act (PL 86-797) as amended by the SAIA of 1997 (PL 105-85 (codified at 16 USC § 670 – 670f [1999]), the Secretary of Defense shall carry out a program for conserving and rehabilitating natural resources on military installations. To facilitate the program, the Secretary of each military department shall prepare and implement an INRMP for each military installation in the U.S. under the jurisdiction of the Secretary. These plans must be consistent with the use of military installations to ensure the preparedness of the Armed Forces.

The Secretaries of the military departments shall carry out the program to provide for the following:

- Conservation and rehabilitation of natural resources on military installations;
- Sustainable multipurpose use of the resources, which shall include hunting, fishing, trapping, and non consumptive uses, subject to safety requirements and military security; and
- Public access to military installations to use natural resources.

The Sikes Act requires Navy facilities to manage their natural resources so as to provide multiple uses and public access, to the extent that the military mission is not jeopardized. The act provides a mechanism whereby USDOD and USDOI and the states cooperate to manage fish and wildlife on military installations.

Personnel charged with natural resources management are to be professionally trained in their fields of responsibility. Section 101 of the Sikes Act authorizes planning programs for developing, maintaining, and coordinating natural resources programs on each military reservation. In compliance with 16 USC § 670a(b), to the extent appropriate and applicable, the INRMP provides for the following:

- Fish and wildlife management, land management, forest management, and fish and wildlife-oriented recreation;
- Fish and wildlife habitat enhancement or modifications;
- Wetlands protection and enhancement where necessary for support of fish, wildlife, and plants;
- Integration of and consistency among the various activities conducted under the plan;

- Establishment of specific natural resource management goals and objectives and time frames for proposed actions;
- Sustainable public use of natural resources to the extent that the use is consistent with the needs of fish and wildlife resources;
- Public access to SNI that is necessary and appropriate for the use described above, subject to the requirements necessary to ensure public safety and military security;
- Enforcement of applicable natural resource laws and regulations;
- No net loss in the capability of SNI to support the military mission; and
- Such other activities as SECNAV determines appropriate.

The Sikes Act as Amended by Public Law 108-136, The National Defense Authorization Act of 2004

The NDAA for FY 2004 changed the ESA regarding INRMPs, which were justified on the basis of the need to promote military readiness while protecting listed species. Under new Section 4(a)(3)(B)(i) of the ESA, the Secretary of the Interior or the Secretary of Commerce, as appropriate, is precluded from designating critical habitat on any areas owned, controlled, or designated for use by USDOD where an INRMP has been developed that, as determined by the Interior or Commerce Secretary, provides a benefit to the species for which critical habitat designation is proposed.

Youth Conservation Corps Act

The Youth Conservation Corps Act of 1972, as amended (PL93-408 as amended; 16 USC § 1701) expands and makes permanent a Youth Conservation Corps program and establishes objectives for youth employment and conservation work on public lands.

B.1.1.2 Air Resource Laws

Clean Air Act, as amended (42 USC §§ 7401 *et seq.*)

The CAA as amended regulates air emissions from area, stationary, and mobile sources. This law authorizes the EPA to establish National Ambient Air Quality Standards (NAAQS) to protect public health and the environment.

The legal authority for federal programs regarding air pollution control is based on the 1990 Clean Air Act Amendments (CAAA). The 1990 CAAA substantially increased the authority and responsibility of the federal government (USEPA 2010b). New regulatory programs were authorized for control of acid deposition (acid rain) and for the issuance of stationary source operating permits. The National Emission Standards for Hazardous Air Pollutants (NESHAPs) were incorporated into a greatly expanded program for controlling toxic air pollutants. The provisions for attainment and maintenance of NAAQS were substantially modified and expanded. Other revisions included provisions regarding stratospheric ozone protection, increased enforcement authority, and expanded research programs (USEPA 2010b). These are the latest in a series of amendments made to the CAA. This legislation modified and extended federal legal authority provided by the earlier Clean Air Acts of 1963 and 1970 (USEPA 2010b).

B.1.1.3 Water Resource Laws

Clean Water Act (Federal Water Pollution Control Act) of 1972, PL 92-500, as amended (33 USC 1251-1387)

The objective of the CWA (PL 92-500, as amended; 33 USC §§ 1251 *et seq.*) is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters (Section 101a). The CWA has three major approaches to water pollution control:

- Construction grants for reducing municipal discharges;
- NPDES permits for control of point source (storm water and waste water) discharges; and
- Water quality management planning for nonpoint source control from diffuse natural origins such as sediment.

In 1972, Congress adopted a "zero-discharge" goal and a focus on "preventable causes of pollution" to emphasize the source of contamination rather than controls at the outfall or water body itself. Water quality standards include a legal designation of the desired use for a given body of water and the water quality criteria appropriate for that use. The criteria are specific levels of water quality which are expected to make a water body suitable for its desired use. Effluent limitations are restrictions on quantities, rates, and concentrations in wastewater discharges measured at the discharger's outfall pipe (Goldfarb 1984).

Administration of the act is delegated to the SWRCB in California. The RWQCB is responsible for setting water quality standards and criteria for water bodies in its regional plan and for issuing and enforcing NPDES permits.

Clean Water Act (Federal Water Pollution Control Act) of 1972, PL 92-500, as amended (33 USC 1251-1387): Section 401 Water Quality Certification, 1986, (33 USC 1341)

Section 401 requires state certification of federal permits that result in actions that discharge into navigable waters. Under Section 401, states have authority to review federal permits that may result in a discharge to wetlands or water bodies under state jurisdiction.

Clean Water Act (Federal Water Pollution Control Act) of 1972, PL 92-500, as amended (33 USC 1251-1387): Section 404 Permits for Dredged or Fill Material, 1977 (33 USC 1344) and the Rivers and Harbors Act of 1899 (33 USC 401 *et seq*.)

One of the laws most commonly affecting federal projects and properties is Section 404 of the federal CWA, passed in 1972 and jointly administered by the USACE and EPA. This section of the law regulates the discharge of dredged or fill material into the "waters of the United States," which also includes "jurisdictional wetlands." Discharges are any material that results in a change in the bottom elevation of a water body or wetland, including grading, road fills, stream crossings, building pads, and flood and erosion control on stream banks. Vernal pools are considered non-tidal waters that are isolated wetlands under Section 404.

The USACE is responsible for developing regulations for the Section 404 permit process and issuing permits, with the EPA maintaining power to veto the USACE's decisions. USACE's regulatory jurisdiction for tidal waters at SNI and all adjacent marshlands or wetlands under Section 404 extends up to the high tide line (higher high water mark). In the coastal zone, the USACE requires permits for certain structures, such as groins, breakwaters, riprap, jetties, and beach nourishment activities. Overlapping with the CWA, below the mean high water line, is authority under Section 10 of the Rivers and Harbors Act of 1899, which gives the USACE jurisdiction over projects involving construction, excavation, and deposition. Tidal and subtidal zone projects such as new marinas, piers, wharves, floats, intake and outfall pipes, pilings, bulkheads, boat ramps, and dredge and fill, require USACE permits.

Comments are provided to the USACE on specific projects by the USFWS and NMFS because of requirements of the Fish and Wildlife Coordination Act. If the USACE supports these comments, then proposals for project mitigation can become conditions of the permit, even though USFWS and NMFS do not have direct regulatory authority under the CWA. Their mitigation concerns may become measures added to permits to ensure marine habitat protection and restoration as a means to protect fish and wildlife populations.

There are 26 more or less generic nationwide permits that preauthorize certain minor discharges as long as they meet certain conditions (e.g. construction of outfall structures, backfill or bedding for utility lines, fill for bank stabilization, and minor road crossings). The nationwide permit system is currently being modified. If a discharge would cause the loss of or substantially modify one to 10 acres of water, including adjacent wetlands, then the nationwide permit may not apply. Work cannot begin until USACE notifies the U.S. Navy that the nationwide permit applies.

The individual permit process is much more complex and time-consuming. It requires consultation, an EA prepared by USACE, Public Interest Review and a 404(b)(1) Evaluation. If significant impacts are found, then an EIS must be prepared. These regulations apply to vernal pools. Customarily, the L.A. District Engineer requires and individual permit and an EA for fills in any vernal pool, regardless of the presence or absence of endangered species. The USACE is attempting to formalize requirements particular to vernal pools. A Memorandum of Agreement between USACE and EPA dated 07 February 1990 states that all potential impacts must first be shown to have been avoided, minimized and then compensated for. Compensation is considered a last resort only, which involves the creation of a habitat to replace a similar habitat unavoidably eliminated at a project site. The concerned agencies must be completely convinced that the proposed compensation will completely mitigate the lost habitat. Any activity in a wetland will require at least an EA.

Penalties: A Class I or civil penalty may not exceed $10,000 per violation, with the maximum amount of $25,000. Class II civil penalty may not exceed $10,000 per day as each violation continues, with the maximum amount not to exceed $125,000.

Federal Water Pollution Control Act Amendments

The Federal Water Pollution Control Act Amendments of 1972 (see CWA; PL 92-500; 33 USC §§ 1251 *et seq.*) sets up a federal permit and license system to carry out certain pollution discharge activities in navigable waters. Section 314 of this act established the Clean Lakes Program. The purpose of the Clean Lakes Program is to develop a national program to clean up publicly owned freshwater lakes. In order to receive a grant for in-lake restoration under this program, all point sources of pollution must be treated or have treatment planned under Section 201 and 402 of the CWA.

Safe Drinking Water Act

The Safe Drinking Water Act (42 USC §§ 300[f] *et seq.*) prescribes treatment and distribution control strategies for abating contamination of drinking water and also requires the establishment of a permit program to regulate injection of liquids into underground strata.

The Safe Drinking Water Act provides for direct control of underground injection of fluids that may affect groundwater supplies. States may assume the predominant role in executing groundwater protection programs. The EPA has direct responsibility only if a state chooses not to participate in an underground injection control program.

B.1.1.4 Soil Resource Laws

Soil Conservation Act (16 USC §§ 590a *et seq.*)

The Soil Conservation Act (PL 74-46; 16 USC § 590A) provides for application of soil conservation practices on federal lands. The act requires federal agencies to control and prevent soil erosion and preserve natural resources in managing federal lands.

B.1.1.5 Terrestrial and Aquatic Habitat Laws

Coastal Zone Management Act of 1972, PL 92-583, (16 USC 1451 *et seq.*) and its amendments

Two additional federal laws operate in the coastal zone: the Coastal Zone Management Act (CZMA) of 1972 and CZARA of 1990. The CZMA provides that a state that develops a Coastal Zone Management Program (CZMP) that is approved by the Secretary of Commerce (NOAA), is entitled to federal financial support in administering the program and must apply the program to some areas that otherwise would be subject to only federal regulation (16 USC § 1455-1456).

Federal agency activities affecting any land use or water use or natural resource of the coastal zone shall be carried out in a manner "which is consistent to the maximum extent practicable with the enforceable policies of approved state management programs" (16 USC § 1456). The term "enforceable policies" is defined by regulation as those legally binding laws, regulations, land use plans, ordinances, or judicial or administrative decisions that are part of a NOAA approved program. The CCC has authority to

implement provisions of the CZMP. Although USDON lands are excluded from the CZMA definition of "coastal zone" as "lands held in trust by or which uses are subject solely to the discretion of the federal government," activities on these lands may require a consistency determination if there are coastal zone impacts. According to OPNAVINST 5090.1C: "Federal actions that affect any land or water use or natural resource of the coastal zone must be consistent with the state program to the maximum extent practicable." Federal rules for federal consistency can be found in 15 CFR § 930.35–37. See further discussion on CZMA consistency under state agencies and laws in this Appendix.

Emergency Wetlands Resources Act of 1986, PL 99-645, as amended (16 USC 3901-3932)

This act, PL 99-645 (100 Stat. 3582), approved 10 November 1986, authorized the purchase of wetlands from Land and Water Conservation Fund monies, removing a prior prohibition on such acquisitions (USFWS 2010b). It required the Secretary to establish a National Wetlands Priority Conservation Plan, required the states to include wetlands in their Comprehensive Outdoor Recreation Plans, and transferred to the Migratory Bird Conservation Fund amounts equal to the import duties on arms and ammunition (USFWS 2010b).

It extended the Wetlands Loan Act authorization through 1988 and forgave the previous advances under the act (USFWS 2010b). It also required the Secretary to report to Congress on wetlands loss, including an analysis of the role of federal programs and policies in inducing such losses. In addition, it directed the Secretary, through the Service, to continue the National Wetlands Inventory; to complete by 30 September 1998, mapping of the contiguous U.S.; to produce, as soon as practicable, maps of Alaska and other non contiguous portions of the U.S.; and to produce, by 30 September 1990, and at ten-year intervals thereafter, reports to update and improve in the September 1982 "Status and Trends of Wetlands and Deepwater Habitat in the Coterminous United States, 1950s to 1970s" (USFWS 2010b).

Federal Flood Disaster Prevention Act (42 USC 4001)

The Federal Flood Disaster Prevention Act (PL 93-234; 42 USC §§ 4001 *et seq.*) established the Federal Flood Insurance Program, which has provided some incentives for construction outside flood-prone areas. To a limited degree, this has reduced destruction of riparian vegetation by developments. President Carter issued two executive orders in a related effort: E0 11988 (Floodplain Protection) directed federal agencies to avoid construction in flood-hazard areas and to seek restoration and preservation of the natural and beneficial values of floodplains; E0 11990 (Protection of Wetlands) directed federal agencies to minimize the destruction, loss, or degradation of wetlands.

Land and Water Conservation Act of 1965 (16 USC 4601 *et seq.*)

The Land and Water Conservation Act assists in preserving, developing, and assuring accessibility to outdoor recreation resources.

Legacy Resource Protection Program Act, PL 101-511

The Legacy Resource Protection Program Act established a program for the stewardship of biological, geophysical, cultural, and historic resources on USDOD lands.

North American Wetlands Conservation Act, PL 101-233 (16 USC 4401-4414)

North American Wetlands Conservation Act (103 Stat. 1968; 16 U.S.C. 4401-4412) - PL 101-233, enacted 13 December 1989, provides funding and administrative direction for implementation of the North American Waterfowl Management Plan and the Tripartite Agreement on Wetlands between Canada, U.S. and Mexico (USFWS 2010c).

The Act converts the Pittman-Robertson account into a trust fund, with the interest available without appropriation through the year 2006 to carry out the programs authorized by the act, along with an authorization for annual appropriation of $15 million plus an amount equal to the fines and forfeitures collected under the MBTA (USFWS 2010c).

Available funds may be expended, upon approval of the Migratory Bird Conservation Commission, for payment of not to exceed 50 percent of the United States' share of the cost of wetlands conservation projects in Canada, Mexico, or the U.S. (or 100 percent of the cost of projects on federal lands). At least 50 percent and no more than 70 percent of the funds received are to go to Canada and Mexico each year (USFWS 2010c).

A North American Wetlands Conservation Council is created to recommend projects to be funded under the Act to the Migratory Bird Conservation Commission (USFWS 2010c). The council is to be composed of the Director of the Service, the Secretary of the National Fish and Wildlife Foundation, a state fish and game agency director from each flyway, and three representatives of different non-profit organizations participating in projects under the plan or the act. The Chairman of the Council and one other member serve ex officio on the Commission for consideration of the Council's recommendations (USFWS 2010c).

The Commission must justify in writing to the Council and, annually, to Congress, any decisions not to accept Council recommendations (USFWS 2010c).

Public Law 101-593, approved 16 November 1990 (104 Stat. 2962), provided that the Director is the federal official responsible for compliance with NEPA with respect to Council actions, and that recommendation(s) from the Council to the Commission constitute agency action requiring the preparation of an EA or EIS. The Chairman of the Council is also required to take steps to ensure public notice of Council meetings (USFWS 2010c).

Public Law 103-375, 19 October 1994 (108 Stat. 3494), reauthorized the law through fiscal year 1998 and increased the authorization for appropriations to $20 million per year for 1995 and 1996 and $30 million per year through 1998. The amendment also acknowledged the role of Mexico in plan preparation and project selection and implementation and recognized that projects carried out in Mexico could include cash contributions from non-U.S. sources (USFWS 2010c).

Public Law 105-312, 30 October 1998 (112 Stat. 2958), provides for a reauthorization of the law and extends funding authority at the current level of $30 million per year through fiscal year 2003. An amendment to the law requires the Secretary of the Interior to reappoint Ducks Unlimited to fill one of the non-governmental organization seats on the North American Wetlands Council for a three-year term. It further requires the Secretary to publish a policy on how rotations will be handled in the future (USFWS 2010c).

Watershed Protection and Flood Prevention Act, PL 92-419 (16 USC 1001-1011, 33 USC 701)

The Watershed Protection and Flood Prevention Act (PL 83-566), 04 August 1954, as amended, authorized the USDA NRCS to cooperate with states and local agencies to carry out works of improvement for soil conservation and for other purposes including flood prevention; conservation, development, utilization and disposal of water; and conservation and proper utilization of land (NRCS 2010).

NRCS implements the Watershed Protection and Flood Prevention Act through three programs:

- Watershed Operations
- Watershed Protection and Flood Prevention Operations
- Watershed Rehabilitation

Watershed Operations. Watershed Operations is a voluntary program which provides assistance to sponsoring local organizations of authorized watershed projects, planned and approved under the authority of the Watershed Protection and Flood Prevention Act of 1954 (PL 83-566), and eleven designated watershed authorized by the Flood Control Act of 1944 (PL 78-534) (NRCS 2010). The NRCS provides technical and financial assistance to states, local governments and Tribes (project sponsors) to implement authorized watershed project plans for the purpose of watershed protection; flood mitigation; water quality improvements; soil erosion reduction; rural, municipal and industrial water supply; irrigation water management; sediment control; fish and wildlife enhancement; and wetlands and wetland function creation and restoration (NRCS 2010).

Watershed Protection and Flood Prevention Operations. The Flood Control Act of 22 December 1944 authorized the Secretary of Agriculture to install watershed improvement measures to reduce flood, sedimentation, and erosion damages; further the conservation, development, utilization, and disposal of water; and the conservation and proper utilization of land (NRCS 2010).

Watershed Rehabilitation. Local communities, with NRCS assistance, have constructed over 11,000 dams in 47 states since 1948 (NRCS 2010).

B.1.1.6 Wildlife Population Laws

Animal Damage Control Act (7 USC 426 §§ *et seq*.)

The Animal Damage Control Act provides broad authority for investigation, demonstrations and control of mammalian predators, rodents, and birds.

Fish and Wildlife Conservation Act of 1980, PL 96-366 (16 USC §§ 2901-2912)

The Fish and Wildlife Conservation Act of 1980 (PL 96-366; 16 USC §§ 2901 *et seq*.) provides for conservation, protection, restoration and propagation of certain species, including migratory birds threatened with extinction.

Fish and Wildlife Coordination Act of 1934, PL 85-624, as amended (16 USC §§ 661-666c)

The Fish and Wildlife Coordination Act (PL 85-624; 16 USC §§ 661 *et seq*.) is a law which mandates that wildlife conservation receive equal consideration and be coordinated with other features of water resource development. The intent is to prevent loss or damage of wildlife and provide for development and improvement of wildlife in conjunction with water development projects. Federal agencies proposing to impound, divert, or control surface waters are required to consult with the USFWS and CDFG, to include and give full consideration to the recommendations of these agencies, and to provide justifiable means and measures for benefiting wildlife in project plans. USACE must coordinate permit applications with USFWS and CDFG. Like NEPA, implementation of this act is essentially procedural in that no particular outcome is mandated. The act authorizes project modification, land acquisition, and other measures necessary to protect wildlife.

Magnuson Stevens Fishery Conservation and Management Act, PL 94-265, (16 USC 1801-1884) as amended

The Magnuson Stevens Fishery Conservation and Management Act provides conservation and management of fishery resources, develops domestic fisheries, and phases out foreign fishing activity within the Exclusive Economic Zone (EEZ). Eight Regional Fishery Management Councils implement the goals of the Act in coordination with the NMFS. The PFMC manages the fisheries resources off Washington, Oregon, and California by developing Fisheries Management Plans for the EEZ. The PFMC is funded through the Department of Commerce.

Management plans adopted and implemented to date include one for the:

- Pacific Coast Groundfish Fishery
- Pacific Coast Salmon Fishery
- Coast Pelagic Species Fishery

A management plan for *West Coast Highly Migratory Species* (tunas, sharks, billfish/swordfish, and dorado [also known as dolphinfish and mahi-mahi]) was partially approved in 2004. California state fishing regulations (such as the Nearshore Fishery Management Plan as it applies to groundfish species, see below) must be consistent with federal law for species managed by the PFMC.

This act assigns to NMFS responsibility for identifying EFH for all species which are federally managed and for determining whether projects or activities adversely impact EFH zones. These zones are broadly defined as those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.

When projects are planned that can adversely affect EFH, NMFS can recommend conservation measures to minimize problems. While such habitat-related comments (outside of ESA consultations) have had little effect in the past, new requirements for federal agency consultation on activities that may affect EFH have changed that. Once the Navy receives NMFS comments on means to better avoid or minimize habitat damage, it must respond in writing within 30 days, outlining the measures it is proposing to avoid, mitigate, and offset the impact of the activity on EFH. The Navy must also explain any inconsistencies between the avoidance and mitigation actions they propose to take and the recommendations made by NMFS.

Marine Mammal Protection Act of 1972, PL 92-522, (16 USC 1361)

The MMPA was enacted on 21 October 1972. All marine mammals are protected under the MMPA. The MMPA prohibits, with certain exceptions, the "take" of marine mammals in U.S. waters and by U.S. citizens on the high seas and the importation of marine mammals and marine mammal products into the U.S. (NOAA Fisheries 2010).

Congress passed the 1972 MMPA based on the following findings and policies:

- Some marine mammal species or stocks may be in danger of extinction or depletion as a result of human activities;
- These species or stocks must not be permitted to fall below their optimum sustainable population level ("depleted");
- Measures should be taken to replenish these species or stocks;
- There is inadequate knowledge of the ecology and population dynamics; and
- Marine mammals have proven to be resources of great international significance.

The MMPA was amended substantially in 1994 to provide for:

- Certain exceptions to the take prohibitions, such as permits and authorizations for scientific research;
- A program to authorize and control the taking of marine mammals incidental to commercial fishing operations;
- Preparation of stock assessments for all marine mammal stocks in waters under U.S. jurisdiction; and
- Studies of pinniped-fishery interactions.

The SNI Natural Resources program complies with the MMPA through requesting LOA permits for the potential harassment of pinnipeds at marine mammal haul out locations during naval readiness training activities at SNI.

Migratory Bird Treaty Act of 1918, 40 Stat. 755, as amended (16 USC §§ 703-712)

The MBTA (16 USC § 703 *et seq.*) of 1918 is a federal statute that implements four treaties with the U.S. and Canada, Mexico, Japan, and Russia on the conservation and protection of migratory birds. It uses federal permits as a tool to assist in the conservation of migratory birds to authorize otherwise prohibited activities for scientific, educational, cultural, and other purposes.

The number of bird species covered by the MBTA is extensive and is listed at 50 CFR Sec. 10.13. Further, the regulatory definition of "migratory bird" is broad and includes any mutation or hybrid of an identified species and includes any part, egg, or nest of such bird (50 CFR § 10.12). A federal court in Washington, D.C., had ruled in 2002 that the MBTA covers all migratory birds, even if they are invasive aliens. The Migratory Bird Treaty Reform Act (MBTRA) of 2004 amended the MBTA to clarify that only species that are native to the U.S. are protected under that act. It clarified, in statute, that the protections and programs outlined in the MBTA of 1916 and the Congressionally approved regulations attached to the Act in 1918 apply only to native birds, not the increasing and increasingly problematic alien or exotic bird populations. As required by the MBTRA, the USFWS has published a List of Bird Species to Which the MBTA Does Not Apply which includes "all non-native, human-introduced bird species..." This list may be found in Volume 70, Number 49, Pages 12710-12716 of the Federal Register dated on 15 March 2005.

The MBTA, which is enforced by the USFWS, makes it unlawful “by any means or in any manner, to pursue, hunt, take, capture [or] kill” any migratory bird, or attempt such actions, except as permitted by regulation. The applicable regulations prohibit the take, possession, import, export, transport, sale, purchase, barter, or offering of these activities, except under a valid permit or as permitted by the implementing regulations (50 CFR § 21.11).

The USFWS migratory bird depredation permits (Title 50 CFR § 21.43) are required before any person may take, possess, or transport migratory birds, except for yellow-headed blackbirds, red-winged blackbirds, rusty blackbirds, Brewer’s blackbirds, cowbirds, all grackles, crows, and magpies found committing or about to commit depredations upon ornamental or shade trees, agricultural crops, livestock, or wildlife, or when concentrated in such numbers and manner as to constitute a health hazard or other nuisance. When horned larks, golden-crowned, white-crowned and other crowned sparrows, and house finches are, under extraordinary conditions, seriously injurious to agriculture or other interests, the Commissioner of Agriculture may, without a permit, kill or cause to be killed, under his/her general supervision, such of the above migratory birds as may be necessary to safeguard any agricultural or horticultural crop. No permit is necessary merely to scare or herd depredating migratory birds other than threatened or endangered species or bald or golden eagles.

The USFWS has sole authority for coordinating and supervising all federal migratory bird management activities, including enforcement of statutes regulating the taking of protected species (game and nongame) by individuals and federal agencies. The MBTA provides the USFWS the opportunity to comment on projects potentially affecting bird species, and their habitats, that are not protected under the ESA. Violations of the MBTA can result in criminal and civil penalty. Therefore, if a project has the potential to affect nesting birds or nesting substrate (e.g. trimming nest trees) a qualified biologist from the Natural Resources Office must be contacted to determine if there will be any violations.

There have been recent developments regarding implementation of the MBTA and USDOD. Following a U.S. District Court decision which granted an injunction on live fire military training on behalf of a private party, Congress enacted the 2003 NDAA, which authorized an interim period during which the prohibitions on incidental take of migratory birds would not apply to military readiness activities. During this interim period, Congress also directed the Secretary of Interior to, not later than one year after enactment of the NDAA, promulgate a regulation to deal with the incidental take of migratory birds in conjunction with military readiness activities from the take prohibition of the MBTA. Under the 2003 NDAA, the House Armed Services Committee authorized a set of initiatives intended to "restore a balance between protecting the environment and military readiness." One of these initiatives, regarding the MBTA, stated:

> "The Migratory Bird Treaty Act allows federal agencies to obtain permits to remove migratory birds for economic or safety reasons, such as clearing geese from a golf course or runway. However, a federal court ruled in March 2002 that Navy activities at a training range near Guam violated the MBTA because the court felt that the law does not allow for permits for the accidental taking of birds during military readiness activities. As a result, the court temporarily shut down military training at the facility. In order to ensure that USDOD can operate all of its facilities without further interruptions of this nature, the conferees provided the USDOD with authority under which the MBTA would not apply to the incidental taking of a migratory bird by USDOD during an authorized military readiness activity. In addition, the conferees directed the Secretary of the Interior, with the concurrence of USDOD, to exercise its authority within one year to initiate regulations that would exempt USDOD from the MBTA for incidental takings of migratory birds during authorized military readiness activities."

USDOD Migratory Bird Rule and Guidance

The new Migratory Bird Rule relates to military readiness activities and was established in accordance with Section 315 of the NDAA for FY 2003. The final rule, “Migratory Bird Permits: Take of Migratory Birds by the Armed Forces”, was published as 50 CFR Part 21 in the 28 February 2007 FR (pg. 8931-8950). It authorizes the military to "take" migratory birds under the MBTA without a permit, but if the military determines that the activity will "significantly" affect a population of migratory birds, they must work with the USFWS to implement conservation measures to minimize/mitigate the effects.

This is different from the USFWS-USDOD MOU (FR 30 August 2006) which addresses the conservation of migratory birds on military lands in relation to all activities except readiness. Key to implementing the MBTA Rule and guidance documents on the MOU between the USFWS and USDOD are the wording of the authorization for take that requires an understanding of the definition of the following terms:

Population, as used in Section 21.15, a group of distinct, coexisting (conspecific) individuals of a single species, whose breeding site fidelity, migration routes, and wintering areas are temporally and spatially stable, sufficiently distinct geographically (at some time of the year), and adequately described so that the population can be effectively monitored to discern changes in its status.

Significant adverse effect on a population, used in Section 21.15, means an effect that could, within a reasonable period of time, diminish the capacity of a population of migratory bird species to sustain itself at a biologically viable level. A population is "biologically viable" when its ability to maintain its genetic diversity, to reproduce, and to function effectively in its native ecosystem are not significantly harmed. This effect may be characterized by increased risk to the population from actions that cause direct mortality or a reduction in fecundity. Assessment of impacts should take into account yearly variations and migratory movements of the impacted species. Due to the significant variability in potential military readiness activities and the species that may be impacted, estimates of significant measurable decline will be determined on a case-by-case basis.

In April 2007, guidance was issued by the Under Secretary of Defense for Acquisition, Technology and Logistics on implementing the MOU to Promote the Conservation of Migratory Birds between the USFWS and USDOD in accordance with EO 13186 (17 January 2001). This guidance covers all activities on Navy property including natural resources management, routine maintenance and construction, industrial activities, and hazardous waste cleanups.

The guidance emphasizes interdisciplinary collaboration within the framework of North American Bird Conservation Initiative (NABCI) Bird Conservation Regions, collaborative inventory and long-term monitoring. Many questions remain about how to implement the Migratory Bird Rule and the new guidance on the USFWS-USDOD MOU. For example, how the evaluation of significance needs to be addressed in decision documents is still being worked out. Since the impact assessment must be conducted on populations of migratory birds, there may be a need to collect better population baseline data. Conservation measures undertaken under the Migratory Bird Rule require monitoring and record-keeping for five years from the date the Armed Forces commence their conservation action. During INRMP reviews, the Armed Forces must report to the USFWS migratory bird conservation measures implemented and the effectiveness of the conservation measures in avoiding, minimizing, or mitigating take of migratory birds.

USDOD Migratory Bird MOU and Executive Order 13186

For USDOD activities other than military readiness, migratory bird concerns are addressed through an MOU (July 2006) developed in accordance with EO 13186 "Responsibilities of Federal Agencies to Protect Migratory Birds," signed 10 January 2001 (66 FR 3853). The USFWS-USDOD MOU (FR 30 August 2006) that evolved out of the requirements of the EO addresses the conservation of migratory birds on military lands in relation to all activities except readiness. The MOU is a guidance document on how the USDOD will conserve migratory birds and does not authorize any take. In April 2007, further guidance was issued by the Under Secretary of Defense for Acquisition, Technology and Logistics on implementing the MOU to Promote the Conservation of Migratory Birds between the USFWS and USDOD in accordance with EO 13186. This guidance covers all activities at SNI, including natural resources management, routine maintenance and construction, industrial activities, and hazardous waste cleanups. The guidance emphasizes interdisciplinary collaboration within the framework of NABCI Bird Conservation Regions, collaborative inventory and long-term monitoring. The EO directs executive departments to take certain actions regarding the protection of migratory birds. In the interim period until the MOU is signed, the EO encourages

federal agencies "to begin immediately implementing the conservation measures" identified in the EO, "as appropriate and practicable." The DASN(I&E), in a 19 January 2001 memorandum to the CNO and Commandant of the Marine Corps, issued guidance on EO compliance. This guidance provides that U.S. Navy activities should comply with the "intent" of the EO until the EO required MOU is completed.

A Council for the Conservation of Migratory Birds was established to help agencies implement the EO. The EO requires NEPA evaluations to include effects on migratory birds and that advance notice or annual reports must be made to the USFWS concerning actions that result in the taking of migratory birds. The EO also requires agencies to control the establishment of exotic species that may endanger migratory birds and their habitat. Pursuant to its MOU, each agency shall, to the extent permitted by law and subject to the availability of appropriations and within administration budgetary limits, and in harmony with agency missions:

- Support the conservation intent of the migratory bird conventions by integrating bird conservation principles, measures, and practices into agency activities and by avoiding or minimizing, to the extent practicable, adverse impacts on migratory bird resources when conducting agency actions;
- Restore and enhance the habitat of migratory birds, as practicable;
- Prevent or abate the pollution or detrimental alteration of the environment for the benefit of migratory birds, as practicable;
- Design migratory bird habitat and population conservation principles, measures, and practices, into agency plans and planning processes (natural resource, land management, and environmental quality planning, including, but not limited to, forest and rangeland planning, coastal management planning, watershed planning, etc.) as practicable, and coordinate with other agencies and nonfederal partners in planning efforts;
- Within established authorities and in conjunction with the adoption, amendment, or revision of agency management plans and guidance, ensure that agency plans and actions promote programs and recommendations of comprehensive migratory bird planning efforts such as PIF, U.S. National Shorebird Plan, North American Waterfowl Management Plan, North American Colonial Waterbird Plan, and other planning efforts, as well as guidance from other sources, including the Food and Agricultural Organization's International Plan of Action for Reducing Incidental Catch of Seabirds in Longline Fisheries;
- Ensure that environmental analyses of federal actions required by the NEPA or other established environmental review processes evaluate the effects of actions and agency plans on migratory birds, with emphasis on species of concern;
- Provide notice to USFWS in advance of conducting an action that is intended to take migratory birds, or annually report to USFWS on the number of individuals of each species of migratory birds intentionally taken during the conduct of any agency action, including but not limited to banding or marking, scientific collecting, taxidermy, and depredation control;
- Minimize the intentional take of species of concern by: (i) delineating standards and procedures for such take; and (ii) developing procedures for the review and evaluation of take actions. With respect to intentional take, the MOU shall be consistent with the appropriate sections of 50 CFR parts 10, 21, and 22;
- Identify where unintentional take reasonably attributable to agency actions is having, or is likely to have, a measurable negative effect on migratory bird populations, focusing first on species of concern, priority habitats, and key risk factors. With respect to those actions so identified, the agency shall develop and use principles, standards, and practices that will lessen the amount of unintentional take, developing any such conservation efforts in cooperation with the USFWS. These principles, standards, and practices shall be regularly evaluated and revised to ensure that they are effective in lessening the detrimental effect of agency actions on migratory bird populations. The agency also shall inventory and monitor bird habitat and populations within the agency's capabilities and authorities to the extent feasible to facilitate decisions about the need for, and effectiveness of, conservation efforts;

- Within the scope of its statutorily-designated authorities, control the import, export, and establishment in the wild of live exotic animals and plants that may be harmful to migratory bird resources;
- Promote research and information exchange related to the conservation of migratory bird resources, including coordinated inventorying and monitoring and the collection and assessment of information on environmental contaminants and other physical or biological stressors having potential relevance to migratory bird conservation. Where such information is collected in the course of agency actions or supported through federal financial assistance, reasonable efforts shall be made to share such information with USFWS, the USGS-Biological Resources Division, and other appropriate repositories of such data (e.g. the Cornell Laboratory of Ornithology);
- Provide training and information to appropriate employees on methods and means of avoiding or minimizing the take of migratory birds and conserving and restoring migratory bird habitat;
- Promote migratory bird conservation in international activities and with other countries and international partners, in consultation with the Department of State, as appropriate or relevant to the agency's authorities;
- Recognize and promote economic and recreational values of birds, as appropriate; and
- Develop partnerships with non-federal entities to further bird conservation.

Migratory Bird Treaty Act as amended by the National Defense Authorization Act of 2003

The NDAA (2003 Authorization) for FY 2003 exempted the USDOD from the MBTA for the incidental take of migratory birds as a result of otherwise authorized military readiness activities until the Secretary of Interior prescribes regulations authorizing such take. The USDOD shall give appropriate consideration to the protection of migratory birds when planning and executing military readiness activities. As indicated in the proposed rule, migratory bird conservation will be incorporated into INRMPs, where applicable, to mitigate where needed and to protect migratory birds and their habitats.

B.1.1.7 Species of Concern Laws

Bald Eagle Protection Act

The Bald Eagle Protection Act (Bald and Golden Eagles Act; PL 95-616; 16 USC §§ 668 *et seq.*) of 1979 provides for protection of the bald eagle and the golden eagle by prohibiting taking, possession, and commerce in the birds.

Endangered Species Act of 1973, PL 93-205, (16 USC 1531-1534)

Once a species becomes listed as endangered or threatened, regulations to protect the species from illegal "take" become applicable to any project carried out or funded by federal departments such as USDOD that may affect an individual animal or its habitat. A "take" is defined as to: "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect" a listed species, or attempt to do so. The USFWS was charged by Congress with overseeing ESA implementation for all species except most marine species, which are under jurisdiction of the NMFS.

Section 7(a)(1) of the ESA states that all federal agencies shall utilize their authorities in furtherance of the purposes of the ESA by carrying out programs for the conservation of endangered species and threatened species listed pursuant to Section 4 of the ESA. "Conservation" is defined in the ESA as "to use…all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to this [ESA] are no longer necessary. Such methods and procedures include, but are not limited to, all activities associated with scientific resources management such as research, census, law enforcement, habitat acquisition and maintenance, propagation, live trapping, and transplantation, and, in the extraordinary case where population pressures within a given ecosystem cannot be otherwise relieved, may include regular taking."

Under Section 7(a)(2) of the ESA, federal project proponents must consult with USFWS or NMFS if one or more listed species may be affected by an action. Consultation with USFWS or NMFS may range from informal discussions to formal consultation requiring a BA by the project proponent (Figure B-1). For nonfederal project applicants, the USACE takes the lead in this consultation if the issue is within their jurisdiction. Other federal agencies may appropriately be named as the action agency that must conduct the consultation. With the issuance of a BO, "terms and conditions" are stated, which are measures to avoid or minimize the take of any listed species. A BO must include: (1) a summary of the information on which the opinion was based (the information is to be provided by the federal agency), (2) a detailed discussion of the effects of the action on listed species or critical habitat, and (3) the USFWS opinion on whether the action is likely to jeopardize the continued existence of a listed species or adversely modify critical habitat.

The BO may include an incidental take statement that specifies: (1) the amount of "take" that is allowed, (2) reasonable and prudent measures that the USFWS considers necessary or appropriate to minimize such a "take", and (3) the terms and conditions that must be complied with to implement the reasonable and prudent measures. When an "incidental take statement" is issued with the BO, the federal project proponent may be excused from incidentally taking a listed species as part of the agency's otherwise lawful activity as long as the specified taking conditions are met. Section 10 of the ESA also provides for a similar incidental take permit for private, state, and local government projects. To qualify, the project proponent must submit a habitat conservation plan and also seek to minimize and mitigate the impacts of the taking to the "maximum extent practicable."

Critical habitat may be designated for a listed species, in which case such habitat may require special management consideration or protection. Section 318(a) of the NDAA for FY 2004 (PL 108-136) made changes to the ESA regarding INRMPs. These changes were justified on the basis of the need to promote military readiness while protecting listed species. Under new Section 4(a)(3)(B)(i) of the ESA, the Secretary of the Interior or the Secretary of Commerce, as appropriate, may be precluded from designating critical habitat on any areas owned, controlled, or designated for use by USDOD where an INRMP has been implemented that, as determined by the Interior or Commerce Secretary, provides a benefit to the species for which critical habitat designation is proposed.

The Navy must take measures to assure that no irreversible or irretrievable commitment of resources is authorized, funded or carried out by them that will likely jeopardize the continued existence of any threatened or endangered species or destroy or adversely modify designated critical habitat, until the consultation process is complete. The Navy is to provide leadership in identifying and protecting habitat that is critical for any threatened or endangered species.

Navy installations are required to carry out the following:

1. Maintain liaison with local governmental agencies and organizations having an interest in endangered and threatened species protection;
2. Delineate boundaries of the habitat areas of endangered and threatened species on maps;
3. Initiate consultation with the USFWS or NMFS per cooperative agreement procedures when a proposed action or program has been identified that may affect listed species or their habitat;
4. Perform a BA for any action that may adversely affect the continued existence of endangered and threatened species or result in the destruction or adverse modification of habitat of such species (the BA should contain the final BO of the USFWS or NMFS following the consultation process);
5. Cooperate with the USFWS or NMFS during development and implementation of a recovery plan for listed species occurring on the installation.

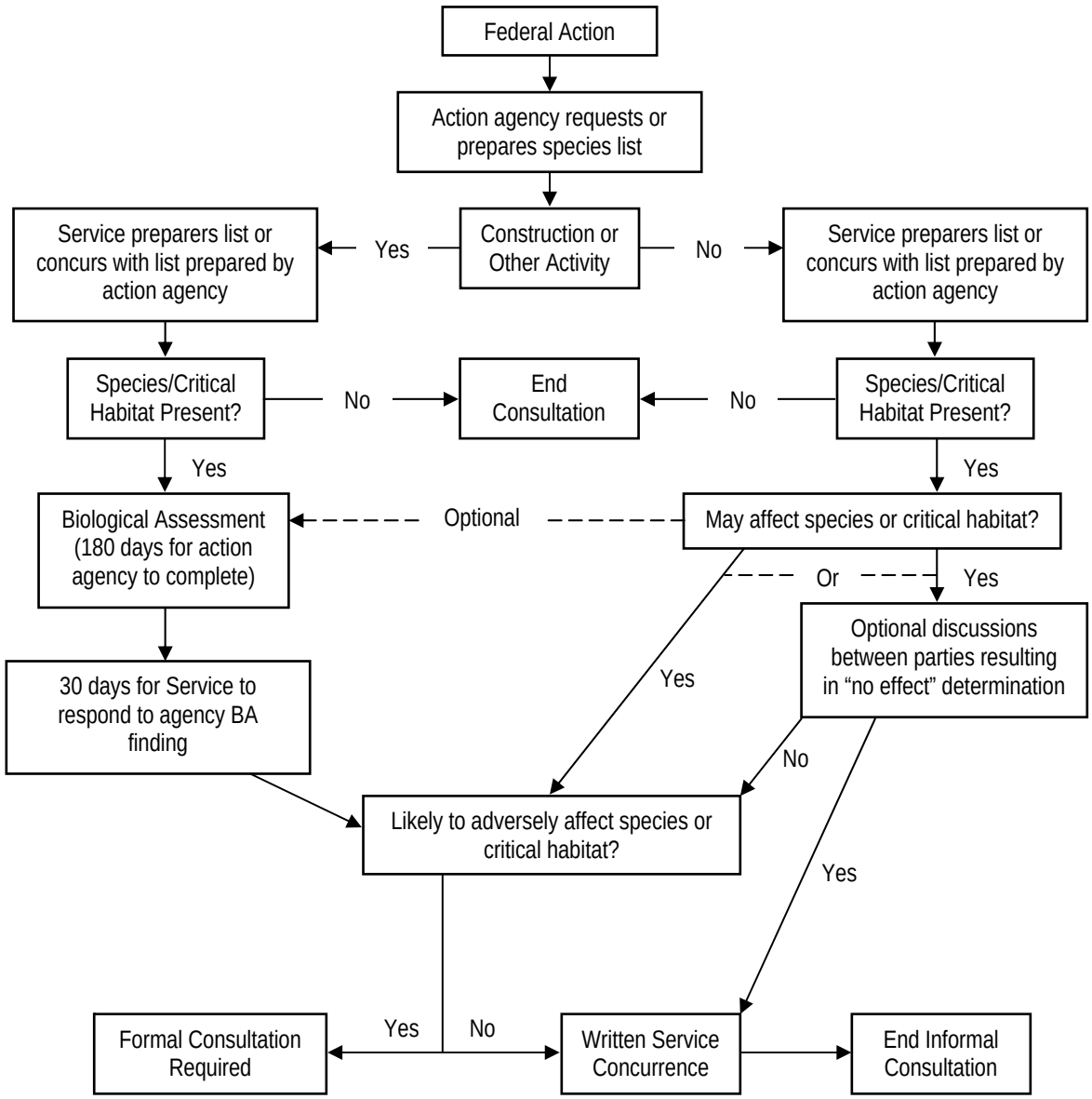

Figure B-1. Informal federal process for Endangered Species Act Consultation (USFWS and NMFS 1998).

NAWCWD submitted a Programmatic Biological Assessment in December 2000 to initiate a Section 7 consultation for Naval activities that occur at SNI. The USFWS was named the action agency in this consultation and subsequently prepared a BO for Activities on SNI (1-8-01-F-14) on 15 October 2001. This BO addressed naval activities affecting the federally threatened island night lizard and western snowy plover and federally de-listed brown pelican. This BO included an incidental take statement, reasonable and prudent measures, and terms and conditions that affect naval activities at SNI. The management strategies recommended in Section 4 of this INRMP take into account the incidental take statement, reasonable and prudent measures, and terms and conditions discussed in that BO.

This INRMP must undergo an internal Section 7 review by staff to determine if consultation is needed. In addition, the INRMP must clearly demonstrate a benefit to the species (Appendix D).

ESA Penalties: Civil penalty of up to $25,000 per violation or criminal penalty of up to $50,000 and/or one year in prison, knowing violation for a take or damage/destruction of critical habitat of an endangered animal.

Federal Noxious Weed Act of 1974, PL 93-629, as amended (7 USC §§ 2801-2814)

The Federal Noxious Weed Act of 1974 (PL 93-629; 7 USC § 2801) provides for the management of undesirable plants and their regulation in interstate and foreign commerce.

Noxious Plant Control Act (43 USC 1241)

The Noxious Plant Control Act (PL 90-583; 43 USC § 1241) provides for the control of noxious plants on lands under control or jurisdiction of the federal government.

B.1.2 Federal Cultural Resource Laws

American Antiquities Act of 1906, PL 59-209 (16 USC §§ 431-433)

The American Antiquities Act provides for the protection of items of archaeological significance, both historic and prehistoric. The Antiquities Act of 1906 (PL 59-209; 16 USC §§ 431 *et seq.*, 1982) authorizes the President to designate as National Monuments historic and natural resources of national significance located on federally owned or controlled lands. The act further provides for the protection of all historic and prehistoric ruins and objects of antiquity located on federal lands by providing criminal sanctions against excavation, injury, or destruction of such antiquities without the permission of the Department having jurisdiction over such resources. The Secretaries of the Interior, Agriculture, and Defense are further authorized to issue permits for archaeological investigations on lands under their control to recognized educational and scientific institutions for the purposes of systematically and professionally gathering data of scientific value.

American Indian Religious Freedom Act of 1978, PL 95-341, as amended (42 USC §§ 1996-1996a)

The American Indian Religious Freedom Act of 1978 (PL 95-341; 42 USC§ 1996) directs consultations with traditional leaders, where appropriate, to ensure continuity in religious practices on federal lands. It requires the federal government to protect the right of American Indian, Eskimo, Aleut, and Native Hawaiian to exercise traditional religious practices.

Archaeological and Historic Preservation Act (Moss-Bennett Act) of 1974, PL 86-532 (16 USC §§ 469-469c)

The Archaeological and Historic Preservation Act of 1974 (Moss-Bennett Act; 16 USC §§ 469 *et seq.*) provides for the protection of historic and archaeological sites threatened by federal or federally funded or assisted construction projects.

Archeological Resources Protection Act of 1979, PL 96-95 (16 USC §§ 470aa-470mm)

The Archaeological Resources Protection Act of 1979 (16 USC §§ 470 *et seq.*, 1982) sets up penalties for destruction or removal of archaeological materials from federal land without the proper permits. Requirements for obtaining these permits are also established by this regulation.

Historic Sites Act of 1935, PL 292 (16 USC §§ 461-467)

The Historic Sites Act of 1935 (PL 74-292; 16 USC §§ 461 *et seq.*, 1982) establishes as national policy the preservation for public use of historic sites, buildings, and objects by giving the Secretary of the Interior the power to make historic surveys and to document, evaluate, acquire, and preserve archaeological and historic sites across the country. This Act led to the eventual establishment within the NPS of the Historic Sites Survey, the Historic American Building Survey (HABS), the Historic American Engineering Record (HAER), and the National Historic Landmarks Program.

National Historic Preservation Act of 1966, PL 89-665, as amended (16 USC §§ 470-470x-6)

The NHPA of 1966 (PL 89-665; 16 USC §§ 470 *et seq.*) provides for the preservation of historic properties throughout the U.S. This Act expanded the National Register of Historic Places (NRHP) and created an Advisory Council on Historic Preservation. Section 106 of the Act requires that federal agencies allow the Council an opportunity to comment whenever their undertakings may affect NRHP resources or resources eligible for listing in the NRHP. Section 110 requires federal agencies to identify, evaluate, inventory, and protect National Register resources or resources eligible for the NRHP on property they control. NHPA imposes no absolute preservation requirement, as long as the U.S. Navy follows and documents mandated procedures for any U.S. Navy decision not to preserve.

Native American Graves Protection and Repatriation Act of 1990, PL 101-601 (25 USC §§ 3001-3013)

The Native American Graves Protection and Repatriation Act of 1990 (PL101-601; 25 USC §§ 3001 *et seq.*) gives ownership and control of Native American human remains, funerary objects, sacred objects and objects of cultural patrimony that are excavated or discovered on federal land to federally recognized American Indian tribes or Native Hawaiian organizations. The law also establishes criminal penalties for trafficking in human remains or cultural objects, and requires agencies and museums that receive federal funding to inventory those items in their possession, identify the descendants of and repatriate those items.

B.1.3 Other Federal Laws

Americans with Disabilities Act of 1990

This Act prohibits discrimination and ensures equal opportunity for persons with disabilities in employment, State and local government services, public accommodations, commercial facilities, and transportation.

Anti-Deficiency Act (31 USC 1341 *et seq.*)

This act places limitations on expending and obligating amounts for an officer or employee of the U.S. Government, including expenditures related to natural resource management efforts.

Data Quality Act

Under the Data Quality Act, which took effect 01 October 2002, federal agencies must ensure that the information it uses and disseminates meets certain quality standards. The Data Quality Act requires federal agencies to issue guidelines ensuring the quality, utility, objectivity and integrity of information that they disseminate and provide mechanisms for affected persons to correct such information by petitioning and challenging the quality of information it has used or disseminated. Two questions that remain unanswered about the Data Quality Act is whether agency information quality guidelines apply to rule-making and whether an agency's denial of a petition to correct information is able to be reviewed by the courts.

Defense Appropriations Act

The Defense Appropriations Act of 1991 Legacy Program (10 USC § 2701) provides for the stewardship of biological, geophysical, cultural and historic resources on USDOD lands.

Disabled Sportsman Access Act of 1998

The Paralyzed Veterans of America spearheaded the passage of the Disabled Sportsmen's Access Act of 1998 (PL 105-261). This Act establishes a mechanism by which outdoor recreation programs on military installations will be accessible to disabled veterans, dependents with disabilities, and all others with disabilities. These outdoor recreational opportunities will allow access to nearly 30 million acres of military lands for such sports as fishing, hunting, trapping, wildlife viewing, boating, trapping, and camping.

Emergency Planning and Community Right-to-Know Act

The EPCRA of 1986 (42 USC § 11001 *et seq.*) is also known as Title III of the SARA. EPCRA focuses on the hazards associated with toxic chemical releases. Most notably, specific sections of EPCRA require immediate notification of releases of oil and hazardous substances and CERCLA-defined hazardous substances to state and local emergency response planners. The EPCRA requires state and local coordination in planning response actions to chemical emergencies. The Act requires certain industries to submit information on chemical inventories and fugitive emissions.

Federal Facilities Compliance Act

The Federal Facilities Compliance Act (42 USC § 6961) of 1992 amends the RCRA. It subjects federal agencies to civil and administrative penalties for noncompliance with federal, state, interstate, or local solid and hazardous waste requirements (Subtitles C and D of RCRA).

Military Construction and Authorization Act

The Military Construction Authorization Act of 1975 (10 USC § 2665) allows the proceeds from the sale of recyclable material be credited to the installation to cover specified costs.

Military Construction Authorization Act-Leases; Non-Excess Property

The Military Construction Authorization Act- Leases; Non-excess property (10 USC § 2667) provides for the outleasing of public lands.

Military Construction Authorization Act - Military Reservation and Facilities-Hunting, Fishing and Trapping

The Military Construction Authorization Act - Military Reservation and Facilities-Hunting, Fishing and Trapping (10 USC § 2671) requires that all hunting, fishing, and trapping on military installations follow Fish and Game laws of the state in which it is located, and be issued appropriate state licenses for these activities.

National Trails Systems Act

The National Trail Systems Act of 1968 (16 USC § 1271) promotes development of recreational, scenic, and historic trails for persons of diverse interests and abilities.

Outdoor Recreation-Federal/State Program Act

The Outdoor Recreation-Federal/State Program Act (PL 88-29; 16 USC §§ 460[L] *et seq.*) provides for the management of lands used for outdoor recreation. It requires consultations with the NPS regarding management.

B.2 Executive Orders

B.2.1 Executive Orders Relevant to Natural Resources

B.2.1.1 Environmental Executive Orders

Federal Agency Recycling and the Council on Federal Agency Recycling and Procurement Policy (EO 12780)

Federal Agency Recycling and the Council on Federal Agency Recycling and Procurement Policy (EO 12780) requires federal agencies to promote cost-effective waste reduction and recycling of reusable materials and the establish federal preferences for procurement of items made from recycled materials.

Federal Compliance with Pollution Control Standards (EO 12088)

Federal Compliance with Pollution Control Standards (EO 12088) provides that the head of each federal agency is responsible for compliance with "applicable pollution control standards," defined as "the same substantive procedural and other requirements that would apply to a private person." It requires federal agencies to cooperate with the EPA, states and local agencies in the prevention, control and abatement of environmental pollution. It requires the EPA administrator to provide technical advice and assistance to executive agencies in order to ensure their cost effective and timely compliance with applicable pollution control standards. It provides that disputes between the EPA and another federal agency regarding environmental violations shall be elevate to the Office of Management and Budget for resolution.

Federal Compliance with Right-to-Know Laws and Pollution Prevention Requirements (EO 12856)

Federal Compliance with Right-to-Know Laws and Pollution Prevention Requirements (EO 12856) of 03 August 1993 directs all Federal agencies to comply with all provisions of the Emergency Planning and Community Right-to-Know Act and the Pollution Prevention Act and implementing regulations. It mandates leadership in pollution prevention at Federal facilities and in providing information to the public concerning the manufacture, process, use and release or transfer of toxic chemicals and pollutants at these facilities. It also requires the head of each Federal agency to develop a written pollution prevention strategy including a pollution prevention policy statement. Each agency was required to reduce releases of toxic chemicals and off-site transfers of such chemicals by 50 percent by the end of 1999.

Greening the Government through Efficient Energy Management (EO 13123)

Greening the Government Through Efficient Energy Management (EO 13123) dated 03 June 1999 directs the federal government to significantly improve its energy management in order to save taxpayer dollars and reduce emissions that contribute to air pollution and global climate change. It promotes energy efficiency through energy efficient building design, construction, and operation; water conservation; use of renewable technologies; and fostering markets for emerging technologies.

Greening the Government through Leadership in Environmental Management (EO 13148)

Greening the Government through Leadership in Environmental Management (EO 13148) dated 21 April 2000 directs federal government to ensure that all necessary actions are taken to integrate environmental accountability into agency day-to-day decision-making and long-term planning processes, across all agency missions, activities, and functions. Environmental management considerations must be a fundamental and integral component of federal government policies, operations, planning and management.

This EO mandates environmental compliance audit programs and policies that emphasize pollution prevention as a means to both achieve and maintain environmental compliance. It also requires reductions in use by the federal government in toxic chemicals, hazardous materials, ozone-depleting substances, and other pollutants. Section 207 requires environmentally and economically beneficial landscaping. Each agency shall strive to promote the sustainable management of federal facility lands through the implementation of cost-effective, environmentally sound landscaping practices, and programs to reduce adverse impacts to the natural environment. This EO supersedes EO 12902, "Energy Efficiency and Water Conservation at Federal Facilities" of 08 March 1994.

Greening the Government through Waste Prevention, Recycling, and Federal Acquisition (EO 13101)

Greening the Government through Waste Prevention, Recycling, and Federal Acquisition (EO 13101) dated 14 September 1998 directs the head of each executive agency to incorporate waste prevention and recycling in the agency's daily operations and work to increase and expand markets for recovered materials through greater federal government preference and demand for such products. It is the national policy to prefer pollution prevention, whenever feasible. Pollution that cannot be prevented should be recycled; pollution that cannot be prevented or recycled should be treated in an environmentally safe manner. Disposal should be employed only as a last resort.

Protection and Enhancement of Environmental Quality (EO 11514, 07 March 1970 (35 CFR 4247) and EO 11991)

Protection and Enhancement of Environmental Quality (EO 11514) directs issuance of instructions and guidelines relative to preparation of environmental impacts. This order created the CEQ to oversee the implementation of NEPA, mediate disputes and develop environmental policy.

Protection and Enhancement of Environmental Quality (EO 11991) amends EO 11514 (05 March 1970) to require CEQ to issue regulations to make environmental impact statements more effective.

Strengthening Federal Environmental, Energy, and Transportation Management (EO 13423)

Executive Order 13423 "Strengthening Federal Environmental, Energy, and Transportation Management" (24 January 2007) required each USDOD component to adopt an EMS. An EMS is a formal management framework that provides a systematic way to review and improve operations, create awareness, and improve environmental performance. Systematic environmental management as an integral part of day-to-day decision making and long-term planning processes is an important step in supporting mission readiness and effective use of resources. The most significant resource for every organization is their senior leadership's commitment and visibility in EMS implementation and sustainability. A robust EMS is essential to sustaining compliance, reducing pollution and minimizing risk to mission. The Navy's EMS has a concerted focus on preventing pollution, consistent regulatory compliance, and reducing environmental impacts, including environmental practice for energy and transportation functions, using "plan-do-check-act" management model (OPNAVINST 5090.1C 30 October 2007). It conforms to the ISO 14001:2004 EMS standard.

B.2.1.2 Terrestrial and Aquatic Habitat Executive Orders

Floodplain Management (EO 11988), 24 May 1977, (42 FR 26951)

This EO states that executive agencies will preserve the natural and beneficial values served by floodplains while managing federal lands. Activities in floodplains must be evaluated for their impacts during project planning, and alternative sites outside the floodplain must be considered. This order includes wetlands that are within the 100-year floodplain and especially discourages filling.

Marine Protected Areas (EO 13158), 26 May 2000, (65 FR 34909)

Executive Order 13158 "Marine Protected Areas," requires each federal agency whose authorities provide for the establishment or management of MPAs to take appropriate actions to enhance or expand protection of existing MPAs and establish or recommend, as appropriate, new MPAs. To the extent permitted by law and subject to the availability of appropriations, the U.S. Department of Commerce (USDOC) and USDOI, in consultation with USDOD, U.S. Department of State, U.S. Agency for International Development, U.S. Department of Transportation, EPA, the National Science Foundation, and other pertinent federal agencies shall develop a national system of MPAs. These pertinent federal agencies will coordinate and share information, tools,

and strategies, and provide guidance to enable and encourage the use of the following in the exercise of each agency's respective authorities to further enhance and expand protection of existing MPAs and to establish or recommend new MPAs, as appropriate:

1. Science based identification and prioritization of natural and cultural resources for additional protection;
2. Integrated assessments of ecological linkages among MPAs, including ecological reserves in which consumptive uses of resources are prohibited, to provide synergistic benefits;
3. A biological assessment of the minimum area where consumptive uses would be prohibited that is necessary to preserve representative habitats in different geographic areas of the marine environment;
4. An assessment of threats and gaps in levels of protection currently afforded to natural and cultural resources, as appropriate;
5. Practical, science based criteria and protocols for monitoring and evaluating the effectiveness of MPAs;
6. Identification of emerging threats and user conflicts affecting MPAs and appropriate, practical, and equitable management solutions, including effective enforcement strategies, to eliminate or reduce such threats and conflicts;
7. Assessment of the economic effects of the preferred management solutions; and
8. Identification of opportunities to improve linkages with, and technical assistance to, international marine protected area programs.

Off-Road Vehicles on Public Lands (EO 11989)

The ORVs on Public Lands EO (EO 11989) provides for closing areas to use where soil, wildlife, or other resources are adversely affected. Amends EO 11644 by exempting fire, military, emergency, law enforcement, or combat/combat support vehicles.

Protection of Wetlands (EO 11990), 24 May 1977, (42 FR 26961)

Executive Order 11990 "Protection of Wetlands," requires federal agencies to provide leadership and take action to minimize the destruction, loss or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands when:

- Acquiring, managing, and relinquishing of federal lands and facilities;
- Providing federally undertaken, financed, or assisted construction and improvements; and
- Conducting federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulating, and licensing activities.

Since the issuance of this EO, the focus of national policy has shifted from "minimizing" destruction, loss, and degradation of wetlands to "no net loss" of wetlands in carrying out the above federal activities.

B.2.1.3 Wildlife Population Executive Orders

Migratory Birds (EO 13186)

The Migratory Birds EO (EO 13186) issued 10 January 2001 directs executive departments to take certain actions regarding the protection of migratory birds. Among these actions is the development and implementation of a MOU with the USFWS within two years of the EO on the protection and conservation of migratory birds. The USDOD is currently developing a MOU with 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."

B.2.1.4 Species of Concern Executive Orders

Environmental Safeguard for Animal Damage Control on Federal Lands (EO 12342), 27 January 1982, (47 CFR 4223)

Environmental Safeguard for Animal Damage Control on Federal Lands (EO 12342) restricts the use of chemical toxicants for mammal and bird control.

Invasive Species (EO 13112), 03 February 1999, (64 CFR 6183)

Executive Order 13112 defines an invasive species as "an alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health" (NISC 2008). The definition includes many types of invasive species such as animals, plants, and microorganisms. It focuses upon invasive species which are harmful, rather than focusing on non-native species, most of which are not harmful.

EO 13112 established the National Invasive Species Council (NISC). NISC members include the Secretaries of Defense, State, Transportation, Homeland Security, Treasury, and Health and Human Services; the Administrators of EPA and the National Aeronautics and Space Administration; as well as the Director of the U.S. Agency for International Development and the U.S. Trade Representative.

Federal activities are now coordinated through NISC (established by the executive order) and the Aquatic Nuisance Species (ANS) Task Force. The ANS Task Force was established by the NANCPA of 1990 and the NISA of 1996. The NANCPA established a federal framework that promotes and coordinates research to assist state governments. NANCPA develops and applies prevention and control strategies, establishes national priorities, educates and informs citizens, and coordinates public programs. The act calls upon states to develop and implement comprehensive state management plans to prevent introduction and control the spread of aquatic nuisance species.

The 1996 NISA amended NANCPA to mandate ballast water exchange for all vessels with ballast on board that enter U.S. waters from the outside the EEZ. NISA required vessels to submit a report form to the USCG documenting specific ballast water management practices. After voluntary guidelines proved unsatisfactory, the USCG made compliance with ballast exchange guidelines mandatory in 2004. NISA authorized funding for research on aquatic nuisance species prevention and control. In addition, NISA required a ballast water management program to demonstrate technologies and practices to prevent aquatic non-indigenous species from being introduced into and spread through ballast water in U.S. waters. The mandatory program requires ships to use one of three ballast water management methods: (1) retaining ballast water on board, (2) conducting a mid-ocean exchange, and/or (3) using an approved ballast water treatment method. All vessels are required to submit ballast water management reports (failure to submit a report can now result in penalties). Federal regulations also require vessels to maintain a ballast water management plan that is specific for that vessel and assigns responsibility to the master or appropriate official to understand and execute the ballast water management strategy for that vessel.

To help coordinate NISC and the ANS Task Force, the USDOC Policy Liaison to NISC also serves as the USDOC representative to the ANS Task Force. In addition, NISC and the ANS Task Force have formed joint working groups on each of the following topics: pathways, risk analysis and screening. The task force and the species council are similar in that they perform coordinating functions but different in their responsibilities: NISC focuses on all invasive species while the ANS Task Force focuses on aquatic invasive species. Although many of the same principles apply to managing aquatic and terrestrial invasive species, many management issues are unique to the aquatic environment and need to be addressed separately.

The goal of the NISC is to provide coordination, planning, and leadership for federal invasive species programs that support state, tribal, local, and private entities. To meet this goal, in 2001 the National Invasive Species Monitoring Plan (NISMP) was developed. The 2008-2012 NISMP is the first revision of the 2001 Plan, as mandated by EO 13112. This 2008-2012 NISMP directs federal efforts (including overall strategy and objectives) to prevent, control, and minimize invasive species and their impacts within a five year period. If necessary, it may be updated more frequently to reflect changes in circumstances, agency plans, and priorities. The 2008-2012 NISMP focuses on five strategic goals (NISC 2008):

- Prevention - preventing introduction & establishment of invasive species
- Early Detection and Rapid Response - a crucial secondary line of defense
- Control and Management - containing and reducing the spread of invasive populations
- Restoration - restore high-value ecosystems across scales
- Organizational Collaboration - maximize collaboration efforts among federal, state, local, tribal, and private groups

To accomplish these strategic goals, critical support for efforts such as research, data and information management, education and outreach, and cooperation are included in pertinent sections of the NISC 2008-2012 NISMP.

The USDOD has been tasked to act as a participant in various performance elements that support each of the five strategic goals discussed in the NISC 2008-2012 NISMP. These strategic goals, objectives, implementation tasks, and performance elements are applicable to both terrestrial and aquatic invasive species. Within the context of the SNI INRMP, the performance elements, that task the USDOD as a participant, and the implementation task and objectives that they support are identified in *Section 4.6: Invasive Exotic Species* as management strategies to address invasive species generally. These management strategies to support invasive species efforts have been modified from the federal guidance to specifically address SNI.

B.2.1.5 Executive Orders Relevant to Cultural Resources

Indian Sacred Sites (EO 13007), 29 May 1996, (61 CFR 26771)

Indian Sacred Sites (EO 13007) provides for the protection of and access to Indian sacred sites.

Protection and Enhancement of the Cultural Environment (EO 11593), 13 May 1971, (36 CFR 8921)

Protection and Enhancement of the Cultural Environment (EO 11503) directs federal agencies to take a leadership role in preserving, restoring, and maintaining the historic and cultural environment of the nation. Federal agencies must locate, inventory, and nominate to the NRHP all historic resources under their jurisdiction or control. Until these processes are completed, agency heads must exercise caution to ensure that potentially qualified federal property is not inadvertently transferred, sold, demolished, or substantially altered. When planning projects, agencies are urged to request the opinion of the Secretary of the Interior as to the eligibility for NRHP listing of properties whose resource value is questionable or has not been inventoried. Agencies are directed to institute procedures, in consultation with the President's Advisory Council on Historic Preservation, to ensure that federal plans and programs contribute to the preservation and enhancement of non-federally owned historic resources. Protection of NRHP historic and archaeological sources is achieved by the Marine Corps through implementation of the Historic and Archeological Resources Protection Plan. The plan facilitates compliance by providing management goals, priorities, and standard operating procedures for site protection.

B.3 Federal Regulations, Directives, and Instructions

B.3.1 Federal Regulations

10 CFR 436. Federal Emergency Management and Planning Programs.

15 CFR 923. NOAA Coastal Zone Management Program Development and Approval Regulation.

15 CFR 930. Federal Consistency with Approved Coastal Management Programs.

15 CFR 990. NOAA Regulations on Natural Resource Damage Assessments.

18 CFR 1312. Archeological Resource Protection Act Regulations.

29 CFR 1910. Occupational Safety and Health Standards.

29 CFR 1910.1200. Hazard Communication Standard.

29 CFR 1910.120. Hazardous Waste and Emergency Response.

32 CFR 172. USDOD Regulations for the Disposition of Proceeds from Sales of Surplus Property.

32 CFR 188. Environmental Effects in the U.S. of USDOD Actions.

32 CFR 190. Natural Resources Management Program.

32 CFR 229. Protection of Archeological Resources: Uniform Regulations.

32 CFR 650. Environmental Effects Abroad of Major Federal Actions - Environmental Protection and Enhancement: Subpart H, Historic Preservation.

32 CFR 775. Procedures for Implementing NEPA. USDON policy to supplement USDOD regulations (32 CFR 214) by providing policy and assigning responsibilities to the Navy and Marine Corps for implementing CEQ regulations and implementing NEPA.

33 CFR 154. Oil Pollution Prevention Regulations for Marine Oil Transfer Facilities.

33 CFR 156. USCG Regulations for Universal Waste Management Standards.

33 CFR 320-330. Regulatory Programs of the USACE.

33 CFR 330. Dredge and Fill Nationwide Permit Program.

36 CFR 60. NRHP.

36 CFR 63. Determination of Eligibility for Inclusion in the NRHP.

36 CFR 65. National Historic Landmarks Program.

36 CFR 67. Historic Preservation Certificates.

36 CFR 68. The Secretary of Interior's Standards for Historic Preservation Projects.

36 CFR 78. Waiver of Federal Agency Responsibility under Section 110 of the NHPA.

36 CFR 79. Curation of Federally Owned and Administered Archeological Collections.

36 CFR 800. NHPA Regulations for the Protection of Historic Properties.

40 CFR 6. EPA Regulations on Implementation of NEPA Procedures.

40 CFR 7. Archeological Resources Protection Act of 1979; Uniform Regulations.

40 CFR 50. EPA Regulations on National Primary and Secondary Ambient Air Quality Standards.

40 CFR 51-52. EPA Requirements for Preparation, Adoption, Submittal, Approval, and Promulgation of Implementation Plans.

40 CFR 53. EPA Regulations for Ambient Air Monitoring Reference and Equivalent Methods.

40 CFR 55. Outer Continental Shelf Air Regulations.

40 CFR 56. EPA Regulations on Regional Consistency under the Clean Air Act.

40 CFR 58. EPA Ambient Air Quality Surveillance Regulations.

40 CFR 60. EPA Regulations on New Source Performance Standards.

40 CFR 61. National Emissions Standards for Hazardous Air Pollutants.

40 CFR 62. EPA Regulations on state Plans for Designated Facilities and Pollutants.

40 CFR 65. EPA Regulations on Delayed Compliance Orders under the Clean Air Act.

40 CFR 66. EPA Regulations for Assessment and Collection of Noncompliance Penalties.

40 CFR 68. Chemical Accident Prevention Provisions.

40 CFR 69. EPA Special Exemptions from Requirements of the Clean Air Act.

40 CFR 70. State Operating Permit Programs.

40 CFR 80. Regulation of Fuels and Fuel Additives.

40 CFR 81. EPA Regulations Designating Areas for Air Quality Planning.

40 CFR 82. EPA Stratospheric Ozone Protection Regulations.

40 CFR 86. Control of Air Pollution from New and In-Use Motor Vehicle Engines: Certification and Test Procedures.

40 CFR 87. EPA Regulations on Control of Air Pollution and Aircraft and Aircraft Engines.

40 CFR 104. EPA Regulations on Public Hearings on Effluent Standards for Toxic Pollutants.

40 CFR 109. EPA Regulations on Criteria for state, Local, and Regional Oil Removal Contingency Plans.

40 CFR 110. EPA Regulations on Discharge of Oil.

40 CFR 112. EPA Regulations on Oil Pollution Prevention.

40 CFR 113. EPA Regulations on Liability for Small Onshore Oil Storage Facilities.

40 CFR 116-117. EPA Regulations on Hazardous Substances.

40 CFR 122. EPA NPDES Permit Regulations.

40 CFR 125. EPA Regulations on Criteria and Standards for the NPDES.

40 CFR 129. EPA Toxic Pollutant Effluent Standard.

40 CFR 130. EPA Requirements for Water Quality Planning and Management.

40 CFR 141-143. EPA National Drinking Water Regulations.

40 CFR 148. EPA Regulations on Hazardous Waste Disposal Restrictions for Class I Wells.

40 CFR 150-186. EPA Regulations for Pesticide Programs.

40 CFR 162. EPA Regulations on Insecticide, Fungicide, and Rodenticide Use.

40 CFR 220, 227. Ocean Dumping Regulations and Criteria.

40 CFR 230. UEPA Interim Regulations on Discharge of Dredged or Fill Material into Navigable Waters.

40 CFR 231. EPA Regulations on Disposal Site Determination under the CWA.

40 CFR 240-241. EPA Guidelines for Thermal Processing of Solid Wastes and for the Land Disposal of Solid Wastes.

40 CFR 243. EPA Guidelines for Solid Waste Storage and Collection.

40 CFR 244. EPA Guidelines for Solid Waste Management of Beverage Containers.

40 CFR 245. EPA Guidelines for Resource Recovery Facilities.

40 CFR 246. EPA Guidelines for Source Separation for Materials Recovery.

40 CFR 247. EPA Guidelines for Procurement of Products that Contain Recycled Materials.

40 CFR 248. EPA Guidelines for Federal Procurement of Building Insulation Products Containing Recovered Materials.

40 CFR 249. EPA Guidelines for Federal Procurement of Cement and Concrete Containing Fly Ash.

40 CFR 250. EPA Guidelines for Federal Procurement of Paper and Paper Products Containing Recovered Materials.

40 CFR 252. EPA Guidelines for Federal Procurement of Lubricating Oils Containing Re-fined Oil.

40 CFR 253. EPA Guidelines for Federal Procurement of Retread Tires.

40 CFR 255. EPA Guidelines for Identification of Regions and Agencies for Solid Waste Management.

40 CFR 257. EPA Regulations on Criteria for Classification of Solid Waste Disposal Facilities and Practices.

40 CFR 259. EPA Medical Waste Regulations.

40 CFR 260-270. EPA Regulations Implementing the RCRA.

40 CFR 262. EPA Regulations for Hazardous Waste Generators.

40 CFR 264. EPA Regulations for Owners and Operators of Permitted Hazardous Waste Facilities.

40 CFR 268. EPA Regulations on Land Disposal Restrictions.

40 CFR 273. EPA Regulations for Universal Waste Management Standards.

40 CFR 279. Used Oil Management Standards.

40 CFR 280. Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks.

40 CFR 300. National Oil and Hazardous Substances Pollution.

40 CFR 300.600. National Oil and Hazardous Substances Pollution Contingency Plan, Designation of Federal Trustees.

40 CFR 300.615. Responsibilities of Trustees.

40 CFR 302. EPA Designation, Reportable Quantities, and Notification Requirements for Hazardous Substances under CERCLA.

40 CFR 355. EPA Regulations for Emergency Planning and Notification under CERCLA.

40 CFR 370. EPA Hazardous Chemical Reporting and Community Right-to-Know Requirements.

40 CFR 372. EPA Toxic Chemical Release Reporting Regulations.

40 CFR 373. EPA Regulations for Real Property Transactions under CERCLA.

40 CFR 403. General Pretreatment Regulations for Existing and New Sources of Pollution.

40 CFR 413. EPA Effluent Guidelines and Standards for Electroplating.

40 CFR 414. EPA Effluent Guidelines and Standards for Organic Chemicals.

40 CFR 415. EPA Guidelines and Standards for Inorganic Chemicals.

40 CFR 417. EPA Effluent Guidelines and Standards for Soaps and Detergents.

40 CFR 433. EPA Effluent Guidelines and Standards for Metal Finishing.

40 CFR 504. State Sludge Management Programs and Regulations.

40 CFR 760-761. EPA Regulations for Controlling Polychlorinated Biphenyls.

40 CFR 1500-1508. CEQ Regulations on Implementing NEPA Procedures.

41 CFR 41-47. Disposal Regulations.

43 CFR 3. Preservation of American Antiquities.

43 CFR 7. Archaeological Resources Protection Act of 1979; Uniform Regulations.

43 CFR 10. Native American Graves Protection and Repatriation Act Regulations.

43 CFR 11. USDOI Regulations on Natural Resource Damage Assessments.

49 CFR 100-199. Department of Transportation Hazardous Materials Regulations.

49 CFR 126. Pesticide Transportation.

49 CFR 194. Oil Pollution Prevention Regulations for Onshore Pipelines.

50 CFR 10. General Provision and Statutes Administered by the USFWS.

50 CFR 10.13. List of Migratory Birds.

50 CFR 18, 216, 218. Regulations Concerning Marine Mammals.

50 CFR 17.11 and 17.12. USFWS List of Endangered and Threatened Wildlife.

50 CFR 402. Interagency Cooperation - ESA of 1973 as amended.

B.3.2 Federal Register Documentation

74 FR 59443. Federal List of Endangered and Threatened Wildlife.

B.3.3 Department of the Interior Fish and Wildlife Service Memoranda

USFWS Memorandum to Regional Directors, Regions 1-8, Delegation of INRMP Concurrence Authority. 12 June 2009

B.3.4 Department of Defense Directives, Instructions, and Memorandums

U.S. Department of Defense Instruction 4150.7. (29 May 08) USDOD Pest Management Program

U.S Department of Defense Instruction 4700.4. (24 January 89) Natural Resources Management Program

U.S. Department of Defense Instruction 4715.3. (03 May 96) Natural Resources Management

USDODINST 4715.3 implements policy, assigns responsibilities, and prescribes procedures for the integrated management of natural and cultural resources on property under military control. The instruction states that “all USDOD conservation programs shall work to guarantee continued access to [USDOD] land, air, and water resources for realistic military training and testing while ensuring that the natural and cultural resources entrusted to USDOD care are sustained in a healthy condition for scientific research, education, and other compatible uses by future generations” (USDOD 1996).

USDODINST 4715.3 also designates USDOD executive agents to lead the military services in implementing key conservation issues, including preparing, maintaining, and monitoring INRMPs on all military installations. The instruction notes that conservation management is a dynamic process yet prescribes that a consistent conservation management approach include those systematic procedures that should be used by each USDOD installation, as follows:

- Assess military mission
- Prepare detailed inventory of resources
- Analyze and assess risk to the resources
- Prepare and implement management plans
- Monitor and assess results
- Conduct needs assessment survey
- Reassess inventories
- Reanalyze and reassess risk to resources
- Adjust program as necessary

U.S Department of Defense Instruction 4715.4. (18 June 96) Pollution Prevention

U.S Department of Defense Instruction 4715.9. (03 May 96) Environmental Planning and Analysis

U.S. Department of Defense Instruction 4715.16. (18 September 08) Cultural Resources Management

USDODINST 4715.16 establishes USDOD policy and assigns responsibilities under the authority of USDODDIR 5134.01, "Under Secretary of Defense for Acquisition, Technology, and Logistics" (9 December 2005), and in accordance with USDODDIR 4715.1E, "Environment, Safety, and Occupational Health" (19 March 2005), to comply with applicable federal statutory and regulatory requirements, EOs, and Presidential memorandums for the integrated management of cultural resources on USDOD managed lands (USDOD 2008).

Instruction 4715.6 establishes USDOD cultural resources management policy to (USDOD 2008):

- Manage and maintain cultural resources under USDOD control in a sustainable manner through a comprehensive program that considers the preservation of historic, archaeological, architectural, and cultural values; is mission supporting; and results in sound and responsible stewardship.
- Be an international and national leader in the stewardship of cultural resources by promoting and interpreting the cultural resources it manages to inspire USDOD personnel and to encourage and maintain U.S. public support for its military.
- Consult in good faith with internal and external stakeholders and promote partnerships to manage and maintain cultural resources by developing and fostering positive partnerships with federal, tribal, state, and local government agencies; professional and advocacy organizations; and the general public.

U.S Department of Defense Instruction 6055.6. (10 October 00) USDOD Fire and Emergency Services Program

U.S Department of Defense Instruction 5000.13. (13 December 76) Natural Resources: The Secretary of Defense Natural Resources Conservation Award.

USDODDIR 4001.1. (04 September 86). Installation Management.

USDODDIR 4140.1 (04 January 93). Material Management Policy.

USDODDIR 4150.7 (24 October 83). USDOD Pest Management Program.

USDODDIR 4165.57 (08 November 77). Air Installations Compatible Use Zones.

USDODDIR 4165.59 (29 December 75). USDOD Implementation of the Coastal Zone Management Act.

USDODDIR 4165.60 (27 July 89). Hazardous Material Pollution.

USDODDIR 4165.60 (04 October 76). Solid Waste Management - Collection, Disposal, Resource Recovery, and Recycling Program.

USDODDIR 4165.61 (09 August 93). Intergovernmental Coordination of USDOD Federal Development Programs and Activities.

USDODDIR 4700.1 (06 November 78). Natural Resources Conservation and Management. Provides for management of renewable natural resources on military lands.

USDODDIR 4700.2 (15 July 88). Secretary of Defense Award for Natural Resources and Environmental Management.

USDODDIR 4700.4 (24 January 89). Natural Resources Management Program.

USDODDIR 4705.1 (09 July 92). Management of Land-based Water Resources in Support of Joint Contingency Operations.

USDODDIR 4710.1 (21 June 84). Archeological and Historic Resources Management. Establishes policies, procedures, and assigns responsibilities for the management of archeological and historic resources located in and on waters and lands under USDOD control. This Directive implements these guidelines consistent with federal law, Executive orders, and other USDOD directives that deal with archeological and historic preservation issues.

4715.DD-R (April 96). Draft Integrated Natural Resources Management in USDOD.

USDODDIR 4715.1 (24 February 96). Environmental Security.

USDODDIR 4715.2 (03 May 96). USDOD Regional Environmental Coordination.

USDODDIR 4715.3 (03 May 96). Environmental Conservation Program.

USDODDIR 4715.4 (18 June 96). Pollution Prevention.

USDODDIR 4715.5 (22 April 96). Management of Environmental Compliance at Overseas Installations.

USDODDIR 4715.6 (24 April 96). Environmental Compliance.

USDODDIR 4715.7 (22 April 96). Environmental Restoration Program.

USDODDIR 4715.8 (02 February 98). Environmental Education Training and Career Development.

USDODDIR 4715.9 (03 May 96). Environmental Planning and Analysis.

USDODDIR 4715.10 (24 April 96). Environmental Education Training and Career Development.

USDODDIR 4715.11 (17 August 99). Environmental and Explosive Safety Management on Department of Defense Active and Inactive Ranges within the United States.

USDODDIR 4715.12 (19 August 99). Environmental and Explosive Safety Management on USDOD Active and Inactive Ranges Outside the United States.

USDODDIR 5030.41 (01 June 77). Oil and Hazardous Substances Pollution Prevention and Contingency Program.

USDODDIR 6050.1 (30 July 79). Environmental Effects in the U.S. of USDOD Actions.

USDODDIR 6050.2 (19 April 79). Use of Off-Road Vehicles on USDOD Lands. Provides policy for use of off-road vehicles on USDOD lands.

USDODDIR 6050.4 (16 March 82). Marine Sanitation Devices for Vessels Owned or Operated by USDOD.

USDODDIR 6050.5 (29 October 90). USDOD Hazard Communication Program.

USDODDIR 6050.7 (31 March 79). Environmental Effects Abroad of Major USDOD Actions.

USDODDIR 6050.8 (27 February 86). Storage and Disposal of Non-USDOD Owned Hazardous or Toxic Materials on USDOD Installations.

USDODDIR 6050.10 (20 September 91). USDOD Policy for Establishing and Implementing Environmental Standards at Overseas Installations.

USDODDIR 6050.15 (14 June 85). Prevention of Oil Pollution from Ships Owned or Operated by USDOD.

USDODDIR 6050.16 of 20 September 1991. USDOD Policy for Establishing and Implementing Environmental Standards at Overseas Installation.

USDODDIR 7000.14-R (18 March 93). USDOD Financial Management Regulations.

Deputy Under Secretary of Defense (Installations and Environment) Memorandum, 10 October 2002. Implementation of SAIA: Updated Guidance with Attachment. The DUSD (I&E) Memorandum, 10 October 2002, improved coordination external to USDOD (USFWS, state agencies, and the public) and internal to USDOD (military operators and trainers, cultural resources managers, pest managers). It also added new tracking procedures, called metrics, to ensure proper INRMP coordination occurred and that projects were implemented.

Assistant Deputy Undersecretary of Defense (ADUSD) for Environment, Safety and Occupational Health (ESOH) Policy (01 November 2004 Memo). The Supplemental USDOD INRMP Guidance (01 November 2004 Memo) further defined the scope of the annual and five-year review, public comment on INRMP reviews, and ESA consultation. A formal review must be performed by "the parties" at least every five years. Informal annual reviews are mandatory to facilitate adaptive management, during which INRMP goals, objectives, and "must fund" projects are reviewed, and a realistic schedule established to undertake proposed actions. The outcome of this joint review should be documented in a memorandum or letter summarizing the rationale for the conclusions the parties have reached. This written documentation should be jointly executed or in some other way reflect the parties' mutual agreement.

Office of the Under Secretary of Defense Memorandum for Deputy Assistant Secretary of the Army (Environment, Safety and Occupational Health), Deputy Assistant Secretary of the Navy (Environment), Deputy Assistant Secretary of the Air Force (Environment, Safety, and Occupational Health), Director Defense Logistics Agency. Implementation of Sikes Act Improvement Amendments: Supplemental Guidance concerning Leased Lands. 17 May 2005. This Memorandum provides supplemental guidance for Implementing Sikes Act Improvement Amendments requirements consistently throughout the USDOD. It adds implementing guidance dated 10 October 2002 and 01 November 2004 same subject. The guidance covers lands occupied by tenants or lessees or being used by others pursuant to a permit, license, right of way, or any other form of permission.

Office of the Under Secretary of Defense Memorandum for Deputy Assistant Secretary of the Army (Environment, Safety and Occupational Health), Deputy Assistant Secretary of the Navy (Environment), Deputy Assistant Secretary of the Air Force (Environment, Safety, and Occupational Health), Director Defense Logistics Agency. Integrated Natural Resource Management Plan (INRMP) Template. 14 August 2006.

Memorandum of Understanding Among The U.S. Department of Defense and The U.S. Fish and Wildlife Service and The International Association of Fish and Wildlife Agencies for a Cooperative Integrated Natural Resource Management Program on Military Installations. 31 January 2006.

Memorandum of Understanding to Promote the Conservation of Migratory Birds between the U.S. Fish and Wildlife Service and the U.S. Department of Defense in Accordance with Executive Order 13186. Prepared by the Under Secretary of Defense for Acquisition, Technology, and Logistics in April 2007.

B.3.5 Department of the Navy Manuals, Instructions, and Guidance

SECNAVINST 4000.35. (17 August 92) (NOTAL). Department of the Navy Cultural Resources Program.

SECNAVINST 5090.8 (18 December 00) (DASN[I&E]). Policy for Environmental Protection, Natural Resources, and Cultural Resources Program.

SECNAVINST 6240.6E (18 December 00). Implementation of USDOD directives under USDODINST 4700.4.

SECNAVINST 6401-1A (16 August 94). Veterinary Health Services.

OPNAVINST 5090.1C (30 October 07)

The Navy's Environmental Protection and Natural Resources Manual, termed OPNAVINST 5090.1C, requires that each Navy installation containing natural resources prepare a multiple-use natural resources management plan. OPNAVINST 5090.1C specifically states that the conservation of natural resources and the military mission need not and shall not be mutually exclusive. OPNAVINST 5090.1C, Chapter 24 - Natural Resources Management, establishes Navy program requirements for ensuring military readiness and sustainability while complying with natural resource protection laws, and conserving and managing natural resources in the U.S., its territories, and possessions for both appropriated and non-appropriated fund activities (USDON 2007). This dual dynamic of Stewardship and Readiness is essential for the long-term maintenance of military and natural resources sustainability (USDON 2007). Navy commands shall accomplish the following when managing natural resources on Navy lands:

- Assign specific responsibility, provide centralized supervision, assign professionally trained personnel to the natural resources management program, and provide natural resources personnel with the opportunity to participate in natural resources management job training activities and professional meetings;
- Protect, conserve, and manage the watersheds, wetlands, natural landscapes, soils, forests, fish and wildlife, prime and unique farmland, and other natural resources as vital elements of an optimum natural resources program;
- Manage natural resources to provide outdoor recreation opportunities;
- Use and care for natural resources in the combination best serving the present and future needs of the U.S.;
- Provide for the optimum use of land and water areas and access thereto while maintaining ecological integrity; and
- Interact with the surrounding community to develop positive and productive community involvement, participation, and educational opportunities.

OPNAVINST 5750.13 (10 November 75). Historical Properties of the Navy.

OPNAVINST 6250.4B (27 August 98). Pest Management Programs. Requires Navy and Marine Corps to have a comprehensive Pest Management Plan. Discusses the need to control pest outbreaks which affect the military mission, damage property, or impact the welfare of people.

OPNAVINST 8000.16. Environmental Security Management.

OPNAVINST 8026.2A (15 June 00). Navy Munitions Disposition Policy.

OPNAVINST 11000.17 (17 September 99). National Preservation Act Consultations Related to Base Realignment and Closure Actions.

OPNAVINST 11010.20F (07 June 96). Facilities Projects Manual.

NAVFAC P-73 (May 87) Real Estate Procedure Manual, Volumes I and II; and Natural Resources Management Procedure Manual, Chapter 2 - Integrated Natural Resources Management Plans

The Navy's Real Estate Manual, referred to as NAVFAC P-73, addresses all CNO natural resources program requirements, guidelines, and standards (USDON 2009). NAVFAC P-73 states that the principles of multiple-use, ecosystem, and adaptive management shall be implemented on Navy facilities that meet the natural resources stipulations outlined in OPNAVINST 5090.1C (discussed above). The manual provides guidance to Navy environmental personnel on the purpose of and need for INRMPs by outlining that the wise use of natural resources is essential to the continuation of the military mission. NAVFAC P-73 Chapter 2 - Integrated Natural Resources Management Plans requires that the following tasks be undertaken to meet the natural resources program objectives:

- Prepare, implement, and maintain, as a current working document, an INRMP for all Navy lands that have suitable habitat for conserving and managing natural resources. Each plan must adequately facilitate mission planning and decision-making to ensure compatibility of natural resources management with local, state, and federal objectives and policies.
- Implement land management practices that reduce grounds maintenance costs, use environmentally and economically beneficial landscaping practices, conserve soil and water, improve real estate values, protect coastal zones, wetlands, and floodplains, abate non point sources of water pollution, control noxious weeds, and prevent erosion.
- Inventory wetlands and manage Navy land to avoid the net loss of size, function, or value of wetlands.
- Identify and protect federally threatened and endangered species on Navy lands, emphasizing mission requirements and interagency cooperation during consultation, species recovery planning, and management activities.
- Outlease all lands that are suitable and available for agricultural uses, consistent with operational requirements and long-term ecosystem management goals.
- Reduce the potential for bird and other animal collisions with aircraft in the airfield environment.
- Manage fish, wildlife, and plant resources within ecological limits, maintain appropriate wildlife population levels, and support optimum use of consumptive and nonconsumptive fish and wildlife resources.

NAVFACINST 6250.3H. Applied Biology Program Services and Training. Requires the use of an integrated pest management approach to minimize the use of herbicides.

NAVFACINST 11010.45 (30 June 02). Comprehensive Regional Planning Instruction (Land Use Module/RSIP Links)

NAVFACINST 11012.111A. Land Use Conservation Planning.

NAVFACINST MO-100.4. Guidance on Special Interest Areas.

Office of the Assistant Secretary (Installations and Environment) Memorandum for Commander Navy Installations Command (N45), Director Environmental Readiness Division (N45), Director Facilities and Services Division (CMC-LFL). Department of the Navy Natural Resources Program Metrics. 22 August 2006.

Chief of Naval Operations (N45) Integrated Natural Resources Management Plan (INRMP) Guidance 10 April 2006 (5090 N456K/6U838101). The INRMP Guidance was developed to provide natural resource managers at Navy installations with information necessary to prepare, update, and implement INRMPs. the Guidance was revised in close coordination with natural resources staff from Commander, Navy Installation Command and Commander, Naval Facilities Engineering Command. This guidance builds upon previous Navy INRMP guidance and incorporates requirements contained in the DUSD (I&E) Memorandum, dated October 10 2002, which promulgates new USDOD SAIA guidance, and other relevant USDOD guidance.

CNO (N45) Policy Letter Preventing Feral Cat and Dog Populations on

Navy Property 10 January 2002 (5090 Ser N456M/1U595820)

CNO (N45) Navy Environmental Management System (EMS) Policy 06 December 2001 (5090 Ser N451G/1U595831)

B.3.6 Naval Base Ventura County Instructions

NBVCINST 11010.1 Site Approval and Project Review Process

The Naval Base Ventura County Instruction 11010.1 Site Approval and Project Review Process established the responsibilities, policies, and procedures associated with obtaining project and site approvals from the Public Works Department, the Project Review Board, and applicable local and/or regional Navy agencies. This Instruction provides a standard project review process for Naval Base Ventura County in compliance with OPNAVINST 5090.1C, OPNAVINST 5100.23F, COMNAVREGSWINST 5100.11D, NBVCINST 11320.1, COMNAVREGSWINST 11010.1, NAVFACINST 11010.45, and NBVCINST 5090.2.

B.4 California State Laws

B.4.1 Water Resource Laws

California Water Code

The California Water Code Section 1243 declares the reservation of water for the enhancement and protection of fish and wildlife to be a beneficial use.

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act (California Water Code §§ 13000 *et seq.*) is the state's primary water law. It gives SWRCB and the nine regional water quality control boards substantial authority to regulate water use.

According to this Act, water quality protection at SNI is the responsibility of the SWRCB and LARWQCB. Authority comes from the state's Porter-Cologne Water Quality Control Act and the federal CWA. With the SWRCB setting statewide water quality objectives, the RWQCB carries out specific aspects of surface and coastal water regulations. Due to the isolation of SNI, limited access, and island operations, potential contaminants of the watershed are limited; however, the LARWQCB has established groundwater quality objectives for SNI.

Implementation of the groundwater quality objectives occurs through the issuance of permits for waste discharges under the NPDES by LARWQCB. Regulations initially focused on controlling "point source" (end-of-pipe) discharges, such as from sewage treatment, industrial, and power plant out falls. With control of point sources improving, emphasis has turned to regulating storm water discharges from various sources through storm drains as well as runoff sources of nonpoint source pollution. As the result of amendments to the CWA (Sec. 402[p]) and to the CZMA (CZARA Sec. 6217), storm drains are being treated as a point source of pollution and are required to come under NPDES permit. Enforcement of NPDES permits by the Los Angeles RWQCB is done when monitoring or another source indicates a violation of permit conditions. Cease and Desist Orders and Cleanup and Abatement Orders along with stiff financial penalties can be issued for noncompliance.

The SWRCB and the RWQCB also have the authority to designate ASBS for the waters of California. Officially, the term ASBS was changed to "State Water Quality Protection Area" on 01 January 2003 as required under Section 36750 of the California Public Resource Code (PRC) (SWRCB 2003). The RWQCB is required to recommend to the SWRCB areas suitable for this designation. The ASBS concept was established through the Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California (Temperature Plan) and the Water

Quality Control Plan for Ocean Waters of California (Ocean Plan). The SWRCB and the RWQCB recognize that most beneficial uses of water resources are to some degree mutually antagonistic, waste discharge requirements can at best provide relative protection for all beneficial water resource uses. The concept of "special biological significance" recognizes that certain biological communities because of their value or fragility deserve very special protection consisting of preservation and maintenance of natural water quality conditions to the extent practicable (SWRCB and RWQCB 1970). The following list describes the means by which the SWRCB and RWQCB may accomplish the goal of preserving and maintaining natural water quality conditions to the extent practicable.

- Discharge of elevated temperature wastes in a manner that would alter water quality conditions from those occurring naturally will be prohibited.
- Discharge of discrete, point source sewage or industrial process wastes in a manner that would alter water quality conditions from those occurring naturally will be prohibited.
- Discharge of waste from nonpoint sources, including but not limited to storm water runoff, silt and urban runoff, will be controlled to the extent practicable. In control programs for waste from nonpoint sources, Regional Boards will give high priority to areas tributary to ASBS.
- The Ocean Plan, and hence the designation of ASBS, is not applicable to vessel wastes, the control of dredging, or the disposal of dredging spoil.
- The staff will advise other agencies to whom the list of designated areas is to be provided that the basis for this action by the SWRCB and the RWQCB is limited to considerations related to protection of marine life from waste discharges.

San Nicolas Island and Begg Rock is designated as ASBS Number 21 within the Los Angeles RWQCB jurisdiction. The designation of SNI as an ASBS provides a degree of protection to various fish and wildlife species through water quality protection. Intertidal resources receive additional protection through the use of closures and restricted access on the Island.

SWRCB Resolution No. 90-105 grants a California Ocean Plan Exception to the U.S. Navy for discharges into the ASBS at its SNI Desalination Facility. For more information regarding the use of this facility and this ASBS Exception refer to *Section 2.1.4.2: Utilities*.

B.4.2 Terrestrial and Aquatic Habitat Laws

California Coastal Act and the Federal CZMA

Coastal land use is also controlled by the state of California. The CCA of 1972, and current as of 2010, implements California's Coastal Zone Management Program as required by the federal CZMA of 1972 and the CZARA (CCC 2010). It regulates public access, recreation, marine resources, land resources, and development within the coastal zone. The CCC oversees the implementation of the CCA. The CCC can concur with or object to a Coastal Consistency Determination or Negative Determination submitted by a federal agency concerning a proposed federal action. The CZMA Section 307 specifically provides that each "federal agency activity within or outside the coastal zone shall be carried out in a manner which is consistent to the maximum extent practicable with the enforceable policies of approved state management programs." The CCC also seeks to ensure that local governments within the coastal zone prepare an adequate local coastal plan (LCP) based on the California Coastal Management Plan. Once an LCP is certified by the CCC, the local government can issue its own development permits for most projects. The CCC has regulatory control over federal activities in the federal Outer Continental Shelf that affect the state's ocean and coastal resources.

For federal lands, all lands that are held in trust by or which uses are subject solely to the discretion of the federal government, are excluded from California's coastal zone. Most Navy projects are reviewed on a case-by-case basis with no specific criteria established to identify which types of Navy activities have no effect on the coastal zone and, therefore, do not require review for federal consistency. A Negative Determination, usually done on a case-by-case basis, avoids formal review.

Projects can get this determination if:

- The project clearly has no impact on the coastal zone; or
- The project is clearly similar to another project that was previously determined by the CCC to have no impact.

Projects that could fall under the "no impact" category can often be determined using the "common sense" rule, which means "if in doubt, ask" the CCC if a similar project has been determined to have no impact, or if in their view the project would clearly have no impact.

California Ocean Protection Act

In 2004, the legislature approved and the Governor signed the California Ocean Protection Act (Stats. 2004, Chapter 719). One purpose of the California Ocean Protection Act is to coordinate activities of state agencies that are charged with the protection and conservation of coastal waters and ocean ecosystems in order to improve their effectiveness within existing fiscal limitations (CDFG 2008). The legislation identifies the following objectives:

- Provide a set of guiding principles for all state agencies to follow, consistent with existing law, in protecting the state's coastal and ocean resources.
- Encourage cooperative management with federal agencies to protect and conserve representative coastal and ocean habitats and the ecological processes that support those habitats.
- Improve coordination and management of state efforts to protect and conserve the ocean by establishing a cabinet level oversight body responsible for identifying more efficient methods of protecting the ocean at less cost to taxpayers.
- Use California's private and charitable resources more effectively in developing ocean protection and conservation strategies.
- Provide for public access to the ocean and ocean resources, including to MPAs, for recreational use, and aesthetic, educational, and scientific purposes, consistent with the sustainable long-term conservation of those resources.

California Marine Life Protection Act

The California MLPA was passed by the State Legislature in 1999 and is codified in the California Fish and Game Code Chapter 10.5, Sections 2850 to 2863. The Legislature enacted the MLPA in order to direct the state to reexamine and redesign California's system of MPAs through a comprehensive program and master plan. The Legislature recognized the benefits of setting aside some areas under special protection and of ensuring that these MPAs are developed in a systematic manner, with clear goals and objectives, and management plans and programs for monitoring and evaluating their effectiveness. The primary goals of the MLPA are to protect marine life and habitats, marine ecosystems and marine natural heritage, as well as improve recreational, educational and study opportunities provided by marine ecosystems. Rather than focusing on one use or value for MPAs, the MLPA recognizes a wide range of values, including the conservation of biological diversity (CDFG 2008).

Between 1999 and 2004, there were two efforts at implementing the MLPA. Both attempts suffered from a lack of adequate resources, and both failed to provide sufficient information to stakeholders, particularly regarding the potential socioeconomic impacts of potential MPAs. In the first attempt, the CDFG and the MLPA master plan team developed a set of initial proposals for a statewide network of MPAs without significant stakeholder input, even though the intent was to revise these initial proposals based on public comment as required by the MLPA. The second attempt was more inclusive of stakeholders, but suffered from a lack of staff and funding. After these unsuccessful attempts, state legislators and the CDFG realized that this complex and controversial process required significant resources and time to implement and evaluate successfully (CDFG 2008).

In August 2004, the California Resources Agency and CDFG partnered with the Resources Legacy Fund Foundation and others in a new initiative to achieve the MLPA goals. This public-private partnership, known as the MLPA Initiative, is designed to help the state of California implement the MLPA using the best readily available science as well as the advice and assistance of scientists, resource managers, experts, stakeholders, and other members of the public (CDFG 2008).

A Revised Draft California Marine Life Protection Act Master Plan for Marine Protected Areas was published in January 2008. The regulatory process for the South Coast region, which extends from Point Conception south to the California/Mexico border is being conducted. No MPAs currently exist in the vicinity of SNI but CDFG and USDOD are currently coordinating efforts through the development of INRMP's to propose various alternatives that would establish a State Marine Reserve at Begg Rock in order to support the MLPA.

Channel Islands Marine Protected Areas

In October 2002, the California Fish and Game Commission approved a comprehensive marine zoning network in state waters of the Channel Islands National Marine Sanctuary. The state of California implemented part of the state marine zones in 2003, under the California Fish and Game regulations. This represented a significant increase in the total amount of state waters included in MPAs through the establishment of a system of 13 new MPAs around the northern Channel Islands. Eleven of the state water MPAs are characterized as State Marine Reserves (SMRs) and two are State Marine Conservation Areas (SMCAs). SMRs prohibit all take of living, geological, or cultural resources. SMCAs prohibit specific commercial and/or recreational take of living, geological, or cultural resources on a case-by-case basis. Non-consumptive activities, such as diving, surfing, swimming, and boating are allowed within SMRs and SMCAs so long as take restrictions are followed. The establishment of the ten Channel Island SMRs increased the area of state waters in marine reserves from 0.2 to 2.5 percent (CDFG 2008).

In 2006, to provide protection to the sea floor and groundfish, NMFS designated the federal water portions offshore of the state MPAs as habitat areas of particular concern and prohibited bottom fishing under the Magnuson-Stevens Fishery Conservation and Management Act.

In 2007, NOAA completed the network of marine zones in the federal waters of Channel Islands National Marine Sanctuary. The federal water marine zones, which protect marine habitats and sensitive species, specifically went into effect on 29 July 2007 (NOAA Press Release 2007). NOAA's action complemented the existing network of marine zones established in the state waters of the sanctuary by the state of California in 2003. This federal action added nine new marine zones, eight of which are no-take marine reserves and one limited take marine conservation area. NOAA's action affects a total of 110.5 square nm (nm^2) as marine reserves and 1.7 nm^2 as marine conservation areas in the federal waters (three to six nautical miles offshore) of the sanctuary (NOAA Press Release 2007). The area of the network, including the existing state marine zones, was 214.1 nm^2. The two types of federal marine zones include marine reserves, where all extractive activities and injury to sanctuary resources are prohibited, and a federal marine conservation area that allows commercial and recreational lobster fishing and recreational fishing for pelagic species — all other resource extraction and injury is prohibited. NOAA's action prohibits any other take within the offshore marine zones under the National Marine Sanctuaries Act and represented a key step towards completing the marine zoning network supported by the California Fish and Game Commission, the PFMC and NMFS.

Some small gaps remained between the state and federal marine zones that were an artifact of squaring off the state marine zones in 2003 for enforcement and ease of recognition by boaters until the federal zones were established. The California Fish and Game Commission filled these small gaps in the fall of 2007 to complete the Channel Islands marine zoning network. The total network size in the northern Channel Islands is now 240.4 nm^2 that encompasses 22 percent of the sanctuary waters through 11 marine reserves and 2 marine conservation areas (NOAA Press Release 2007). Fishing in accordance with normal state and federal fishing regulations will be allowed in the remaining 78 percent of the sanctuary.

Marine Managed Areas Improvement Act

The state of California adopted another relevant law in 2000, the Marine Managed Areas Improvement Act (Stats. 2000, Chapter 385). This law sought to clarify and simplify the variety of existing designations for Marine Managed Areas that include MPAs (CDFG 2008).

B.4.3 Wildlife Population Laws

Marine Life Management Act

In 1998, the California State Legislature responded to shifts in understanding and public values, as well as declines in some fisheries and nearshore ecosystems, by adopting the MLMA (Stats. 1998, Chapter 1052). Before the MLMA, the State Legislature was responsible for managing most of California's marine resources harvested by commercial fisheries within state waters, while the CDFG and the Fish and Game Commission managed the recreational fisheries and those commercial fisheries with catch quotas that changed periodically. Management of commercial fisheries under this division of responsibility was complicated, piecemeal, and often untimely, with both the California State Assembly and California State Senate approving necessary regulatory changes only after much political deliberation The MLMA transferred permanent management authority to the Commission for the nearshore finfish fishery, the white seabass fishery, emerging fisheries, and other fisheries for which the Commission had some management authority prior to 01 January 1999. As importantly, the MLMA broadened the focus of fisheries management to include consideration of the ecosystem - the entire community of organisms (both fished and unfished) and the environment and habitats that those species depend on (CDFG 2008).

The MLMA includes a number of innovative features and goals:

- **Non-Consumptive Values.** The MLMA applies not only to fish and shellfish taken by commercial and recreational fishermen, but to all marine wildlife. Marine life need not be consumed to provide important benefits to people, including aesthetic and recreational enjoyment as well as scientific study and education.
- **Conserves Entire Systems.** It is not simply exploited populations of marine life that are to be conserved, but the species and habitats that make up the ecosystem of which they are a part. Rather than focusing on single fisheries management, the MLMA requires an ecosystem perspective including the whole environment. The habitat of marine wildlife is to be maintained, restored or enhanced, and any damage from fishing practices is to be minimized.
- **Sustainability.** Rather than assuming that exploitation should continue until damage has become clear, the MLMA shifts the burden of proof toward demonstrating that fisheries and other activities are sustainable. Depressed fisheries are to be rebuilt within a specified time. The bycatch of marine living resources in fisheries is to be limited to acceptable types and amounts.
- **Fishery Management Plans.** Rather than ad hoc and piecemeal decisions on individual fisheries, the aim is to base decisions on comprehensive reviews of fisheries and on clear objectives and measures for fostering sustainable fisheries. The vehicle for this objective is a fishery management plan.
- **Status of the Fisheries Report.** Annually, CDFG will prepare a report on the status of California's fisheries and the effectiveness of management programs.

The Legislature called initially for the adoption of only two Fishery Management Plans, for (1) the *white sea bass fishery*, and (2) the *nearshore finfish fishery* (rules for the latter apply to state waters from shore to 1 nm from land). However, the process has led to the development of management plans, or at least electronically posted fishery data, for other important marine taxa of San Nicolas Island (abalone, market squid, sea urchins). The Nearshore Fishery Management Plan was adopted by the Fish and Game Commission in 2002 and the Market Squid Fishery Management Plan was adopted by the Commission in 2004.

Marine Resources Protection Act of 1990

The Marine Resources Protection Act of 1990 was adopted as an initiative constitutional amendment at the 06 November 1990, general election. Section 8610.1-8610-6 of the California Fish and Game Code codifies and implements that initiative constitutional amendment. This state law prohibits the use of gill nets and trammel nets to take any species of rockfish south of Point Arguello. In addition, gill nets and trammel

nets cannot be used for any species in the Marine Resources Protection Zone, which includes waters within one nautical mile (or 70 fathoms, whichever is less) around San Miguel, Santa Rosa, Santa Cruz, Anacapa, San Nicolas, Santa Barbara, Santa Catalina, and San Clemente Islands (plus ocean waters within 3 nautical miles of the mainland between the Mexican border and Point Arguello).

B.4.4 Species of Concern Laws

California Endangered Species Act

The California Endangered Species Act (CESA) is very similar to the federal ESA and is administered by CDFG. The term endangered species is defined under CESA as a species of fish, wildlife or plant that is "in serious danger of becoming extinct throughout all, or a significant portion of its range". It is concerned with species and subspecies native to California. CESA prohibits the "taking" of listed species, but in addition to protecting listed species, it also applies the take prohibitions to species that are candidates for listing. Certain listed bird species are further classified by CDFG as "fully protected", wherein possession or taking of animals or parts thereof is prohibited at all times.

The California State Legislature has expressed its intent to protect, preserve and enhance endangered or rare species as issued in the Fish and Game Code (Div. 2, Chpt. 10 Native Plant Protection and Div. 3, Chpt. 1.5 Endangered Species). CESA violations can result in a fine of up to $5,000 and / or one year in prison. While this law does not apply to federal actions, it does apply to state agencies and private landowners. In the spirit of the law and as a service to state agencies and private landowners, federal agencies operate under these guidelines.

B.5 State Regulations

Fish and Game Code and Stream Alteration Controls

The CDFG's authority over the use of suction dredges (Fish and Game Code, § 5653), alterations of fish spawning areas (Fish and Game Code, § 1505), and alterations of stream beds in general (Fish and Game Code, §§ 1601 *et seq.*) are all useful tools for the protection of instream resources (but generally not for riparian vegetation outside of the stream or overflow areas). The §§ 1601-1603 agreements (§ 1601 covers public projects, while § 1603 addresses private work) do not have the status of state approvals under law, instead providing for a negotiation and agreement process.

Fish and Game Code and Title 14 California Code of Regulations

The Fish and Game Code consists of the laws passed by the state legislature that pertain to fish and wildlife resources. Under statutes in the Fish and Game Code, the California Fish and Game Commission has the responsibility for the adoption of regulations that provide details on how certain Fish and Game laws are to be implemented.

These regulations are published in Title 14 of the California Code of Regulations. A summary is provided below of Fish and Game Code Sections that address invasive species issues or may relate to control actions.

Fish and Game Code §§ 2080 - 2089. CDFG regulates the take of species listed under the CESA. In addition to the instructions in the Fish and Game Code, guidelines for this process are located in Title 14, Division 1, Subdivision 3, Chapter 6, Article 1 of the California Code of Regulations. These statutes and regulations should be consulted if AIS control measures have the potential to impact state-listed species.

Fish and Game Code §§ 2118, 2270-2272. The CDFG is responsible for enforcement of importation, transportation, and sheltering of restricted live wild animals; places importation restrictions on aquatic plants and animals; and prohibits nine species of *Caulerpa*.

Fish and Game Code §§ 6400-6403. It is unlawful to place live fish, fresh or saltwater animals or aquatic plants in any waters of this state without a permit from the CDFG.

B.6 Local Government

There is a limited direct involvement with the SNI natural resources program at the local, county, and municipal government levels.

Appendix C: List of Projects

Table C-1. SNI INRMP List of Natural Resource Management Projects - 2011 .

Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level
O&MN	69232B0094	Integrated Natural Resources Management Plan revisions and associated Environmental Assessment to incorporate current resources and management knowledge.	1
NBVC NR In House		Apply sustainability principles to the management of habitats, species, and ecological functions on SNI by identifying resource-specific best practices similar to SSI approaches.	1
NBVC NR In House		Protect the natural ecological integrity, structure, and functional values of the wetlands and floodplains on SNI.	1
O&MN	63126XXX85	Conduct regular monitoring of reptiles and amphibians in addition to island night lizard monitoring and develop accurate GIS data layers for known populations and conserve habitat associations to avoid sensitive areas and minimize potential impacts.	1
O&MN	63126EPRBird	Migratory and resident bird inventory and restoration management activities to conserve bird population and develop and maintain information on status and trend of population and habitats.	1
O&MN	63126XXX86	Monitor resident seabird populations and breeding colonies to track the sustainability of populations and their habitat.	1
NBVC NR In House		Implement bird conservation principles, measures, and practices through avoidance and minimization measures to protect resident and migratory bird populations.	1
O&MN	63126B0067	Inventory and monitor bat populations on SNI to adapt management strategies based on current population status.	1
O&MN	63126XXX88	Monitor island-wide pinniped breeding and haul out sites and periodic evaluation of current adaptive management practices.	1
Navy Tenant Funded	63126B003	Ensure that land use plans and activities in or near threatened or endangered species habitats are accomplished in accordance with the ESA in accordance with current Biological Opinions and with ESA Section 7 Consultation Handbook (USFWS/NMFS March 1998).	1
O&MN	63126B003	Per USFWS Biological Opinion (2001) provide the USFWS an annual report containing the number of island night lizards, California brown pelicans, and western snowy plover killed or injured by Navy activities, and a summary of Navy activities and their effects on listed species in accordance with the Reporting Requirements in the BO (USFWS 2001).	1
O&MN	63126XXX85	Support recovery plan efforts to establish stable island night lizard populations and eventual delisting by conducting site specific surveys prior to disturbance activities, implementing avoidance and minimization measures, and conducting studies to investigate the effectiveness of island night lizard management strategies with respect to impacts from alligator lizards and the relocation island night lizards.	1
Navy Tenant Funded	63126B003	Support recovery plan efforts to establish stable western snowy plover populations and eventual delisting by closing nesting areas to recreational activity during the March 1 - September 15 breeding season and by removing unnecessary structures in nesting areas.	1
Navy Tenant Funded	63126B003	Support recovery plan efforts to establish stable western snowy plover populations and eventual delisting by monitoring the effects of Navy activities on snowy plovers through conducting island-wide snowy plover censuses twice annually, once during the breeding season and once during the winter season, and through monitoring snowy plover nests during missile or target launches, general operations, and other activities that may disturb nesting behaviors.	1
O&MN	63126EPRBlackAb	Support recovery plan efforts to establish stable black abalone populations through continuing to conduct presence and absence surveys and through developing and implementing annual abalone monitoring protocols.	1
O&MN	63126EPRBlackAb	Continue to support appropriate closures at SNI and continue to review all military activities to ensure that they are in compliance with ESA and to avoid or minimize impacts to black abalone.	1
O&MN	63126EPRMarine	Support recovery plan efforts to establish stable white abalone populations by facilitating efforts to identify white abalone habitat and determine densities of individuals around SNI.	1
NBVC NR In House / Research Institutions		Support ongoing and new research on distribution and ecology of the Guadalupe fur seal. Encourage academic institutions to collect resource data. Record all sightings of Guadalupe fur seals and develop a database to track numbers of individuals, time of year, and location.	1
NBVC NR In House		Provide for the recovery, enhancement, and protection of species warranting Navy stewardship, as a proactive strategy to prevent federal listings and continue to resolve baseline biological data gaps.	1
O&MN	63126EPRBird	Provide for the recovery, enhancement, and protection of Xantus's murrelets, as a proactive strategy to prevent federal listings and continue to resolve baseline biological data gaps.	1
O&MN	63126EPRBird	Provide for the recovery, enhancement, and protection of ashy storm-petrels, as a proactive strategy to prevent federal listings and continue to resolve baseline biological data gaps.	1

Table C-1. SNI INRMP List of Natural Resource Management Projects - 2011 (Continued).

Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level
Navy Tenant Funded	63126XXX93	Maintain a viable population of the San Nicolas Island fox by reducing negative, human-caused impacts and remaining an active participant with other agencies regarding island fox issues.	1
Research Institutions		Determine the status of deer mouse populations and conserve and protect deer mouse habitat.	1
O&MN	63126EPRMarine	Support ongoing and new research on distribution and ecology of the southern sea otter at SNI. Encourage academic institutions to facilitate resource data collection and record all sightings of southern sea otters at SNI and develop a database to track numbers of individuals, time of year, and location.	1
O&MN	69232XXX90	Update and implement the invasive non-native plant species management and eradication program to insure use of existing BMPs to reduce the introduction of invasive species, establish early detection and rapid response protocol, map and prioritize most problematic terrestrial invasive non-native species populations, and maintain consistency with long-term protection of native plant communities.	1
O&MN	6923224086	Develop and implement a biosecurity plan to ensure invasive terrestrial fauna and flora are not brought to SNI by providing prevention, early detection, rapid response, and education guidelines.	1
O&MN	6923224086	Assess and monitor the progress and success of the removal of feral cats to support the shorebird enhancement project.	1
O&MN	63126EPRMarine Invasives	Develop and implement a plan to prevent the introduction of invasive non-native marine and coastal species into SNI waters which includes a standardized monitoring system focused on early detection for high priority aquatic invasive species, rapid response protocol, and promotes when an invasive is detected. Promote cooperative interagency efforts to collect and analyze comprehensive monitoring data.	1
NBVC NR In House		Minimize the introduction of pest species to SNI. Develop a rodent control /removal plan and implement if introduced species are detected. Determine presence or absence of non-native rodents.	1
NBVC NR In House / Research Institutions		Set up a central clearinghouse for data, reports, and publications pertaining to the NBVC's EMS that addresses natural resources and that is accessible to staff.	1
NBVC NR In House		Maintain habitats using principles of ecosystem management and sustainability and continue to use NEPA documentation. Define benefit or impact to the military mission.	1
O&MN	63126EPRClimateChange	Control and reduce greenhouse gas emissions by improving governance, implementing the SNI Net Zero Energy Installation Plan, providing energy conservation education, and addressing impacts in NEPA documents.	1
NBVC NR In House / Project Proponent		Promote training in sustainable design criteria for Navy staff and apply sustainability principles to the management of natural resources and the built environment by using metrics (indicators) of sustainability and by adopting LEED, LID, and Sustainable Sites Initiative approaches while continuing to use RSIP, master planning, site approval, and NEPA processes.	1
NBVC NR In House		Establish protocols for emergency and regular repair of infrastructure so that human life, health and safety are given precedence, but sensitive resources are also protected. Consider fish and wildlife conservation in all site feasibility studies and during project planning, design and construction.	1
NBVC NR In House / Project Proponent		Ensure siting criteria are addressed through the Project Review Board (NBVCINST 11010.1). Any proposed towers will also comply with USFWS guidelines for reducing fatal bird strikes to the greatest extent practicable.	1
NBVC NR In House		Participate in conservation, ecosystem, invasive species, and feral animal control planning in collaboration with other government agencies.	1
NBVC NR In House		Seek out and encourage partners to support independent scientific research and to develop cooperative research agreements focused on examining marine recruitment processes of important indicator species or species of concern.	1
NBVC NR In House		Remain an active participant with other agencies regarding San Nicolas Island fox and San Nicolas Island deer mouse issues.	1
NBVC NR In House		Support the integration of SNI into the Invasive Species Task Force on Santa Cruz Island and other Channel Islands as opportunities arise.	1
NBVC NR In House		Promote cooperative interagency efforts to collect and analyze comprehensive aquatic invasive species monitoring data, including shared funding and staff.	1
NBVC NR In House		Consult with USFWS and CDFG at least annually to fulfill SAIA provisions and related inter-agency cooperative agreements.	1
NBVC NR In House		Consider the use of Cooperative Agreements to get work done, especially research. A long-term advisory relationship and cooperative research relationship could continue with local universities.	1
NBVC NR In House		Establish and implement clear, coherent policies regarding public access to SNI including the near shore environment. Take active measures to discourage trespass and minimize the impacts of unauthorized access.	1
NBVC NR In House		Identify natural resource themes for public outreach. Participate in Earth Day and annual science festivals that occur in adjacent communities on the mainland.	1
NBVC NR In House		Ensure consistency with Coastal Zone Plans.	1
NBVC NR In House		Continue to participate in the Project Review Board and the Site Approval and Project Review Process and coordinate with the Cultural Resources program.	1
NBVC NR In House		Continue to use NEPA planning processes and documentation to guide specific projects and document choices and enforce mitigation measures proposed in those NEPA documents.	1

Table C-1. SNI INRMP List of Natural Resource Management Projects - 2011 (Continued).

Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level
NBVC NR In House		Support research to improve the adequacy of cumulative effects analysis, standardize the format in documents, and develop and implement compensation for cumulative effects.	1
NBVC NR In House		Conserve existing habitat values by promoting experimentation and application of alternative shoreline and underwater habitat structures. Encourage refitting of developed shorelines and existing structures to enhance habitat values.	1
NBVC NR In House		Promote experimentation and application of alternative LID and habitat-friendly landscaped areas adjacent to the shore.	1
NBVC NR In House		Implement this INRMP by applying it as an initial screen for review of projects proposed on the installation from both Navy and outside interests to improve the success of mitigation and enhancement projects based on regulatory, functional, and ecosystem criteria.	1
NBVC NR In House		Enforce Seasonal Avoidance Measures and Standard Mitigation Measures.	1
O&MN	63126EPREducation	Improve SNI community and environmental outreach through facilitating development of environmental education curriculum for researchers, personnel, and contractors. This will be accomplished by developing and distributing educational material, expanding education partnerships, by securing long-term funding to continue environmental education programs (e.g. brochures and videos), and evaluate the effectiveness of existing environmental education programs.	1
NBVC NR In House		Provide information and education for the enforcement of natural resource laws and regulations by professionally trained personnel such as federal and state Conservation Officers.	1
NBVC NR In House		Maintain staff knowledge through training and participation in natural resource research and conservation programs and share information with natural resource experts.	1
NBVC NR In House		Provide a notice of the intent to revise the INRMP to the USFWS and CDFG if a revision is found necessary.	1
NBVC NR In House		Comply with recent CNI draft guidance on INRMPs and continue to utilize the INRMP Metrics Builder to assess implementation.	1
NBVC NR In House		Provide funding and support for research and other studies to further SNI natural resources management.	1
NBVC NR In House		Provide documentation to secure appropriate levels of NBVC NR In House funding to support natural resource management programs.	1
NBVC NR In House		Develop prioritized lists of proposed management efforts to guide development of funding proposals.	1
NBVC NR In House		Develop plans and documentation to secure external funding and continue to request external funding from other state and federal agencies.	1
NBVC NR In House		Support scientific, academic, and volunteer efforts to initiate or supplement natural resources management programs.	1
NBVC NR In House		Identify and ensure departments prioritize and allocate funding to support compliance requirements.	1
NBVC NR In House		Seek awards for natural resource work conducted at SNI.	1
NBVC NR In House		Continue to ensure effective communication, adaptive oversight, and policy leadership through the USDON Natural Resources Strategic Plan.	1

Table C-2. SNI INRMP List of Natural Resource Management Projects - 2012 .

Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level
O&MN	69232B0094	Integrated Natural Resources Management Plan revisions and associated Environmental Assessment to incorporate current resources and management knowledge.	1
NBVC NR In House		Apply sustainability principles to the management of habitats, species, and ecological functions on SNI by identifying resource-specific best practices similar to Sustainable Sites Initiatives (SSI) approaches.	1
NBVC NR In House		Protect the natural ecological integrity, structure, and functional values of the wetlands and floodplains on SNI.	1
O&MN	63126EPRMarine	Collect baseline information and establish monitoring protocols for sandy beach communities to support management to maintain habitat integrity.	1
O&MN	63126EPRMarine	Continue rocky intertidal surveys and encourage additional monitoring at SNI consistent with monitoring performed at the other Channel Islands and throughout California, to establish regional trends and understand site specific change.	1
O&MN	63126EPRMarine	Develop and implement unvegetated and vegetated soft bottom monitoring protocols at SNI to determine resource status and extent of submerged aquatic vegetation (eelgrass).	1
O&MN	63126EPRMarine	Support establishment of kelp forest ecosystem monitoring locations around SNI while encouraging state and federal agencies and academic researchers to investigate important community related questions involving recruitment, disturbance, and species diversity that help to assess regional trends.	1
NBVC NR In House		Develop management strategies through partnerships with the BLM to support the management of the Begg Rock State Marine Reserve and of the offshore rocks near SNI and Begg Rock that are designated as part of the CCNM.	1
O&MN	63126XXX85	Conduct regular monitoring of reptiles and amphibians in addition to island night lizard monitoring and develop accurate GIS data layers for known populations and conserve habitat associations to avoid sensitive areas and minimize potential impacts.	1
O&MN	63126EPRBird	Migratory and resident bird inventory and restoration management activities to conserve bird population and develop and maintain information on status and trend of population and habitats.	1
O&MN	63126XXX86	Monitor resident seabird populations and breeding colonies to track the sustainability of populations and their habitat.	1
NBVC NR In House		Implement bird conservation principles, measures, and practices through avoidance and minimization measures to protect resident and migratory bird populations.	1
O&MN	63126B0067	Inventory and monitor bat populations on SNI to adapt management strategies based on current population status.	1
O&MN	63126EPRMarine	Collect community level marine macroalgae baseline information surveys to support focused management efforts and identify indicator species. Survey subtidal and intertidal areas near high use locations (pier and barge landing areas) for the introduction of non-native invasive species.	1
O&MN	63126XXX88	Monitor island-wide pinniped breeding and haul out sites and periodic evaluation of current adaptive management practices.	1
Navy Tenant Funded	63126B003	Ensure that land use plans and activities in or near threatened or endangered species habitats are accomplished in accordance with the ESA in accordance with current Biological Opinions and with ESA Section 7 Consultation Handbook (USFWS/NMFS March 1998).	1
O&MN	63126B003	Per USFWS Biological Opinion (2001) provide the USFWS an annual report containing the number of island night lizards, California brown pelicans, and western snowy plover killed or injured by Navy activities, and a summary of Navy activities and their effects on listed species in accordance with the Reporting Requirements in the BO (USFWS 2001).	1
O&MN	63126XXX85	Support recovery plan efforts to establish stable island night lizard populations and eventual delisting by conducting site specific surveys prior to disturbance activities, implementing avoidance and minimization measures, and conducting studies to investigate the effectiveness of island night lizard management strategies with respect to impacts from alligator lizards and the relocation island night lizards.	1
Navy Tenant Funded	63126B003	Support recovery plan efforts to establish stable western snowy plover populations and eventual delisting by closing nesting areas to recreational activity during the March 1 - September 15 breeding season and by removing unnecessary structures in nesting areas.	1
Navy Tenant Funded	63126B003	Support recovery plan efforts to establish stable western snowy plover populations and eventual delisting by monitoring the effects of Navy activities on snowy plovers through conducting island-wide snowy plover censuses twice annually, once during the breeding season and once during the winter season, and through monitoring snowy plover nests during missile or target launches, general operations, and other activities that may disturb nesting behaviors.	1
O&MN	63126EPRBlackAb	Support recovery plan efforts to establish stable black abalone populations through continuing to conduct presence and absence surveys and through developing and implementing annual abalone monitoring protocols.	1
O&MN	63126EPRBlackAb	Continue to support appropriate closures at SNI and continue to review all military activities to ensure that they are in compliance with ESA and to avoid or minimize impacts to black abalone.	1
O&MN	63126EPRMarine	Support recovery plan efforts to establish stable white abalone populations by facilitating efforts to identify white abalone habitat and determine densities of individuals around SNI.	1
NBVC NR In House/ Research Institutions		Support ongoing and new research on distribution and ecology of the Guadalupe fur seal. Encourage academic institutions to collect resource data. Record all sightings of Guadalupe fur seals and develop a database to track numbers of individuals, time of year, and location.	1

Table C-2. SNI INRMP List of Natural Resource Management Projects - 2012 (Continued).

Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level
NBVC NR In House		Provide for the recovery, enhancement, and protection of species warranting Navy stewardship, as a proactive strategy to prevent federal listings and continue to resolve baseline biological data gaps.	1
O&MN	63126EPRBird	Provide for the recovery, enhancement, and protection of Xantus's murrelets, as a proactive strategy to prevent federal listings and continue to resolve baseline biological data gaps.	1
O&MN	63126EPRBird	Provide for the recovery, enhancement, and protection of ashy storm-petrels, as a proactive strategy to prevent federal listings and continue to resolve baseline biological data gaps.	1
Navy Tenant Funded	63126XXX93	Maintain a viable population of the San Nicolas Island fox by reducing negative, human-caused impacts and remaining an active participant with other agencies regarding island fox issues.	1
Research Institutions		Determine the status of deer mouse populations and conserve and protect deer mouse habitat.	1
O&MN	63126EPRMarine	Support ongoing and new research on distribution and ecology of the southern sea otter at SNI. Encourage academic institutions to facilitate resource data collection and record all sightings of southern sea otters at SNI and develop a database to track numbers of individuals, time of year, and location.	1
O&MN	69232XXX90	Update and implement the invasive non-native plant species management and eradication program to insure use of existing BMPs to reduce the introduction of invasive species, establish early detection and rapid response protocol, map and prioritize most problematic terrestrial invasive non-native species populations, and maintain consistency with long-term protection of native plant communities.	1
O&MN	6923224086	Develop and implement a biosecurity plan to ensure invasive terrestrial fauna and flora are not brought to SNI by providing prevention, early detection, rapid response, and education guidelines.	1
O&MN	6923224086	Assess and monitor the progress and success of the removal of feral cats to support the shorebird enhancement project.	1
O&MN	63126EPRMarine Invasives	Develop and implement a plan to prevent the introduction of invasive non-native marine and coastal species into SNI waters which includes a standardized monitoring system focused on early detection for high priority aquatic invasive species, rapid response protocol, and promotes when an invasive is detected. Promote cooperative interagency efforts to collect and analyze comprehensive monitoring data.	1
NBVC NR In House		Minimize the introduction of pest species to SNI. Develop a rodent control /removal plan and implement if introduced species are detected. Determine presence or absence of non-native rodents.	1
NBVC NR In House / Research Institutions		Set up a central clearinghouse for data, reports, and publications pertaining to the NBVC's EMS that addresses natural resources and that is accessible to staff.	1
NBVC NR In House		Maintain habitats using principles of ecosystem management and sustainability and continue to use NEPA documentation. Define benefit or impact to the military mission.	1
O&MN	63126EPRClimateChange	Control and reduce greenhouse gas emissions by improving governance, implementing the SNI Net Zero Energy Installation Plan, providing energy conservation education, and addressing impacts in NEPA documents.	1
NBVC NR In House / Project Proponent		Promote training in sustainable design criteria for Navy staff and apply sustainability principles to the management of natural resources and the built environment by using metrics (indicators) of sustainability and by adopting LEED, LID, and Sustainable Sites Initiative approaches while continuing to use RSIP, master planning, site approval, and NEPA processes.	1
NBVC NR In House		Establish protocols for emergency and regular repair of infrastructure so that human life, health and safety are given precedence, but sensitive resources are also protected. Consider fish and wildlife conservation in all site feasibility studies and during project planning, design and construction.	1
NBVC NR In House / Project Proponent		Ensure siting criteria are addressed through the Project Review Board (NBVCINST 11010.1). Any proposed towers will also comply with USFWS guidelines for reducing fatal bird strikes to the greatest extent practicable.	1
NBVC NR In House		Participate in conservation, ecosystem, invasive species, and feral animal control planning in collaboration with other government agencies.	1
NBVC NR In House		Seek out and encourage partners to support independent scientific research and to develop cooperative research agreements focused on examining marine recruitment processes of important indicator species or species of concern.	1
NBVC NR In House		Remain an active participant with other agencies regarding San Nicolas Island fox and San Nicolas Island deer mouse issues.	1
NBVC NR In House		Support the integration of SNI into the Invasive Species Task Force on Santa Cruz Island and other Channel Islands as opportunities arise.	1
NBVC NR In House		Promote cooperative interagency efforts to collect and analyze comprehensive aquatic invasive species monitoring data, including shared funding and staff.	1
NBVC NR In House		Consult with USFWS and CDFG at least annually to fulfill SAIA provisions and related inter-agency cooperative agreements.	1
NBVC NR In House		Consider the use of Cooperative Agreements to get work done, especially research. A long-term advisory relationship and cooperative research relationship could continue with local universities.	1
NBVC NR In House		Establish and implement clear, coherent policies regarding public access to SNI including the near shore environment. Take active measures to discourage trespass and minimize the impacts of unauthorized access.	1

Table C-2. SNI INRMP List of Natural Resource Management Projects - 2012 (Continued).

Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level
NBVC NR In House		Identify natural resource themes for public outreach. Participate in Earth Day and annual science festivals that occur in adjacent communities on the mainland.	1
NBVC NR In House		Ensure consistency with Coastal Zone Plans.	1
NBVC NR In House		Continue to participate in the Project Review Board and the Site Approval and Project Review Process and coordinate with the Cultural Resources program.	1
NBVC NR In House		Continue to use NEPA planning processes and documentation to guide specific projects and document choices and enforce mitigation measures proposed in those NEPA documents.	1
NBVC NR In House		Support research to improve the adequacy of cumulative effects analysis, standardize the format in documents, and develop and implement compensation for cumulative effects.	1
NBVC NR In House		Conserve existing habitat values by promoting experimentation and application of alternative shoreline and underwater habitat structures. Encourage refitting of developed shorelines and existing structures to enhance habitat values.	1
NBVC NR In House		Promote experimentation and application of alternative LID and habitat-friendly landscaped areas adjacent to the shore.	1
NBVC NR In House		Implement this INRMP by applying it as an initial screen for review of projects proposed on the installation from both Navy and outside interests to improve the success of mitigation and enhancement projects based on regulatory, functional, and ecosystem criteria.	1
NBVC NR In House		Enforce Seasonal Avoidance Measures and Standard Mitigation Measures.	1
O&MN	63126EPREducation	Improve SNI community and environmental outreach through facilitating development of environmental education curriculum for researchers, personnel, and contractors. This will be accomplished by developing and distributing educational material, expanding education partnerships, by securing long-term funding to continue environmental education programs (e.g. brochures and videos), and evaluate the effectiveness of existing environmental education programs.	1
NBVC NR In House		Provide information and education for the enforcement of natural resource laws and regulations by professionally trained personnel such as federal and state Conservation Officers.	1
NBVC NR In House		Maintain staff knowledge through training and participation in natural resource research and conservation programs and share information with natural resource experts.	1
NBVC NR In House		Provide a notice of the intent to revise the INRMP to the USFWS and CDFG if a revision is found necessary.	1
NBVC NR In House		Comply with recent CNI draft guidance on INRMPs and continue to utilize the INRMP Metrics Builder to assess implementation.	1
NBVC NR In House		Provide funding and support for research and other studies to further SNI natural resources management.	1
NBVC NR In House		Provide documentation to secure appropriate levels of NBVC NR In House funding to support natural resource management programs.	1
NBVC NR In House		Develop prioritized lists of proposed management efforts to guide development of funding proposals.	1
NBVC NR In House		Develop plans and documentation to secure external funding and continue to request external funding from other state and federal agencies.	1
NBVC NR In House		Support scientific, academic, and volunteer efforts to initiate or supplement natural resources management programs.	1
NBVC NR In House		Identify and ensure departments prioritize and allocate funding to support compliance requirements.	1
NBVC NR In House		Seek awards for natural resource work conducted at SNI.	1
NBVC NR In House		Continue to ensure effective communication, adaptive oversight, and policy leadership through the USDON Natural Resources Strategic Plan.	1

Table C-3. SNI INRMP List of Natural Resource Management Projects - 2013 .

Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level
O&MN	69232B0094	Integrated Natural Resources Management Plan revisions and associated Environmental Assessment to incorporate current resources and management knowledge.	1
NBVC NR In House		Apply sustainability principles to the management of habitats, species, and ecological functions on SNI by identifying resource-specific best practices similar to Sustainable Sites Initiatives (SSI) approaches.	1
NBVC NR In House		Protect the natural ecological integrity, structure, and functional values of the wetlands and floodplains on SNI.	1
O&MN	63126XXX97	Collect baseline information on the invertebrate community of SNI, with particular emphasis on endemics and pollinators.	1
O&MN	63126XXX85	Conduct regular monitoring of reptiles and amphibians in addition to island night lizard monitoring and develop accurate GIS data layers for known populations and conserve habitat associations to avoid sensitive areas and minimize potential impacts.	1
O&MN	63126EPRBird	Migratory and resident bird inventory and restoration management activities to conserve bird population and develop and maintain information on status and trend of population and habitats.	1
O&MN	63126XXX86	Monitor resident seabird populations and breeding colonies to track the sustainability of populations and their habitat.	1
NBVC NR In House		Implement bird conservation principles, measures, and practices through avoidance and minimization measures to protect resident and migratory bird populations.	1
Research Institutions		Support small mammal monitoring programs at SNI to adapt management strategies based on current population status.	1
O&MN	63126B0067	Inventory and monitor bat populations on SNI to adapt management strategies based on current population status.	1
O&MN	63126EPRMarine	Develop a fish monitoring program and management plan to conserve fish population abundance and habitat diversity.	1
O&MN	63126XXX88	Monitor island-wide pinniped breeding and haul out sites and periodic evaluation of current adaptive management practices.	1
Navy Tenant Funded	63126B003	Ensure that land use plans and activities in or near threatened or endangered species habitats are accomplished in accordance with the ESA in accordance with current Biological Opinions and with ESA Section 7 Consultation Handbook (USFWS/NMFS March 1998).	1
O&MN	63126B003	Per USFWS Biological Opinion (2001) provide the USFWS an annual report containing the number of island night lizards, California brown pelicans, and western snowy plover killed or injured by Navy activities, and a summary of Navy activities and their effects on listed species in accordance with the Reporting Requirements in the BO (USFWS 2001).	1
O&MN	63126XXX85	Support recovery plan efforts to establish stable island night lizard populations and eventual delisting by conducting site specific surveys prior to disturbance activities, implementing avoidance and minimization measures, and conducting studies to investigate the effectiveness of island night lizard management strategies with respect to impacts from alligator lizards and the relocation island night lizards.	1
Navy Tenant Funded	63126B003	Support recovery plan efforts to establish stable western snowy plover populations and eventual delisting by closing nesting areas to recreational activity during the March 1 - September 15 breeding season and by removing unnecessary structures in nesting areas.	1
Navy Tenant Funded	63126B003	Support recovery plan efforts to establish stable western snowy plover populations and eventual delisting by monitoring the effects of Navy activities on snowy plovers through conducting island-wide snowy plover censuses twice annually, once during the breeding season and once during the winter season, and through monitoring snowy plover nests during missile or target launches, general operations, and other activities that may disturb nesting behaviors.	1
O&MN	63126EPRBlackAb	Support recovery plan efforts to establish stable black abalone populations through continuing to conduct presence and absence surveys and through developing and implementing annual abalone monitoring protocols.	1
O&MN	63126EPRBlackAb	Continue to support appropriate closures at SNI and continue to review all military activities to ensure that they are in compliance with ESA and to avoid or minimize impacts to black abalone.	1
O&MN	63126EPRMarine	Support recovery plan efforts to establish stable white abalone populations by facilitating efforts to identify white abalone habitat and determine densities of individuals around SNI.	1
NBVC NR In House / Research Institutions		Support ongoing and new research on distribution and ecology of the Guadalupe fur seal. Encourage academic institutions to collect resource data. Record all sightings of Guadalupe fur seals and develop a database to track numbers of individuals, time of year, and location.	1
NBVC NR In House		Provide for the recovery, enhancement, and protection of species warranting Navy stewardship, as a proactive strategy to prevent federal listings and continue to resolve baseline biological data gaps.	1
O&MN	63126XXX97	Collect baseline information on the special status native invertebrate species of SNI.	1
O&MN	63126EPRBird	Provide for the recovery, enhancement, and protection of Xantus's murrelets, as a proactive strategy to prevent federal listings and continue to resolve baseline biological data gaps.	1
O&MN	63126EPRBird	Provide for the recovery, enhancement, and protection of ashy storm-petrels, as a proactive strategy to prevent federal listings and continue to resolve baseline biological data gaps.	1

Table C-3. SNI INRMP List of Natural Resource Management Projects - 2013 (Continued).

Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level
Navy Tenant Funded	63126XXX93	Maintain a viable population of the San Nicolas Island fox by reducing negative, human-caused impacts and remaining an active participant with other agencies regarding island fox issues.	1
Research Institutions		Determine the status of deer mouse populations and conserve and protect deer mouse habitat.	1
O&MN	63126EPRMarine	Support ongoing and new research on distribution and ecology of the southern sea otter at SNI. Encourage academic institutions to facilitate resource data collection and record all sightings of southern sea otters at SNI and develop a database to track numbers of individuals, time of year, and location.	1
O&MN	69232XXX90	Update and implement the invasive non-native plant species management and eradication program to insure use of existing BMPs to reduce the introduction of invasive species, establish early detection and rapid response protocol, map and prioritize most problematic terrestrial invasive non-native species populations, and maintain consistency with long-term protection of native plant communities.	1
O&MN	6923224086	Develop and implement a biosecurity plan to ensure invasive terrestrial fauna and flora are not brought to SNI by providing prevention, early detection, rapid response, and education guidelines.	1
O&MN	6923224086	Assess and monitor the progress and success of the removal of feral cats to support the shorebird enhancement project.	1
O&MN	63126EPRMarine Invasives	Develop and implement a plan to prevent the introduction of invasive non-native marine and coastal species into SNI waters which includes a standardized monitoring system focused on early detection for high priority aquatic invasive species, rapid response protocol, and promotes when an invasive is detected. Promote cooperative interagency efforts to collect and analyze comprehensive monitoring data.	1
NBVC NR In House		Minimize the introduction of pest species to SNI. Develop a rodent control /removal plan and implement if introduced species are detected. Determine presence or absence of non-native rodents.	1
NBVC NR In House / Research Institutions		Set up a central clearinghouse for data, reports, and publications pertaining to the NBVC's EMS that addresses natural resources and that is accessible to staff.	1
NBVC NR In House		Maintain habitats using principles of ecosystem management and sustainability and continue to use NEPA documentation. Define benefit or impact to the military mission.	1
O&MN	63126EPRClimateChange	Control and reduce greenhouse gas emissions by improving governance, implementing the SNI Net Zero Energy Installation Plan, providing energy conservation education, and addressing impacts in NEPA documents.	1
NBVC NR In House / Project Proponent		Promote training in sustainable design criteria for Navy staff and apply sustainability principles to the management of natural resources and the built environment by using metrics (indicators) of sustainability and by adopting LEED, LID, and Sustainable Sites Initiative approaches while continuing to use RSIP, master planning, site approval, and NEPA processes.	1
NBVC NR In House		Establish protocols for emergency and regular repair of infrastructure so that human life, health and safety are given precedence, but sensitive resources are also protected. Consider fish and wildlife conservation in all site feasibility studies and during project planning, design and construction.	1
NBVC NR In House / Project Proponent		Ensure siting criteria are addressed through the Project Review Board (NBVCINST 11010.1). Any proposed towers will also comply with USFWS guidelines for reducing fatal bird strikes to the greatest extent practicable.	1
NBVC NR In House		Participate in conservation, ecosystem, invasive species, and feral animal control planning in collaboration with other government agencies.	1
NBVC NR In House		Seek out and encourage partners to support independent scientific research and to develop cooperative research agreements focused on examining marine recruitment processes of important indicator species or species of concern.	1
NBVC NR In House		Remain an active participant with other agencies regarding San Nicolas Island fox and San Nicolas Island deer mouse issues.	1
NBVC NR In House		Support the integration of SNI into the Invasive Species Task Force on Santa Cruz Island and other Channel Islands as opportunities arise.	1
NBVC NR In House		Promote cooperative interagency efforts to collect and analyze comprehensive aquatic invasive species monitoring data, including shared funding and staff.	1
NBVC NR In House		Consult with USFWS and CDFG at least annually to fulfill SAIA provisions and related inter-agency cooperative agreements.	1
NBVC NR In House		Consider the use of Cooperative Agreements to get work done, especially research. A long-term advisory relationship and cooperative research relationship could continue with local universities.	1
NBVC NR In House		Establish and implement clear, coherent policies regarding public access to SNI including the near shore environment. Take active measures to discourage trespass and minimize the impacts of unauthorized access.	1
NBVC NR In House		Identify natural resource themes for public outreach. Participate in Earth Day and annual science festivals that occur in adjacent communities on the mainland.	1
NBVC NR In House		Ensure consistency with Coastal Zone Plans.	1
NBVC NR In House		Continue to participate in the Project Review Board and the Site Approval and Project Review Process and coordinate with the Cultural Resources program.	1
NBVC NR In House		Continue to use NEPA planning processes and documentation to guide specific projects and document choices and enforce mitigation measures proposed in those NEPA documents.	1

Table C-3. SNI INRMP List of Natural Resource Management Projects - 2013 (Continued).

Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level
NBVC NR In House		Collect and distribute data on sediment contamination to minimize risks to recreational and commercial water contact users, recreational and commercial fisheries, and to wildlife species.	1
NBVC NR In House		Support research to improve the adequacy of cumulative effects analysis, standardize the format in documents, and develop and implement compensation for cumulative effects.	1
NBVC NR In House		Conserve existing habitat values by promoting experimentation and application of alternative shoreline and underwater habitat structures. Encourage refitting of developed shorelines and existing structures to enhance habitat values.	1
NBVC NR In House		Promote experimentation and application of alternative LID and habitat-friendly landscaped areas adjacent to the shore.	1
NBVC NR In House		Implement this INRMP by applying it as an initial screen for review of projects proposed on the installation from both Navy and outside interests to improve the success of mitigation and enhancement projects based on regulatory, functional, and ecosystem criteria.	1
NBVC NR In House		Enforce Seasonal Avoidance Measures and Standard Mitigation Measures.	1
O&MN	63126EPREducation	Improve SNI community and environmental outreach through facilitating development of environmental education curriculum for researchers, personnel, and contractors. This will be accomplished by developing and distributing educational material, expanding education partnerships, by securing long-term funding to continue environmental education programs (e.g. brochures and videos), and evaluate the effectiveness of existing environmental education programs.	1
NBVC NR In House		Provide information and education for the enforcement of natural resource laws and regulations by professionally trained personnel such as federal and state Conservation Officers.	1
NBVC NR In House		Maintain staff knowledge through training and participation in natural resource research and conservation programs and share information with natural resource experts.	1
NBVC NR In House		Provide a notice of the intent to revise the INRMP to the USFWS and CDFG if a revision is found necessary.	1
NBVC NR In House		Comply with recent CNI draft guidance on INRMPs and continue to utilize the INRMP Metrics Builder to assess implementation.	1
NBVC NR In House		Provide funding and support for research and other studies to further SNI natural resources management.	1
NBVC NR In House		Provide documentation to secure appropriate levels of NBVC NR In House funding to support natural resource management programs.	1
NBVC NR In House		Develop prioritized lists of proposed management efforts to guide development of funding proposals.	1
NBVC NR In House		Develop plans and documentation to secure external funding and continue to request external funding from other state and federal agencies.	1
NBVC NR In House		Support scientific, academic, and volunteer efforts to initiate or supplement natural resources management programs.	1
NBVC NR In House		Identify and ensure departments prioritize and allocate funding to support compliance requirements.	1
NBVC NR In House		Seek awards for natural resource work conducted at SNI.	1
NBVC NR In House		Continue to ensure effective communication, adaptive oversight, and policy leadership through the USDON Natural Resources Strategic Plan.	1

Table C-4. SNI INRMP List of Natural Resource Management Projects - 2014 .

Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level
O&MN	69232B0094	Integrated Natural Resources Management Plan revisions and associated Environmental Assessment to incorporate current resources and management knowledge.	1
NBVC NR In House		Apply sustainability principles to the management of habitats, species, and ecological functions on SNI by identifying resource-specific best practices similar to Sustainable Sites Initiatives (SSI) approaches.	1
NBVC NR In House		Protect the natural ecological integrity, structure, and functional values of the wetlands and floodplains on SNI.	1
O&MN	63126EPRMarine	Collect baseline inforNBVCINST 11010.1mation and establish monitoring protocols for sandy beach communities to support management to maintain habitat integrity.	1
O&MN	63126EPRMarine	Continue rocky intertidal surveys and encourage additional monitoring at SNI consistent with monitoring performed at the other Channel Islands and throughout California, to establish regional trends and understand site specific change.	1
O&MN	63126EPRMarine	Develop and implement unvegetated and vegetated soft bottom monitoring protocols at SNI to determine resource status and extent of submerged aquatic vegetation (eelgrass).	1
O&MN	63126EPRMarine	Support establishment of kelp forest ecosystem monitoring locations around SNI while encouraging state and federal agencies and academic researchers to investigate important community related questions involving recruitment, disturbance, and species diversity that help to assess regional trends.	1
NBVC NR In House		Develop management strategies through partnerships with the BLM to support the management of the Begg Rock State Marine Reserve and of the offshore rocks near SNI and Begg Rock that are designated as part of the CCNM.	1
O&MN	63126XXX85	Conduct regular monitoring of reptiles and amphibians in addition to island night lizard monitoring and develop accurate GIS data layers for known populations and conserve habitat associations to avoid sensitive areas and minimize potential impacts.	1
O&MN	63126EPRBird	Migratory and resident bird inventory and restoration management activities to conserve bird population and develop and maintain information on status and trend of population and habitats.	1
O&MN	63126XXX86	Monitor resident seabird populations and breeding colonies to track the sustainability of populations and their habitat.	1
NBVC NR In House		Implement bird conservation principles, measures, and practices through avoidance and minimization measures to protect resident and migratory bird populations.	1
O&MN	63126B0067	Inventory and monitor bat populations on SNI to adapt management strategies based on current population status.	1
O&MN	63126EPRMarine	Collect community level marine macroalgae baseline information surveys to support focused management efforts and identify indicator species. Survey subtidal and intertidal areas near high use locations (pier and barge landing areas) for the introduction of non-native invasive species.	1
O&MN	63126XXX88	Monitor island-wide pinniped breeding and haul out sites and periodic evaluation of current adaptive management practices.	1
Navy Tenant Funded	63126B003	Ensure that land use plans and activities in or near threatened or endangered species habitats are accomplished in accordance with the ESA in accordance with current Biological Opinions and with ESA Section 7 Consultation Handbook (USFWS/NMFS March 1998).	1
O&MN	63126B003	Per USFWS Biological Opinion (2001) provide the USFWS an annual report containing the number of island night lizards, California brown pelicans, and western snowy plover killed or injured by Navy activities, and a summary of Navy activities and their effects on listed species in accordance with the Reporting Requirements in the BO (USFWS 2001).	1
O&MN	63126XXX85	Support recovery plan efforts to establish stable island night lizard populations and eventual delisting by conducting site specific surveys prior to disturbance activities, implementing avoidance and minimization measures, and conducting studies to investigate the effectiveness of island night lizard management strategies with respect to impacts from alligator lizards and the relocation island night lizards.	1
Navy Tenant Funded	63126B003	Support recovery plan efforts to establish stable western snowy plover populations and eventual delisting by closing nesting areas to recreational activity during the March 1 - September 15 breeding season and by removing unnecessary structures in nesting areas.	1
Navy Tenant Funded	63126B003	Support recovery plan efforts to establish stable western snowy plover populations and eventual delisting by monitoring the effects of Navy activities on snowy plovers through conducting island-wide snowy plover censuses twice annually, once during the breeding season and once during the winter season, and through monitoring snowy plover nests during missile or target launches, general operations, and other activities that may disturb nesting behaviors.	1
O&MN	63126EPRBlackAb	Support recovery plan efforts to establish stable black abalone populations through continuing to conduct presence and absence surveys and through developing and implementing annual abalone monitoring protocols.	1
O&MN	63126EPRBlackAb	Continue to support appropriate closures at SNI and continue to review all military activities to ensure that they are in compliance with ESA and to avoid or minimize impacts to black abalone.	1
O&MN	63126EPRMarine	Support recovery plan efforts to establish stable white abalone populations by facilitating efforts to identify white abalone habitat and determine densities of individuals around SNI.	1
NBVC NR In House / Research Institutions		Support ongoing and new research on distribution and ecology of the Guadalupe fur seal. Encourage academic institutions to collect resource data. Record all sightings of Guadalupe fur seals and develop a database to track numbers of individuals, time of year, and location.	1

Table C-4. SNI INRMP List of Natural Resource Management Projects - 2014 (Continued).

Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level
NBVC NR In House		Provide for the recovery, enhancement, and protection of species warranting Navy stewardship, as a proactive strategy to prevent federal listings and continue to resolve baseline biological data gaps.	1
O&MN	63126EPRBird	Provide for the recovery, enhancement, and protection of Xantus's murrelets, as a proactive strategy to prevent federal listings and continue to resolve baseline biological data gaps.	1
O&MN	63126EPRBird	Provide for the recovery, enhancement, and protection of ashy storm-petrels, as a proactive strategy to prevent federal listings and continue to resolve baseline biological data gaps.	1
Navy Tenant Funded	63126XXX93	Maintain a viable population of the San Nicolas Island fox by reducing negative, human-caused impacts and remaining an active participant with other agencies regarding island fox issues.	1
Research Institutions		Determine the status of deer mouse populations and conserve and protect deer mouse habitat.	1
O&MN	63126EPRMarine	Support ongoing and new research on distribution and ecology of the southern sea otter at SNI. Encourage academic institutions to facilitate resource data collection and record all sightings of southern sea otters at SNI and develop a database to track numbers of individuals, time of year, and location.	1
O&MN	69232XXX90	Update and implement the invasive non-native plant species management and eradication program to insure use of existing BMPs to reduce the introduction of invasive species, establish early detection and rapid response protocol, map and prioritize most problematic terrestrial invasive non-native species populations, and maintain consistency with long-term protection of native plant communities.	1
O&MN	6923224086	Develop and implement a biosecurity plan to ensure invasive terrestrial fauna and flora are not brought to SNI by providing prevention, early detection, rapid response, and education guidelines.	1
O&MN	6923224086	Assess and monitor the progress and success of the removal of feral cats to support the shorebird enhancement project.	1
O&MN	63126EPRMarine Invasives	Develop and implement a plan to prevent the introduction of invasive non-native marine and coastal species into SNI waters which includes a standardized monitoring system focused on early detection for high priority aquatic invasive species, rapid response protocol, and promotes when an invasive is detected. Promote cooperative interagency efforts to collect and analyze comprehensive monitoring data.	1
NBVC NR In House		Minimize the introduction of pest species to SNI. Develop a rodent control /removal plan and implement if introduced species are detected. Determine presence or absence of non-native rodents.	1
NBVC NR In House / Research Institutions		Set up a central clearinghouse for data, reports, and publications pertaining to the NBVC's EMS that addresses natural resources and that is accessible to staff.	1
NBVC NR In House		Maintain habitats using principles of ecosystem management and sustainability and continue to use NEPA documentation. Define benefit or impact to the military mission.	1
O&MN	63126EPRClimateChange	Control and reduce greenhouse gas emissions by improving governance, implementing the SNI Net Zero Energy Installation Plan, providing energy conservation education, and addressing impacts in NEPA documents.	1
NBVC NR In House / Project Proponent		Promote training in sustainable design criteria for Navy staff and apply sustainability principles to the management of natural resources and the built environment by using metrics (indicators) of sustainability and by adopting LEED, LID, and Sustainable Sites Initiative approaches while continuing to use RSIP, master planning, site approval, and NEPA processes.	1
NBVC NR In House		Establish protocols for emergency and regular repair of infrastructure so that human life, health and safety are given precedence, but sensitive resources are also protected. Consider fish and wildlife conservation in all site feasibility studies and during project planning, design and construction.	1
NBVC NR In House / Project Proponent		Ensure siting criteria are addressed through the Project Review Board (NBVCINST 11010.1). Any proposed towers will also comply with USFWS guidelines for reducing fatal bird strikes to the greatest extent practicable.	1
NBVC NR In House		Participate in conservation, ecosystem, invasive species, and feral animal control planning in collaboration with other government agencies.	1
NBVC NR In House		Seek out and encourage partners to support independent scientific research and to develop cooperative research agreements focused on examining marine recruitment processes of important indicator species or species of concern.	1
NBVC NR In House		Remain an active participant with other agencies regarding San Nicolas Island fox and San Nicolas Island deer mouse issues.	1
NBVC NR In House		Support the integration of SNI into the Invasive Species Task Force on Santa Cruz Island and other Channel Islands as opportunities arise.	1
NBVC NR In House		Promote cooperative interagency efforts to collect and analyze comprehensive aquatic invasive species monitoring data, including shared funding and staff.	1
NBVC NR In House		Consult with USFWS and CDFG at least annually to fulfill SAIA provisions and related inter-agency cooperative agreements.	1
NBVC NR In House		Consider the use of Cooperative Agreements to get work done, especially research. A long-term advisory relationship and cooperative research relationship could continue with local universities.	1
NBVC NR In House		Establish and implement clear, coherent policies regarding public access to SNI including the near shore environment. Take active measures to discourage trespass and minimize the impacts of unauthorized access.	1

Table C-4. SNI INRMP List of Natural Resource Management Projects - 2014 (Continued).

Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level
NBVC NR In House		Identify natural resource themes for public outreach. Participate in Earth Day and annual science festivals that occur in adjacent communities on the mainland.	1
NBVC NR In House		Ensure consistency with Coastal Zone Plans.	1
NBVC NR In House		Continue to participate in the Project Review Board and the Site Approval and Project Review Process and coordinate with the Cultural Resources program.	1
NBVC NR In House		Continue to use NEPA planning processes and documentation to guide specific projects and document choices and enforce mitigation measures proposed in those NEPA documents.	1
NBVC NR In House		Support research to improve the adequacy of cumulative effects analysis, standardize the format in documents, and develop and implement compensation for cumulative effects.	1
NBVC NR In House		Conserve existing habitat values by promoting experimentation and application of alternative shoreline and underwater habitat structures. Encourage refitting of developed shorelines and existing structures to enhance habitat values.	1
NBVC NR In House		Promote experimentation and application of alternative LID and habitat-friendly landscaped areas adjacent to the shore.	1
NBVC NR In House		Implement this INRMP by applying it as an initial screen for review of projects proposed on the installation from both Navy and outside interests to improve the success of mitigation and enhancement projects based on regulatory, functional, and ecosystem criteria.	1
NBVC NR In House		Enforce Seasonal Avoidance Measures and Standard Mitigation Measures.	1
O&MN	63126EPREducation	Improve SNI community and environmental outreach through facilitating development of environmental education curriculum for researchers, personnel, and contractors. This will be accomplished by developing and distributing educational material, expanding education partnerships, by securing long-term funding to continue environmental education programs (e.g. brochures and videos), and evaluate the effectiveness of existing environmental education programs.	1
NBVC NR In House		Provide information and education for the enforcement of natural resource laws and regulations by professionally trained personnel such as federal and state Conservation Officers.	1
NBVC NR In House		Maintain staff knowledge through training and participation in natural resource research and conservation programs and share information with natural resource experts.	1
NBVC NR In House		Provide a notice of the intent to revise the INRMP to the USFWS and CDFG if a revision is found necessary.	1
NBVC NR In House		Comply with recent CNI draft guidance on INRMPs and continue to utilize the INRMP Metrics Builder to assess implementation.	1
NBVC NR In House		Provide funding and support for research and other studies to further SNI natural resources management.	1
NBVC NR In House		Provide documentation to secure appropriate levels of NBVC NR In House funding to support natural resource management programs.	1
NBVC NR In House		Develop prioritized lists of proposed management efforts to guide development of funding proposals.	1
NBVC NR In House		Develop plans and documentation to secure external funding and continue to request external funding from other state and federal agencies.	1
NBVC NR In House		Support scientific, academic, and volunteer efforts to initiate or supplement natural resources management programs.	1
NBVC NR In House		Identify and ensure departments prioritize and allocate funding to support compliance requirements.	1
NBVC NR In House		Seek awards for natural resource work conducted at SNI.	1
NBVC NR In House		Continue to ensure effective communication, adaptive oversight, and policy leadership through the USDON Natural Resources Strategic Plan.	1

Table C-5. SNI INRMP List of Natural Resource Management Projects - 2015 .

Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level
O&MN	69232B0094	Integrated Natural Resources Management Plan revisions and associated Environmental Assessment to incorporate current resources and management knowledge.	1
NBVC NR In House		Apply sustainability principles to the management of habitats, species, and ecological functions on SNI by identifying resource-specific best practices similar to Sustainable Sites Initiatives (SSI) approaches.	1
NBVC Other Navy In House		Update as needed and implement Storm Water Pollution Prevention Plan (SWPPP).	1
O&MN	63126EPRErosion	Develop and implement an erosion control plan.	1
O&MN	63126EPRFire	Develop and implement a Wildland Fire Management Plan (WFMP) for SNI.	1
O&MN	63126XXX89	Inventory plant species diversity, abundance, and density to develop priorities for monitoring that establishes ranking system, sensitive species habitat, and creates criteria for restoration work while define the extent, nature, and value of vegetation resources of SNI.	1
O&MN	63126EPRDune	Develop and implement a dune drift management plan to determine effective alternatives to manage dune drift impact to roads, operations, and natural resources.	1
O&MN	63126XXX87	Maintain a current inventory of wetlands to support planning and management efforts to achieve no net loss of wetlands.	1
NBVC NR In House		Protect the natural ecological integrity, structure, and functional values of the wetlands and floodplains on SNI.	1
O&MN	63126XXX85	Conduct regular monitoring of reptiles and amphibians in addition to island night lizard monitoring and develop accurate GIS data layers for known populations and conserve habitat associations to avoid sensitive areas and minimize potential impacts.	1
O&MN	63126EPRBird	Migratory and resident bird inventory and restoration management activities to conserve bird population and develop and maintain information on status and trend of population and habitats.	1
O&MN	63126XXX86	Monitor resident seabird populations and breeding colonies to track the sustainability of populations and their habitat.	1
NBVC NR In House		Implement bird conservation principles, measures, and practices through avoidance and minimization measures to protect resident and migratory bird populations.	1
O&MN	63126B0067	Inventory and monitor bat populations on SNI to adapt management strategies based on current population status.	1
O&MN	63126EPRMarine	Develop and implement a marine resource stewardship plan.	1
O&MN	63126XXX88	Monitor island-wide pinniped breeding and haul out sites and periodic evaluation of current adaptive management practices.	1
Navy Tenant Funded	63126B003	Ensure that land use plans and activities in or near threatened or endangered species habitats are accomplished in accordance with the ESA in accordance with current Biological Opinions and with ESA Section 7 Consultation Handbook (USFWS/NMFS March 1998).	1
O&MN	63126B003	Per USFWS Biological Opinion (2001) provide the USFWS an annual report containing the number of island night lizards, California brown pelicans, and western snowy plover killed or injured by Navy activities, and a summary of Navy activities and their effects on listed species in accordance with the Reporting Requirements in the BO (USFWS 2001).	1
O&MN	63126XXX85	Support recovery plan efforts to establish stable island night lizard populations and eventual delisting by conducting site specific surveys prior to disturbance activities, implementing avoidance and minimization measures, and conducting studies to investigate the effectiveness of island night lizard management strategies with respect to impacts from alligator lizards and the relocation island night lizards.	1
Navy Tenant Funded	63126B003	Support recovery plan efforts to establish stable western snowy plover populations and eventual delisting by closing nesting areas to recreational activity during the March 1 - September 15 breeding season and by removing unnecessary structures in nesting areas.	1
Navy Tenant Funded	63126B003	Support recovery plan efforts to establish stable western snowy plover populations and eventual delisting by monitoring the effects of Navy activities on snowy plovers through conducting island-wide snowy plover censuses twice annually, once during the breeding season and once during the winter season, and through monitoring snowy plover nests during missile or target launches, general operations, and other activities that may disturb nesting behaviors.	1
O&MN	63126EPRBlackAb	Support recovery plan efforts to establish stable black abalone populations through continuing to conduct presence and absence surveys and through developing and implementing annual abalone monitoring protocols.	1
O&MN	63126EPRBlackAb	Continue to support appropriate closures at SNI and continue to review all military activities to ensure that they are in compliance with ESA and to avoid or minimize impacts to black abalone.	1
O&MN	63126EPRMarine	Support recovery plan efforts to establish stable white abalone populations by facilitating efforts to identify white abalone habitat and determine densities of individuals around SNI.	1
NBVC NR In House / Research Institutions		Support ongoing and new research on distribution and ecology of the Guadalupe fur seal. Encourage academic institutions to collect resource data. Record all sightings of Guadalupe fur seals and develop a database to track numbers of individuals, time of year, and location.	1
NBVC NR In House		Provide for the recovery, enhancement, and protection of species warranting Navy stewardship, as a proactive strategy to prevent federal listings and continue to resolve baseline biological data gaps.	1
O&MN	63126EPRRare Plant	Collect data on the habitat and reproductive requirements for sensitive endemic plants species for conservation and management efforts.	1

Table C-5. SNI INRMP List of Natural Resource Management Projects - 2015 (Continued).

Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level
O&MN	63126EPRBird	Provide for the recovery, enhancement, and protection of Xantus's murrelets, as a proactive strategy to prevent federal listings and continue to resolve baseline biological data gaps.	1
O&MN	63126EPRBird	Provide for the recovery, enhancement, and protection of ashy storm-petrels, as a proactive strategy to prevent federal listings and continue to resolve baseline biological data gaps.	1
Navy Tenant Funded	63126XXX93	Maintain a viable population of the San Nicolas Island fox by reducing negative, human-caused impacts and remaining an active participant with other agencies regarding island fox issues.	1
Research Institutions		Determine the status of deer mouse populations and conserve and protect deer mouse habitat.	1
O&MN	63126EPRMarine	Support ongoing and new research on distribution and ecology of the southern sea otter at SNI. Encourage academic institutions to facilitate resource data collection and record all sightings of southern sea otters at SNI and develop a database to track numbers of individuals, time of year, and location.	1
O&MN	69232XXX90	Update and implement the invasive non-native plant species management and eradication program to insure use of existing BMPs to reduce the introduction of invasive species, establish early detection and rapid response protocol, map and prioritize most problematic terrestrial invasive non-native species populations, and maintain consistency with long-term protection of native plant communities.	1
O&MN	6923224086	Develop and implement a biosecurity plan to ensure invasive terrestrial fauna and flora are not brought to SNI by providing prevention, early detection, rapid response, and education guidelines.	1
O&MN	6923224086	Assess and monitor the progress and success of the removal of feral cats to support the shorebird enhancement project.	1
O&MN	63126EPRMarine Invasives	Develop and implement a plan to prevent the introduction of invasive non-native marine and coastal species into SNI waters which includes a standardized monitoring system focused on early detection for high priority aquatic invasive species, rapid response protocol, and promotes when an invasive is detected. Promote cooperative interagency efforts to collect and analyze comprehensive monitoring data.	1
Naval Air Operations		Survey and monitor avian species utilizing airfield and document bird strikes and carcasses adjacent to airfield.	1
Naval Air Operations		Develop and implement a BASH Plan and conduct a Wildlife Hazard Assessment for SNI.	1
NBVC NR In House		Minimize the introduction of pest species to SNI. Develop a rodent control /removal plan and implement if introduced species are detected. Determine presence or absence of non-native rodents.	1
NBVC NR In House / Research Institutions		Set up a central clearinghouse for data, reports, and publications pertaining to the NBVC's EMS that addresses natural resources and that is accessible to staff.	1
NBVC NR In House		Maintain habitats using principles of ecosystem management and sustainability and continue to use NEPA documentation. Define benefit or impact to the military mission.	1
O&MN	63126EPRClimateChange	Control and reduce greenhouse gas emissions by improving governance, implementing the SNI Net Zero Energy Installation Plan, providing energy conservation education, and addressing impacts in NEPA documents.	1
NBVC NR In House / NBVC Other Navy In House / Project Proponent		Update and implement the SNI Net Zero Energy Installation Plan to reduce dependency on jet fuel and thereby reducing air and water quality impacts.	1
NBVC NR In House / Project Proponent		Promote training in sustainable design criteria for Navy staff and apply sustainability principles to the management of natural resources and the built environment by using metrics (indicators) of sustainability and by adopting LEED, LID, and Sustainable Sites Initiative approaches while continuing to use RSIP, master planning, site approval, and NEPA processes.	1
NBVC NR In House		Develop and implement a SAP at an organizational level.	1
NBVC NR In House		Establish protocols for emergency and regular repair of infrastructure so that human life, health and safety are given precedence, but sensitive resources are also protected. Consider fish and wildlife conservation in all site feasibility studies and during project planning, design and construction.	1
O&MN	63126EPRRoad	Develop and implement an Island Road Long-term Maintenance Plan that updates and improves road maintenance best management practices, applies the principles of "Integrated Vegetation Management", and adopts mowing instructions to meet multiple objectives for roadside maintenance to alleviate harmful environmental impacts and enhance possible benefits. Adopt a Mowing Instruction that provides roadside fire safety and minimizes detrimental environmental effects. Comply with CWA Section 404 Permit and Section 401 State Water Quality Certification.	1
NBVC NR In House / Project Proponent		Ensure siting criteria are addressed through the Project Review Board (NBVCINST 11010.1.1). Any proposed towers will also comply with USFWS guidelines for reducing fatal bird strikes to the greatest extent practicable.	1
NBVC NR In House		Participate in conservation, ecosystem, invasive species, and feral animal control planning in collaboration with other government agencies.	1
NBVC NR In House		Seek out and encourage partners to support independent scientific research and to develop cooperative research agreements focused on examining marine recruitment processes of important indicator species or species of concern.	1
NBVC NR In House		Remain an active participant with other agencies regarding San Nicolas Island fox and San Nicolas Island deer mouse issues.	1

Table C-5. SNI INRMP List of Natural Resource Management Projects - 2015 (Continued).

Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level
NBVC NR In House		Support the integration of SNI into the Invasive Species Task Force on Santa Cruz Island and other Channel Islands as opportunities arise.	1
NBVC NR In House		Promote cooperative interagency efforts to collect and analyze comprehensive aquatic invasive species monitoring data, including shared funding and staff.	1
NBVC NR In House		Consult with USFWS and CDFG at least annually to fulfill SAIA provisions and related inter-agency cooperative agreements.	1
NBVC NR In House		Consider the use of Cooperative Agreements to get work done, especially research. A long-term advisory relationship and cooperative research relationship could continue with local universities.	1
NBVC NR In House		Establish and implement clear, coherent policies regarding public access to SNI including the near shore environment. Take active measures to discourage trespass and minimize the impacts of unauthorized access.	1
NBVC NR In House		Identify natural resource themes for public outreach. Participate in Earth Day and annual science festivals that occur in adjacent communities on the mainland.	1
NBVC NR In House		Ensure consistency with Coastal Zone Plans.	1
NBVC NR In House		Continue to participate in the Project Review Board and the Site Approval and Project Review Process and coordinate with the Cultural Resources program.	1
NBVC NR In House		Continue to use NEPA planning processes and documentation to guide specific projects and document choices and enforce mitigation measures proposed in those NEPA documents.	1
NBVC NR In House		Revise and implement the Storm Water Pollution Prevention Plan and water quality protection efforts throughout the SNI watershed.	1
NBVC NR In House		Integrate the protection priorities of this INRMP into the Emergency Response Action Plan and the Integrated Contingency Plan for Oil and Hazardous Substance Spill Prevention and Response.	1
NBVC NR In House		Support research to improve the adequacy of cumulative effects analysis, standardize the format in documents, and develop and implement compensation for cumulative effects.	1
NBVC NR In House		Conserve existing habitat values by promoting experimentation and application of alternative shoreline and underwater habitat structures. Encourage refitting of developed shorelines and existing structures to enhance habitat values.	1
NBVC NR In House		Promote experimentation and application of alternative LID and habitat-friendly landscaped areas adjacent to the shore.	1
NBVC NR In House		Implement this INRMP by applying it as an initial screen for review of projects proposed on the installation from both Navy and outside interests to improve the success of mitigation and enhancement projects based on regulatory, functional, and ecosystem criteria.	1
NBVC NR In House		Enforce Seasonal Avoidance Measures and Standard Mitigation Measures.	1
O&MN	63126EPRLandscape	Develop, implement, and revise as needed a Landscaping and Grounds Maintenance Plan and Instruction that outlines an appropriate landscaping and grounds maintenance program (e.g. that considers environmental factors and that adopts an Integrated Pest Management approach) to dealing with pest problems.	1
NBVC NR In House		Develop, implement, and update as need an Outdoor Recreation Plan that identifies and evaluates suitable outdoor recreation opportunities for installation personnel in undeveloped areas and that continues to limit public access and outdoor recreation that are not consistent with the military mission at SNI.	1
O&MN	63126EPREducation	Improve SNI community and environmental outreach through facilitating development of environmental education curriculum for researchers, personnel, and contractors. This will be accomplished by developing and distributing educational material, expanding education partnerships, by securing long-term funding to continue environmental education programs (e.g. brochures and videos), and evaluate the effectiveness of existing environmental education programs.	1
NBVC NR In House		Provide information and education for the enforcement of natural resource laws and regulations by professionally trained personnel such as federal and state Conservation Officers.	1
NBVC NR In House		Maintain staff knowledge through training and participation in natural resource research and conservation programs and share information with natural resource experts.	1
NBVC NR In House		Provide a notice of the intent to revise the INRMP to the USFWS and CDFG if a revision is found necessary.	1
NBVC NR In House		Comply with recent CNI draft guidance on INRMPs and continue to utilize the INRMP Metrics Builder to assess implementation.	1
NBVC NR In House		Provide funding and support for research and other studies to further SNI natural resources management.	1
NBVC NR In House		Provide documentation to secure appropriate levels of NBVC NR In House funding to support natural resource management programs.	1
NBVC NR In House		Develop prioritized lists of proposed management efforts to guide development of funding proposals.	1
NBVC NR In House		Develop plans and documentation to secure external funding and continue to request external funding from other state and federal agencies.	1
NBVC NR In House		Support scientific, academic, and volunteer efforts to initiate or supplement natural resources management programs.	1
NBVC NR In House		Identify and ensure departments prioritize and allocate funding to support compliance requirements.	1
NBVC NR In House		Seek awards for natural resource work conducted at SNI.	1
NBVC NR In House		Continue to ensure effective communication, adaptive oversight, and policy leadership through the USDON Natural Resources Strategic Plan.	1

Table C-6. SNI INRMP List of Natural Resource Management Projects - 2016 .

Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level
O&MN	69232B0094	Integrated Natural Resources Management Plan revisions and associated Environmental Assessment to incorporate current resources and management knowledge.	1
NBVC NR In House		Apply sustainability principles to the management of habitats, species, and ecological functions on SNI by identifying resource-specific best practices similar to Sustainable Sites Initiatives (SSI) approaches.	1
NBVC NR In House		Protect the natural ecological integrity, structure, and functional values of the wetlands and floodplains on SNI.	1
O&MN	63126EPRMarine	Collect baseline information and establish monitoring protocols for sandy beach communities to support management to maintain habitat integrity.	1
O&MN	63126EPRMarine	Continue rocky intertidal surveys and encourage additional monitoring at SNI consistent with monitoring performed at the other Channel Islands and throughout California, to establish regional trends and understand site specific change.	1
O&MN	63126EPRMarine	Develop and implement unvegetated and vegetated soft bottom monitoring protocols at SNI to determine resource status and extent of submerged aquatic vegetation (eelgrass).	1
O&MN	63126EPRMarine	Support establishment of kelp forest ecosystem monitoring locations around SNI while encouraging state and federal agencies and academic researchers to investigate important community related questions involving recruitment, disturbance, and species diversity that help to assess regional trends.	1
NBVC NR In House		Develop management strategies through partnerships with the BLM to support the management of the Begg Rock State Marine Reserve and of the offshore rocks near SNI and Begg Rock that are designated as part of the CCNM.	1
O&MN	63126XXX97	Collect baseline information on the invertebrate community of SNI, with particular emphasis on endemics and pollinators.	1
O&MN	63126XXX85	Conduct regular monitoring of reptiles and amphibians in addition to island night lizard monitoring and develop accurate GIS data layers for known populations and conserve habitat associations to avoid sensitive areas and minimize potential impacts.	1
O&MN	63126EPRBird	Migratory and resident bird inventory and restoration management activities to conserve bird population and develop and maintain information on status and trend of population and habitats.	1
O&MN	63126XXX86	Monitor resident seabird populations and breeding colonies to track the sustainability of populations and their habitat.	1
NBVC NR In House		Implement bird conservation principles, measures, and practices through avoidance and minimization measures to protect resident and migratory bird populations.	1
Research Institutions		Support small mammal monitoring programs at SNI to adapt management strategies based on current population status.	1
O&MN	63126B0067	Inventory and monitor bat populations on SNI to adapt management strategies based on current population status.	1
O&MN	63126EPRMarine	Collect community level marine macroalgae baseline information surveys to support focused management efforts and identify indicator species. Survey subtidal and intertidal areas near high use locations (pier and barge landing areas) for the introduction of non-native invasive species.	1
O&MN	63126EPRMarine	Develop a fish monitoring program and management plan to conserve fish population abundance and habitat diversity.	1
O&MN	63126XXX88	Monitor island-wide pinniped breeding and haul out sites and periodic evaluation of current adaptive management practices.	1
Navy Tenant Funded	63126B003	Ensure that land use plans and activities in or near threatened or endangered species habitats are accomplished in accordance with the ESA in accordance with current Biological Opinions and with ESA Section 7 Consultation Handbook (USFWS/NMFS March 1998).	1
O&MN	63126B003	Per USFWS Biological Opinion (2001) provide the USFWS an annual report containing the number of island night lizards, California brown pelicans, and western snowy plover killed or injured by Navy activities, and a summary of Navy activities and their effects on listed species in accordance with the Reporting Requirements in the BO (USFWS 2001).	1
O&MN	63126XXX85	Support recovery plan efforts to establish stable island night lizard populations and eventual delisting by conducting site specific surveys prior to disturbance activities, implementing avoidance and minimization measures, and conducting studies to investigate the effectiveness of island night lizard management strategies with respect to impacts from alligator lizards and the relocation island night lizards.	1
Navy Tenant Funded	63126B003	Support recovery plan efforts to establish stable western snowy plover populations and eventual delisting by closing nesting areas to recreational activity during the March 1 - September 15 breeding season and by removing unnecessary structures in nesting areas.	1
Navy Tenant Funded	63126B003	Support recovery plan efforts to establish stable western snowy plover populations and eventual delisting by monitoring the effects of Navy activities on snowy plovers through conducting island-wide snowy plover censuses twice annually, once during the breeding season and once during the winter season, and through monitoring snowy plover nests during missile or target launches, general operations, and other activities that may disturb nesting behaviors.	1
O&MN	63126EPRBlackAb	Support recovery plan efforts to establish stable black abalone populations through continuing to conduct presence and absence surveys and through developing and implementing annual abalone monitoring protocols.	1
O&MN	63126EPRBlackAb	Continue to support appropriate closures at SNI and continue to review all military activities to ensure that they are in compliance with ESA and to avoid or minimize impacts to black abalone.	1
O&MN	63126EPRMarine	Support recovery plan efforts to establish stable white abalone populations by facilitating efforts to identify white abalone habitat and determine densities of individuals around SNI.	1

Table C-6. SNI INRMP List of Natural Resource Management Projects - 2016 (Continued).

Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level
NBVC NR In House / Research Institutions		Support ongoing and new research on distribution and ecology of the Guadalupe fur seal. Encourage academic institutions to collect resource data. Record all sightings of Guadalupe fur seals and develop a database to track numbers of individuals, time of year, and location.	1
NBVC NR In House		Provide for the recovery, enhancement, and protection of species warranting Navy stewardship, as a proactive strategy to prevent federal listings and continue to resolve baseline biological data gaps.	1
O&MN	63126XXX97	Collect baseline information on the special status native invertebrate species of SNI.	1
O&MN	63126EPRBird	Provide for the recovery, enhancement, and protection of Xantus's murrelets, as a proactive strategy to prevent federal listings and continue to resolve baseline biological data gaps.	1
O&MN	63126EPRBird	Provide for the recovery, enhancement, and protection of ashy storm-petrels, as a proactive strategy to prevent federal listings and continue to resolve baseline biological data gaps.	1
Navy Tenant Funded	63126XXX93	Maintain a viable population of the San Nicolas Island fox by reducing negative, human-caused impacts and remaining an active participant with other agencies regarding island fox issues.	1
Research Institutions		Determine the status of deer mouse populations and conserve and protect deer mouse habitat.	1
O&MN	63126EPRMarine	Support ongoing and new research on distribution and ecology of the southern sea otter at SNI. Encourage academic institutions to facilitate resource data collection and record all sightings of southern sea otters at SNI and develop a database to track numbers of individuals, time of year, and location.	1
O&MN	69232XXX90	Update and implement the invasive non-native plant species management and eradication program to insure use of existing BMPs to reduce the introduction of invasive species, establish early detection and rapid response protocol, map and prioritize most problematic terrestrial invasive non-native species populations, and maintain consistency with long-term protection of native plant communities.	1
O&MN	6923224086	Develop and implement a biosecurity plan to ensure invasive terrestrial fauna and flora are not brought to SNI by providing prevention, early detection, rapid response, and education guidelines.	1
O&MN	6923224086	Assess and monitor the progress and success of the removal of feral cats to support the shorebird enhancement project.	1
O&MN	63126EPRMarine Invasives	Develop and implement a plan to prevent the introduction of invasive non-native marine and coastal species into SNI waters which includes a standardized monitoring system focused on early detection for high priority aquatic invasive species, rapid response protocol, and promotes when an invasive is detected. Promote cooperative interagency efforts to collect and analyze comprehensive monitoring data.	1
NBVC NR In House		Minimize the introduction of pest species to SNI. Develop a rodent control /removal plan and implement if introduced species are detected. Determine presence or absence of non-native rodents.	1
NBVC NR In House / Research Institutions		Set up a central clearinghouse for data, reports, and publications pertaining to the NBVC's EMS that addresses natural resources and that is accessible to staff.	1
NBVC NR In House		Maintain habitats using principles of ecosystem management and sustainability and continue to use NEPA documentation. Define benefit or impact to the military mission.	1
O&MN	63126EPRClimateChange	Control and reduce greenhouse gas emissions by improving governance, implementing the SNI Net Zero Energy Installation Plan, providing energy conservation education, and addressing impacts in NEPA documents.	1
NBVC NR In House / Project Proponent		Promote training in sustainable design criteria for Navy staff and apply sustainability principles to the management of natural resources and the built environment by using metrics (indicators) of sustainability and by adopting LEED, LID, and Sustainable Sites Initiative approaches while continuing to use RSIP, master planning, site approval, and NEPA processes.	1
NBVC NR In House		Establish protocols for emergency and regular repair of infrastructure so that human life, health and safety are given precedence, but sensitive resources are also protected. Consider fish and wildlife conservation in all site feasibility studies and during project planning, design and construction.	1
NBVC NR In House / Project Proponent		Ensure siting criteria are addressed through the Project Review Board (NBVCINST 11010.1). Any proposed towers will also comply with USFWS guidelines for reducing fatal bird strikes to the greatest extent practicable.	1
NBVC NR In House		Participate in conservation, ecosystem, invasive species, and feral animal control planning in collaboration with other government agencies.	1
NBVC NR In House		Seek out and encourage partners to support independent scientific research and to develop cooperative research agreements focused on examining marine recruitment processes of important indicator species or species of concern.	1
NBVC NR In House		Remain an active participant with other agencies regarding San Nicolas Island fox and San Nicolas Island deer mouse issues.	1
NBVC NR In House		Support the integration of SNI into the Invasive Species Task Force on Santa Cruz Island and other Channel Islands as opportunities arise.	1
NBVC NR In House		Promote cooperative interagency efforts to collect and analyze comprehensive aquatic invasive species monitoring data, including shared funding and staff.	1
NBVC NR In House		Consult with USFWS and CDFG at least annually to fulfill SAIA provisions and related inter-agency cooperative agreements.	1
NBVC NR In House		Consider the use of Cooperative Agreements to get work done, especially research. A long-term advisory relationship and cooperative research relationship could continue with local universities.	1

Table C-6. SNI INRMP List of Natural Resource Management Projects - 2016 (Continued).

Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level
NBVC NR In House		Establish and implement clear, coherent policies regarding public access to SNI including the near shore environment. Take active measures to discourage trespass and minimize the impacts of unauthorized access.	1
NBVC NR In House		Identify natural resource themes for public outreach. Participate in Earth Day and annual science festivals that occur in adjacent communities on the mainland.	1
NBVC NR In House		Ensure consistency with Coastal Zone Plans.	1
NBVC NR In House		Continue to participate in the Project Review Board and the Site Approval and Project Review Process and coordinate with the Cultural Resources program.	1
NBVC NR In House		Continue to use NEPA planning processes and documentation to guide specific projects and document choices and enforce mitigation measures proposed in those NEPA documents.	1
NBVC NR In House		Collect and distribute data on sediment contamination to minimize risks to recreational and commercial water contact users, recreational and commercial fisheries, and to wildlife species.	1
NBVC NR In House		Support research to improve the adequacy of cumulative effects analysis, standardize the format in documents, and develop and implement compensation for cumulative effects.	1
NBVC NR In House		Conserve existing habitat values by promoting experimentation and application of alternative shoreline and underwater habitat structures. Encourage refitting of developed shorelines and existing structures to enhance habitat values.	1
NBVC NR In House		Promote experimentation and application of alternative LID and habitat-friendly landscaped areas adjacent to the shore.	1
NBVC NR In House		Implement this INRMP by applying it as an initial screen for review of projects proposed on the installation from both Navy and outside interests to improve the success of mitigation and enhancement projects based on regulatory, functional, and ecosystem criteria.	1
NBVC NR In House		Enforce Seasonal Avoidance Measures and Standard Mitigation Measures.	1
O&MN	63126EPREducation	Improve SNI community and environmental outreach through facilitating development of environmental education curriculum for researchers, personnel, and contractors. This will be accomplished by developing and distributing educational material, expanding education partnerships, by securing long-term funding to continue environmental education programs (e.g. brochures and videos), and evaluate the effectiveness of existing environmental education programs.	1
NBVC NR In House		Provide information and education for the enforcement of natural resource laws and regulations by professionally trained personnel such as federal and state Conservation Officers.	1
NBVC NR In House		Maintain staff knowledge through training and participation in natural resource research and conservation programs and share information with natural resource experts.	1
NBVC NR In House		Provide a notice of the intent to revise the INRMP to the USFWS and CDFG if a revision is found necessary.	1
NBVC NR In House		Comply with recent CNI draft guidance on INRMPs and continue to utilize the INRMP Metrics Builder to assess implementation.	1
NBVC NR In House		Provide funding and support for research and other studies to further SNI natural resources management.	1
NBVC NR In House		Provide documentation to secure appropriate levels of NBVC NR In House funding to support natural resource management programs.	1
NBVC NR In House		Develop prioritized lists of proposed management efforts to guide development of funding proposals.	1
NBVC NR In House		Develop plans and documentation to secure external funding and continue to request external funding from other state and federal agencies.	1
NBVC NR In House		Support scientific, academic, and volunteer efforts to initiate or supplement natural resources management programs.	1
NBVC NR In House		Identify and ensure departments prioritize and allocate funding to support compliance requirements.	1
NBVC NR In House		Seek awards for natural resource work conducted at SNI.	1
NBVC NR In House		Continue to ensure effective communication, adaptive oversight, and policy leadership through the USDON Natural Resources Strategic Plan.	1

Table C-7. SNI INRMP List of Natural Resource Management Projects - 2017 .

Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level
O&MN	69232B0094	Integrated Natural Resources Management Plan revisions and associated Environmental Assessment to incorporate current resources and management knowledge.	1
NBVC NR In House		Apply sustainability principles to the management of habitats, species, and ecological functions on SNI by identifying resource-specific best practices similar to Sustainable Sites Initiatives (SSI) approaches.	1
NBVC NR In House		Protect the natural ecological integrity, structure, and functional values of the wetlands and floodplains on SNI.	1
O&MN	63126XXX85	Conduct regular monitoring of reptiles and amphibians in addition to island night lizard monitoring and develop accurate GIS data layers for known populations and conserve habitat associations to avoid sensitive areas and minimize potential impacts.	1
O&MN	63126EPRBird	Migratory and resident bird inventory and restoration management activities to conserve bird population and develop and maintain information on status and trend of population and habitats.	1
O&MN	63126XXX86	Monitor resident seabird populations and breeding colonies to track the sustainability of populations and their habitat.	1
NBVC NR In House		Implement bird conservation principles, measures, and practices through avoidance and minimization measures to protect resident and migratory bird populations.	1
O&MN	63126B0067	Inventory and monitor bat populations on SNI to adapt management strategies based on current population status.	1
O&MN	63126XXX88	Monitor island-wide pinniped breeding and haul out sites and periodic evaluation of current adaptive management practices.	1
Navy Tenant Funded	63126B003	Ensure that land use plans and activities in or near threatened or endangered species habitats are accomplished in accordance with the ESA in accordance with current Biological Opinions and with ESA Section 7 Consultation Handbook (USFWS/NMFS March 1998).	1
O&MN	63126B003	Per USFWS Biological Opinion (2001) provide the USFWS an annual report containing the number of island night lizards, California brown pelicans, and western snowy plover killed or injured by Navy activities, and a summary of Navy activities and their effects on listed species in accordance with the Reporting Requirements in the BO (USFWS 2001).	1
O&MN	63126XXX85	Support recovery plan efforts to establish stable island night lizard populations and eventual delisting by conducting site specific surveys prior to disturbance activities, implementing avoidance and minimization measures, and conducting studies to investigate the effectiveness of island night lizard management strategies with respect to impacts from alligator lizards and the relocation island night lizards.	1
Navy Tenant Funded	63126B003	Support recovery plan efforts to establish stable western snowy plover populations and eventual delisting by closing nesting areas to recreational activity during the March 1 - September 15 breeding season and by removing unnecessary structures in nesting areas.	1
Navy Tenant Funded	63126B003	Support recovery plan efforts to establish stable western snowy plover populations and eventual delisting by monitoring the effects of Navy activities on snowy plovers through conducting island-wide snowy plover censuses twice annually, once during the breeding season and once during the winter season, and through monitoring snowy plover nests during missile or target launches, general operations, and other activities that may disturb nesting behaviors.	1
O&MN	63126EPRBlackAb	Support recovery plan efforts to establish stable black abalone populations through continuing to conduct presence and absence surveys and through developing and implementing annual abalone monitoring protocols.	1
O&MN	63126EPRBlackAb	Continue to support appropriate closures at SNI and continue to review all military activities to ensure that they are in compliance with ESA and to avoid or minimize impacts to black abalone.	1
O&MN	63126EPRMarine	Support recovery plan efforts to establish stable white abalone populations by facilitating efforts to identify white abalone habitat and determine densities of individuals around SNI.	1
NBVC NR In House / Research Institutions		Support ongoing and new research on distribution and ecology of the Guadalupe fur seal. Encourage academic institutions to collect resource data. Record all sightings of Guadalupe fur seals and develop a database to track numbers of individuals, time of year, and location.	1
NBVC NR In House		Provide for the recovery, enhancement, and protection of species warranting Navy stewardship, as a proactive strategy to prevent federal listings and continue to resolve baseline biological data gaps.	1
O&MN	63126EPRBird	Provide for the recovery, enhancement, and protection of Xantus's murrelets, as a proactive strategy to prevent federal listings and continue to resolve baseline biological data gaps.	1
O&MN	63126EPRBird	Provide for the recovery, enhancement, and protection of ashy storm-petrels, as a proactive strategy to prevent federal listings and continue to resolve baseline biological data gaps.	1
Navy Tenant Funded	63126XXX93	Maintain a viable population of the San Nicolas Island fox by reducing negative, human-caused impacts and remaining an active participant with other agencies regarding island fox issues.	1
Research Institutions		Determine the status of deer mouse populations and conserve and protect deer mouse habitat.	1
O&MN	63126EPRMarine	Support ongoing and new research on distribution and ecology of the southern sea otter at SNI. Encourage academic institutions to facilitate resource data collection and record all sightings of southern sea otters at SNI and develop a database to track numbers of individuals, time of year, and location.	1

Table C-7. SNI INRMP List of Natural Resource Management Projects - 2017 (Continued).

Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level
O&MN	69232XXX90	Update and implement the invasive non-native plant species management and eradication program to insure use of existing BMPs to reduce the introduction of invasive species, establish early detection and rapid response protocol, map and prioritize most problematic terrestrial invasive non-native species populations, and maintain consistency with long-term protection of native plant communities.	1
O&MN	6923224086	Develop and implement a biosecurity plan to ensure invasive terrestrial fauna and flora are not brought to SNI by providing prevention, early detection, rapid response, and education guidelines.	1
O&MN	6923224086	Assess and monitor the progress and success of the removal of feral cats to support the shorebird enhancement project.	1
O&MN	63126EPRMarine Invasives	Develop and implement a plan to prevent the introduction of invasive non-native marine and coastal species into SNI waters which includes a standardized monitoring system focused on early detection for high priority aquatic invasive species, rapid response protocol, and promotes when an invasive is detected. Promote cooperative interagency efforts to collect and analyze comprehensive monitoring data.	1
NBVC NR In House		Minimize the introduction of pest species to SNI. Develop a rodent control /removal plan and implement if introduced species are detected. Determine presence or absence of non-native rodents.	1
NBVC NR In House / Research Institutions		Set up a central clearinghouse for data, reports, and publications pertaining to the NBVC's EMS that addresses natural resources and that is accessible to staff.	1
NBVC NR In House		Maintain habitats using principles of ecosystem management and sustainability and continue to use NEPA documentation. Define benefit or impact to the military mission.	1
O&MN	63126EPRClimateChange	Control and reduce greenhouse gas emissions by improving governance, implementing the SNI Net Zero Energy Installation Plan, providing energy conservation education, and addressing impacts in NEPA documents.	1
NBVC NR In House / Project Proponent		Promote training in sustainable design criteria for Navy staff and apply sustainability principles to the management of natural resources and the built environment by using metrics (indicators) of sustainability and by adopting LEED, LID, and Sustainable Sites Initiative approaches while continuing to use RSIP, master planning, site approval, and NEPA processes.	1
NBVC NR In House		Establish protocols for emergency and regular repair of infrastructure so that human life, health and safety are given precedence, but sensitive resources are also protected. Consider fish and wildlife conservation in all site feasibility studies and during project planning, design and construction.	1
NBVC NR In House / Project Proponent		Ensure siting criteria are addressed through the Project Review Board (NBVCINST 11010.1). Any proposed towers will also comply with USFWS guidelines for reducing fatal bird strikes to the greatest extent practicable.	1
NBVC NR In House		Participate in conservation, ecosystem, invasive species, and feral animal control planning in collaboration with other government agencies.	1
NBVC NR In House		Seek out and encourage partners to support independent scientific research and to develop cooperative research agreements focused on examining marine recruitment processes of important indicator species or species of concern.	1
NBVC NR In House		Remain an active participant with other agencies regarding San Nicolas Island fox and San Nicolas Island deer mouse issues.	1
NBVC NR In House		Support the integration of SNI into the Invasive Species Task Force on Santa Cruz Island and other Channel Islands as opportunities arise.	1
NBVC NR In House		Promote cooperative interagency efforts to collect and analyze comprehensive aquatic invasive species monitoring data, including shared funding and staff.	1
NBVC NR In House		Consult with USFWS and CDFG at least annually to fulfill SAIA provisions and related inter-agency cooperative agreements.	1
NBVC NR In House		Consider the use of Cooperative Agreements to get work done, especially research. A long-term advisory relationship and cooperative research relationship could continue with local universities.	1
NBVC NR In House		Establish and implement clear, coherent policies regarding public access to SNI including the near shore environment. Take active measures to discourage trespass and minimize the impacts of unauthorized access.	1
NBVC NR In House		Identify natural resource themes for public outreach. Participate in Earth Day and annual science festivals that occur in adjacent communities on the mainland.	1
NBVC NR In House		Ensure consistency with Coastal Zone Plans.	1
NBVC NR In House		Continue to participate in the Project Review Board and the Site Approval and Project Review Process and coordinate with the Cultural Resources program.	1
NBVC NR In House		Continue to use NEPA planning processes and documentation to guide specific projects and document choices and enforce mitigation measures proposed in those NEPA documents.	1
NBVC NR In House		Support research to improve the adequacy of cumulative effects analysis, standardize the format in documents, and develop and implement compensation for cumulative effects.	1
NBVC NR In House		Conserve existing habitat values by promoting experimentation and application of alternative shoreline and underwater habitat structures. Encourage refitting of developed shorelines and existing structures to enhance habitat values.	1
NBVC NR In House		Promote experimentation and application of alternative LID and habitat-friendly landscaped areas adjacent to the shore.	1

Table C-7. SNI INRMP List of Natural Resource Management Projects - 2017 (Continued).

Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level
NBVC NR In House		Implement this INRMP by applying it as an initial screen for review of projects proposed on the installation from both Navy and outside interests to improve the success of mitigation and enhancement projects based on regulatory, functional, and ecosystem criteria.	1
NBVC NR In House		Enforce Seasonal Avoidance Measures and Standard Mitigation Measures.	1
O&MN	63126EPREducation	Improve SNI community and environmental outreach through facilitating development of environmental education curriculum for researchers, personnel, and contractors. This will be accomplished by developing and distributing educational material, expanding education partnerships, by securing long-term funding to continue environmental education programs (e.g. brochures and videos), and evaluate the effectiveness of existing environmental education programs.	1
NBVC NR In House		Provide information and education for the enforcement of natural resource laws and regulations by professionally trained personnel such as federal and state Conservation Officers.	1
NBVC NR In House		Maintain staff knowledge through training and participation in natural resource research and conservation programs and share information with natural resource experts.	1
NBVC NR In House		Provide a notice of the intent to revise the INRMP to the USFWS and CDFG if a revision is found necessary.	1
NBVC NR In House		Comply with recent CNI draft guidance on INRMPs and continue to utilize the INRMP Metrics Builder to assess implementation.	1
NBVC NR In House		Provide funding and support for research and other studies to further SNI natural resources management.	1
NBVC NR In House		Provide documentation to secure appropriate levels of NBVC NR In House funding to support natural resource management programs.	1
NBVC NR In House		Develop prioritized lists of proposed management efforts to guide development of funding proposals.	1
NBVC NR In House		Develop plans and documentation to secure external funding and continue to request external funding from other state and federal agencies.	1
NBVC NR In House		Support scientific, academic, and volunteer efforts to initiate or supplement natural resources management programs.	1
NBVC NR In House		Identify and ensure departments prioritize and allocate funding to support compliance requirements.	1
NBVC NR In House		Seek awards for natural resource work conducted at SNI.	1
NBVC NR In House		Continue to ensure effective communication, adaptive oversight, and policy leadership through the USDON Natural Resources Strategic Plan.	1

Table C-8. SNI INRMP List of Natural Resource Management Projects - 2018 .

Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level
O&MN	69232B0094	Integrated Natural Resources Management Plan revisions and associated Environmental Assessment to incorporate current resources and management knowledge.	1
NBVC NR In House		Apply sustainability principles to the management of habitats, species, and ecological functions on SNI by identifying resource-specific best practices similar to Sustainable Sites Initiatives (SSI) approaches.	1
NBVC NR In House		Protect the natural ecological integrity, structure, and functional values of the wetlands and floodplains on SNI.	1
O&MN	63126EPRMarine	Collect baseline information and establish monitoring protocols for sandy beach communities to support management to maintain habitat integrity.	1
O&MN	63126EPRMarine	Continue rocky intertidal surveys and encourage additional monitoring at SNI consistent with monitoring performed at the other Channel Islands and throughout California, to establish regional trends and understand site specific change.	1
O&MN	63126EPRMarine	Develop and implement unvegetated and vegetated soft bottom monitoring protocols at SNI to determine resource status and extent of submerged aquatic vegetation (eelgrass).	1
O&MN	63126EPRMarine	Support establishment of kelp forest ecosystem monitoring locations around SNI while encouraging state and federal agencies and academic researchers to investigate important community related questions involving recruitment, disturbance, and species diversity that help to assess regional trends.	1
NBVC NR In House		Develop management strategies through partnerships with the BLM to support the management of the Begg Rock State Marine Reserve and of the offshore rocks near SNI and Begg Rock that are designated as part of the CCNM.	1
O&MN	63126XXX85	Conduct regular monitoring of reptiles and amphibians in addition to island night lizard monitoring and develop accurate GIS data layers for known populations and conserve habitat associations to avoid sensitive areas and minimize potential impacts.	1
O&MN	63126EPRBird	Migratory and resident bird inventory and restoration management activities to conserve bird population and develop and maintain information on status and trend of population and habitats.	1
O&MN	63126XXX86	Monitor resident seabird populations and breeding colonies to track the sustainability of populations and their habitat.	1
NBVC NR In House		Implement bird conservation principles, measures, and practices through avoidance and minimization measures to protect resident and migratory bird populations.	1
O&MN	63126B0067	Inventory and monitor bat populations on SNI to adapt management strategies based on current population status.	1
O&MN	63126EPRMarine	Collect community level marine macroalgae baseline information surveys to support focused management efforts and identify indicator species. Survey subtidal and intertidal areas near high use locations (pier and barge landing areas) for the introduction of non-native invasive species.	1
O&MN	63126XXX88	Monitor island-wide pinniped breeding and haul out sites and periodic evaluation of current adaptive management practices.	1
Navy Tenant Funded	63126B003	Ensure that land use plans and activities in or near threatened or endangered species habitats are accomplished in accordance with the ESA in accordance with current Biological Opinions and with ESA Section 7 Consultation Handbook (USFWS/NMFS March 1998).	1
O&MN	63126B003	Per USFWS Biological Opinion (2001) provide the USFWS an annual report containing the number of island night lizards, California brown pelicans, and western snowy plover killed or injured by Navy activities, and a summary of Navy activities and their effects on listed species in accordance with the Reporting Requirements in the BO (USFWS 2001).	1
O&MN	63126XXX85	Support recovery plan efforts to establish stable island night lizard populations and eventual delisting by conducting site specific surveys prior to disturbance activities, implementing avoidance and minimization measures, and conducting studies to investigate the effectiveness of island night lizard management strategies with respect to impacts from alligator lizards and the relocation island night lizards.	1
Navy Tenant Funded	63126B003	Support recovery plan efforts to establish stable western snowy plover populations and eventual delisting by closing nesting areas to recreational activity during the March 1 - September 15 breeding season and by removing unnecessary structures in nesting areas.	1
Navy Tenant Funded	63126B003	Support recovery plan efforts to establish stable western snowy plover populations and eventual delisting by monitoring the effects of Navy activities on snowy plovers through conducting island-wide snowy plover censuses twice annually, once during the breeding season and once during the winter season, and through monitoring snowy plover nests during missile or target launches, general operations, and other activities that may disturb nesting behaviors.	1
O&MN	63126EPRBlackAb	Support recovery plan efforts to establish stable black abalone populations through continuing to conduct presence and absence surveys and through developing and implementing annual abalone monitoring protocols.	1
O&MN	63126EPRBlackAb	Continue to support appropriate closures at SNI and continue to review all military activities to ensure that they are in compliance with ESA and to avoid or minimize impacts to black abalone.	1
O&MN	63126EPRMarine	Support recovery plan efforts to establish stable white abalone populations by facilitating efforts to identify white abalone habitat and determine densities of individuals around SNI.	1
NBVC NR In House / Research Institutions		Support ongoing and new research on distribution and ecology of the Guadalupe fur seal. Encourage academic institutions to collect resource data. Record all sightings of Guadalupe fur seals and develop a database to track numbers of individuals, time of year, and location.	1

Table C-8. SNI INRMP List of Natural Resource Management Projects - 2018 (Continued).

Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level
NBVC NR In House		Provide for the recovery, enhancement, and protection of species warranting Navy stewardship, as a proactive strategy to prevent federal listings and continue to resolve baseline biological data gaps.	1
O&MN	63126EPRBird	Provide for the recovery, enhancement, and protection of Xantus's murrelets, as a proactive strategy to prevent federal listings and continue to resolve baseline biological data gaps.	1
O&MN	63126EPRBird	Provide for the recovery, enhancement, and protection of ashy storm-petrels, as a proactive strategy to prevent federal listings and continue to resolve baseline biological data gaps.	1
Navy Tenant Funded	63126XXX93	Maintain a viable population of the San Nicolas Island fox by reducing negative, human-caused impacts and remaining an active participant with other agencies regarding island fox issues.	1
Research Institutions		Determine the status of deer mouse populations and conserve and protect deer mouse habitat.	1
O&MN	63126EPRMarine	Support ongoing and new research on distribution and ecology of the southern sea otter at SNI. Encourage academic institutions to facilitate resource data collection and record all sightings of southern sea otters at SNI and develop a database to track numbers of individuals, time of year, and location.	1
O&MN	69232XXX90	Update and implement the invasive non-native plant species management and eradication program to insure use of existing BMPs to reduce the introduction of invasive species, establish early detection and rapid response protocol, map and prioritize most problematic terrestrial invasive non-native species populations, and maintain consistency with long-term protection of native plant communities.	1
O&MN	6923224086	Develop and implement a biosecurity plan to ensure invasive terrestrial fauna and flora are not brought to SNI by providing prevention, early detection, rapid response, and education guidelines.	1
O&MN	6923224086	Assess and monitor the progress and success of the removal of feral cats to support the shorebird enhancement project.	1
O&MN	63126EPRMarine Invasives	Develop and implement a plan to prevent the introduction of invasive non-native marine and coastal species into SNI waters which includes a standardized monitoring system focused on early detection for high priority aquatic invasive species, rapid response protocol, and promotes when an invasive is detected. Promote cooperative interagency efforts to collect and analyze comprehensive monitoring data.	1
NBVC NR In House		Minimize the introduction of pest species to SNI. Develop a rodent control /removal plan and implement if introduced species are detected. Determine presence or absence of non-native rodents.	1
NBVC NR In House / Research Institutions		Set up a central clearinghouse for data, reports, and publications pertaining to the NBVC's EMS that addresses natural resources and that is accessible to staff.	1
NBVC NR In House		Maintain habitats using principles of ecosystem management and sustainability and continue to use NEPA documentation. Define benefit or impact to the military mission.	1
O&MN	63126EPRClimateChange	Control and reduce greenhouse gas emissions by improving governance, implementing the SNI Net Zero Energy Installation Plan, providing energy conservation education, and addressing impacts in NEPA documents.	1
NBVC NR In House / Project Proponent		Promote training in sustainable design criteria for Navy staff and apply sustainability principles to the management of natural resources and the built environment by using metrics (indicators) of sustainability and by adopting LEED, LID, and Sustainable Sites Initiative approaches while continuing to use RSIP, master planning, site approval, and NEPA processes.	1
NBVC NR In House		Establish protocols for emergency and regular repair of infrastructure so that human life, health and safety are given precedence, but sensitive resources are also protected. Consider fish and wildlife conservation in all site feasibility studies and during project planning, design and construction.	1
NBVC NR In House / Project Proponent		Ensure siting criteria are addressed through the Project Review Board (NBVCINST 11010.1). Any proposed towers will also comply with USFWS guidelines for reducing fatal bird strikes to the greatest extent practicable.	1
NBVC NR In House		Participate in conservation, ecosystem, invasive species, and feral animal control planning in collaboration with other government agencies.	1
NBVC NR In House		Seek out and encourage partners to support independent scientific research and to develop cooperative research agreements focused on examining marine recruitment processes of important indicator species or species of concern.	1
NBVC NR In House		Remain an active participant with other agencies regarding San Nicolas Island fox and San Nicolas Island deer mouse issues.	1
NBVC NR In House		Support the integration of SNI into the Invasive Species Task Force on Santa Cruz Island and other Channel Islands as opportunities arise.	1
NBVC NR In House		Promote cooperative interagency efforts to collect and analyze comprehensive aquatic invasive species monitoring data, including shared funding and staff.	1
NBVC NR In House		Consult with USFWS and CDFG at least annually to fulfill SAIA provisions and related inter-agency cooperative agreements.	1
NBVC NR In House		Consider the use of Cooperative Agreements to get work done, especially research. A long-term advisory relationship and cooperative research relationship could continue with local universities.	1
NBVC NR In House		Establish and implement clear, coherent policies regarding public access to SNI including the near shore environment. Take active measures to discourage trespass and minimize the impacts of unauthorized access.	1

Table C-8. SNI INRMP List of Natural Resource Management Projects - 2018 (Continued).

Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level
NBVC NR In House		Identify natural resource themes for public outreach. Participate in Earth Day and annual science festivals that occur in adjacent communities on the mainland.	1
NBVC NR In House		Ensure consistency with Coastal Zone Plans.	1
NBVC NR In House		Continue to participate in the Project Review Board and the Site Approval and Project Review Process and coordinate with the Cultural Resources program.	1
NBVC NR In House		Continue to use NEPA planning processes and documentation to guide specific projects and document choices and enforce mitigation measures proposed in those NEPA documents.	1
NBVC NR In House		Support research to improve the adequacy of cumulative effects analysis, standardize the format in documents, and develop and implement compensation for cumulative effects.	1
NBVC NR In House		Conserve existing habitat values by promoting experimentation and application of alternative shoreline and underwater habitat structures. Encourage refitting of developed shorelines and existing structures to enhance habitat values.	1
NBVC NR In House		Promote experimentation and application of alternative LID and habitat-friendly landscaped areas adjacent to the shore.	1
NBVC NR In House		Implement this INRMP by applying it as an initial screen for review of projects proposed on the installation from both Navy and outside interests to improve the success of mitigation and enhancement projects based on regulatory, functional, and ecosystem criteria.	1
NBVC NR In House		Enforce Seasonal Avoidance Measures and Standard Mitigation Measures.	1
O&MN	63126EPREducation	Improve SNI community and environmental outreach through facilitating development of environmental education curriculum for researchers, personnel, and contractors. This will be accomplished by developing and distributing educational material, expanding education partnerships, by securing long-term funding to continue environmental education programs (e.g. brochures and videos), and evaluate the effectiveness of existing environmental education programs.	1
NBVC NR In House		Provide information and education for the enforcement of natural resource laws and regulations by professionally trained personnel such as federal and state Conservation Officers.	1
NBVC NR In House		Maintain staff knowledge through training and participation in natural resource research and conservation programs and share information with natural resource experts.	1
NBVC NR In House		Provide a notice of the intent to revise the INRMP to the USFWS and CDFG if a revision is found necessary.	1
NBVC NR In House		Comply with recent CNI draft guidance on INRMPs and continue to utilize the INRMP Metrics Builder to assess implementation.	1
NBVC NR In House		Provide funding and support for research and other studies to further SNI natural resources management.	1
NBVC NR In House		Provide documentation to secure appropriate levels of NBVC NR In House funding to support natural resource management programs.	1
NBVC NR In House		Develop prioritized lists of proposed management efforts to guide development of funding proposals.	1
NBVC NR In House		Develop plans and documentation to secure external funding and continue to request external funding from other state and federal agencies.	1
NBVC NR In House		Support scientific, academic, and volunteer efforts to initiate or supplement natural resources management programs.	1
NBVC NR In House		Identify and ensure departments prioritize and allocate funding to support compliance requirements.	1
NBVC NR In House		Seek awards for natural resource work conducted at SNI.	1
NBVC NR In House		Continue to ensure effective communication, adaptive oversight, and policy leadership through the USDON Natural Resources Strategic Plan.	1

Table C-9. SNI INRMP List of Natural Resource Management Projects - 2019 .

Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level
O&MN	69232B0094	Integrated Natural Resources Management Plan revisions and associated Environmental Assessment to incorporate current resources and management knowledge.	1
NBVC NR In House		Apply sustainability principles to the management of habitats, species, and ecological functions on SNI by identifying resource-specific best practices similar to Sustainable Sites Initiatives (SSI) approaches.	1
NBVC NR In House		Protect the natural ecological integrity, structure, and functional values of the wetlands and floodplains on SNI.	1
O&MN	63126XXX97	Collect baseline information on the invertebrate community of SNI, with particular emphasis on endemics and pollinators.	1
O&MN	63126XXX85	Conduct regular monitoring of reptiles and amphibians in addition to island night lizard monitoring and develop accurate GIS data layers for known populations and conserve habitat associations to avoid sensitive areas and minimize potential impacts.	1
O&MN	63126EPRBird	Migratory and resident bird inventory and restoration management activities to conserve bird population and develop and maintain information on status and trend of population and habitats.	1
O&MN	63126XXX86	Monitor resident seabird populations and breeding colonies to track the sustainability of populations and their habitat.	1
NBVC NR In House		Implement bird conservation principles, measures, and practices through avoidance and minimization measures to protect resident and migratory bird populations.	1
Research Institutions		Support small mammal monitoring programs at SNI to adapt management strategies based on current population status.	1
O&MN	63126B0067	Inventory and monitor bat populations on SNI to adapt management strategies based on current population status.	1
O&MN	63126EPRMarine	Develop a fish monitoring program and management plan to conserve fish population abundance and habitat diversity.	1
O&MN	63126XXX88	Monitor island-wide pinniped breeding and haul out sites and periodic evaluation of current adaptive management practices.	1
Navy Tenant Funded	63126B003	Ensure that land use plans and activities in or near threatened or endangered species habitats are accomplished in accordance with the ESA in accordance with current Biological Opinions and with ESA Section 7 Consultation Handbook (USFWS/NMFS March 1998).	1
O&MN	63126B003	Per USFWS Biological Opinion (2001) provide the USFWS an annual report containing the number of island night lizards, California brown pelicans, and western snowy plover killed or injured by Navy activities, and a summary of Navy activities and their effects on listed species in accordance with the Reporting Requirements in the BO (USFWS 2001).	1
O&MN	63126XXX85	Support recovery plan efforts to establish stable island night lizard populations and eventual delisting by conducting site specific surveys prior to disturbance activities, implementing avoidance and minimization measures, and conducting studies to investigate the effectiveness of island night lizard management strategies with respect to impacts from alligator lizards and the relocation island night lizards.	1
Navy Tenant Funded	63126B003	Support recovery plan efforts to establish stable western snowy plover populations and eventual delisting by closing nesting areas to recreational activity during the March 1 - September 15 breeding season and by removing unnecessary structures in nesting areas.	1
Navy Tenant Funded	63126B003	Support recovery plan efforts to establish stable western snowy plover populations and eventual delisting by monitoring the effects of Navy activities on snowy plovers through conducting island-wide snowy plover censuses twice annually, once during the breeding season and once during the winter season, and through monitoring snowy plover nests during missile or target launches, general operations, and other activities that may disturb nesting behaviors.	1
O&MN	63126EPRBlackAb	Support recovery plan efforts to establish stable black abalone populations through continuing to conduct presence and absence surveys and through developing and implementing annual abalone monitoring protocols.	1
O&MN	63126EPRBlackAb	Continue to support appropriate closures at SNI and continue to review all military activities to ensure that they are in compliance with ESA and to avoid or minimize impacts to black abalone.	1
O&MN	63126EPRMarine	Support recovery plan efforts to establish stable white abalone populations by facilitating efforts to identify white abalone habitat and determine densities of individuals around SNI.	1
NBVC NR In House / Research Institutions		Support ongoing and new research on distribution and ecology of the Guadalupe fur seal. Encourage academic institutions to collect resource data. Record all sightings of Guadalupe fur seals and develop a database to track numbers of individuals, time of year, and location.	1
NBVC NR In House		Provide for the recovery, enhancement, and protection of species warranting Navy stewardship, as a proactive strategy to prevent federal listings and continue to resolve baseline biological data gaps.	1
O&MN	63126XXX97	Collect baseline information on the special status native invertebrate species of SNI.	1
O&MN	63126EPRBird	Provide for the recovery, enhancement, and protection of Xantus's murrelets, as a proactive strategy to prevent federal listings and continue to resolve baseline biological data gaps.	1
O&MN	63126EPRBird	Provide for the recovery, enhancement, and protection of ashy storm-petrels, as a proactive strategy to prevent federal listings and continue to resolve baseline biological data gaps.	1

Table C-9. SNI INRMP List of Natural Resource Management Projects - 2019 (Continued).

Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level
Navy Tenant Funded	63126XXX93	Maintain a viable population of the San Nicolas Island fox by reducing negative, human-caused impacts and remaining an active participant with other agencies regarding island fox issues.	1
Research Institutions		Determine the status of deer mouse populations and conserve and protect deer mouse habitat.	1
O&MN	63126EPRMarine	Support ongoing and new research on distribution and ecology of the southern sea otter at SNI. Encourage academic institutions to facilitate resource data collection and record all sightings of southern sea otters at SNI and develop a database to track numbers of individuals, time of year, and location.	1
O&MN	69232XXX90	Update and implement the invasive non-native plant species management and eradication program to insure use of existing BMPs to reduce the introduction of invasive species, establish early detection and rapid response protocol, map and prioritize most problematic terrestrial invasive non-native species populations, and maintain consistency with long-term protection of native plant communities.	1
O&MN	6923224086	Develop and implement a biosecurity plan to ensure invasive terrestrial fauna and flora are not brought to SNI by providing prevention, early detection, rapid response, and education guidelines.	1
O&MN	6923224086	Assess and monitor the progress and success of the removal of feral cats to support the shorebird enhancement project.	1
O&MN	63126EPRMarine Invasives	Develop and implement a plan to prevent the introduction of invasive non-native marine and coastal species into SNI waters which includes a standardized monitoring system focused on early detection for high priority aquatic invasive species, rapid response protocol, and promotes when an invasive is detected. Promote cooperative interagency efforts to collect and analyze comprehensive monitoring data.	1
NBVC NR In House		Minimize the introduction of pest species to SNI. Develop a rodent control /removal plan and implement if introduced species are detected. Determine presence or absence of non-native rodents.	1
NBVC NR In House / Research Institutions		Set up a central clearinghouse for data, reports, and publications pertaining to the NBVC's EMS that addresses natural resources and that is accessible to staff.	1
NBVC NR In House		Maintain habitats using principles of ecosystem management and sustainability and continue to use NEPA documentation. Define benefit or impact to the military mission.	1
O&MN	63126EPRClimateChange	Control and reduce greenhouse gas emissions by improving governance, implementing the SNI Net Zero Energy Installation Plan, providing energy conservation education, and addressing impacts in NEPA documents.	1
NBVC NR In House / Project Proponent		Promote training in sustainable design criteria for Navy staff and apply sustainability principles to the management of natural resources and the built environment by using metrics (indicators) of sustainability and by adopting LEED, LID, and Sustainable Sites Initiative approaches while continuing to use RSIP, master planning, site approval, and NEPA processes.	1
NBVC NR In House		Establish protocols for emergency and regular repair of infrastructure so that human life, health and safety are given precedence, but sensitive resources are also protected. Consider fish and wildlife conservation in all site feasibility studies and during project planning, design and construction.	1
NBVC NR In House / Project Proponent		Ensure siting criteria are addressed through the Project Review Board (NBVCINST 11010.1). Any proposed towers will also comply with USFWS guidelines for reducing fatal bird strikes to the greatest extent practicable.	1
NBVC NR In House		Participate in conservation, ecosystem, invasive species, and feral animal control planning in collaboration with other government agencies.	1
NBVC NR In House		Seek out and encourage partners to support independent scientific research and to develop cooperative research agreements focused on examining marine recruitment processes of important indicator species or species of concern.	1
NBVC NR In House		Remain an active participant with other agencies regarding San Nicolas Island fox and San Nicolas Island deer mouse issues.	1
NBVC NR In House		Support the integration of SNI into the Invasive Species Task Force on Santa Cruz Island and other Channel Islands as opportunities arise.	1
NBVC NR In House		Promote cooperative interagency efforts to collect and analyze comprehensive aquatic invasive species monitoring data, including shared funding and staff.	1
NBVC NR In House		Consult with USFWS and CDFG at least annually to fulfill SAIA provisions and related inter-agency cooperative agreements.	1
NBVC NR In House		Consider the use of Cooperative Agreements to get work done, especially research. A long-term advisory relationship and cooperative research relationship could continue with local universities.	1
NBVC NR In House		Establish and implement clear, coherent policies regarding public access to SNI including the near shore environment. Take active measures to discourage trespass and minimize the impacts of unauthorized access.	1
NBVC NR In House		Identify natural resource themes for public outreach. Participate in Earth Day and annual science festivals that occur in adjacent communities on the mainland.	1
NBVC NR In House		Ensure consistency with Coastal Zone Plans.	1
NBVC NR In House		Continue to participate in the Project Review Board and the Site Approval and Project Review Process and coordinate with the Cultural Resources program.	1
NBVC NR In House		Continue to use NEPA planning processes and documentation to guide specific projects and document choices and enforce mitigation measures proposed in those NEPA documents.	1

Table C-9. SNI INRMP List of Natural Resource Management Projects - 2019 (Continued).

Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level
NBVC NR In House		Collect and distribute data on sediment contamination to minimize risks to recreational and commercial water contact users, recreational and commercial fisheries, and to wildlife species.	1
NBVC NR In House		Support research to improve the adequacy of cumulative effects analysis, standardize the format in documents, and develop and implement compensation for cumulative effects.	1
NBVC NR In House		Conserve existing habitat values by promoting experimentation and application of alternative shoreline and underwater habitat structures. Encourage refitting of developed shorelines and existing structures to enhance habitat values.	1
NBVC NR In House		Promote experimentation and application of alternative LID and habitat-friendly landscaped areas adjacent to the shore.	1
NBVC NR In House		Implement this INRMP by applying it as an initial screen for review of projects proposed on the installation from both Navy and outside interests to improve the success of mitigation and enhancement projects based on regulatory, functional, and ecosystem criteria.	1
NBVC NR In House		Enforce Seasonal Avoidance Measures and Standard Mitigation Measures.	1
O&MN	63126EPREducation	Improve SNI community and environmental outreach through facilitating development of environmental education curriculum for researchers, personnel, and contractors. This will be accomplished by developing and distributing educational material, expanding education partnerships, by securing long-term funding to continue environmental education programs (e.g. brochures and videos), and evaluate the effectiveness of existing environmental education programs.	1
NBVC NR In House		Provide information and education for the enforcement of natural resource laws and regulations by professionally trained personnel such as federal and state Conservation Officers.	1
NBVC NR In House		Maintain staff knowledge through training and participation in natural resource research and conservation programs and share information with natural resource experts.	1
NBVC NR In House		Provide a notice of the intent to revise the INRMP to the USFWS and CDFG if a revision is found necessary.	1
NBVC NR In House		Comply with recent CNI draft guidance on INRMPs and continue to utilize the INRMP Metrics Builder to assess implementation.	1
NBVC NR In House		Provide funding and support for research and other studies to further SNI natural resources management.	1
NBVC NR In House		Provide documentation to secure appropriate levels of NBVC NR In House funding to support natural resource management programs.	1
NBVC NR In House		Develop prioritized lists of proposed management efforts to guide development of funding proposals.	1
NBVC NR In House		Develop plans and documentation to secure external funding and continue to request external funding from other state and federal agencies.	1
NBVC NR In House		Support scientific, academic, and volunteer efforts to initiate or supplement natural resources management programs.	1
NBVC NR In House		Identify and ensure departments prioritize and allocate funding to support compliance requirements.	1
NBVC NR In House		Seek awards for natural resource work conducted at SNI.	1
NBVC NR In House		Continue to ensure effective communication, adaptive oversight, and policy leadership through the USDON Natural Resources Strategic Plan.	1

Table C-10. SNI INRMP List of Natural Resource Management Projects - 2020 .

Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level
O&MN	69232B0094	Integrated Natural Resources Management Plan revisions and associated Environmental Assessment to incorporate current resources and management knowledge.	1
NBVC NR In House		Apply sustainability principles to the management of habitats, species, and ecological functions on SNI by identifying resource-specific best practices similar to Sustainable Sites Initiatives (SSI) approaches.	1
NBVC Other Navy In House		Update as needed and implement Storm Water Pollution Prevention Plan (SWPPP).	1
O&MN	63126EPRErosion	Develop and implement an erosion control plan.	1
O&MN	63126EPRFire	Develop and implement a Wildland Fire Management Plan (WFMP) for SNI.	1
O&MN	63126XXX89	Inventory plant species diversity, abundance, and density to develop priorities for monitoring that establishes ranking system, sensitive species habitat, and creates criteria for restoration work while define the extent, nature, and value of vegetation resources of SNI.	1
O&MN	63126EPRDune	Develop and implement a dune drift management plan to determine effective alternatives to manage dune drift impact to roads, operations, and natural resources.	1
O&MN	63126XXX87	Maintain a current inventory of wetlands to support planning and management efforts to achieve no net loss of wetlands.	1
NBVC NR In House		Protect the natural ecological integrity, structure, and functional values of the wetlands and floodplains on SNI.	1
O&MN	63126EPRMarine	Collect baseline information and establish monitoring protocols for sandy beach communities to support management to maintain habitat integrity.	1
O&MN	63126EPRMarine	Continue rocky intertidal surveys and encourage additional monitoring at SNI consistent with monitoring performed at the other Channel Islands and throughout California, to establish regional trends and understand site specific change.	1
O&MN	63126EPRMarine	Develop and implement unvegetated and vegetated soft bottom monitoring protocols at SNI to determine resource status and extent of submerged aquatic vegetation (eelgrass).	1
O&MN	63126EPRMarine	Support establishment of kelp forest ecosystem monitoring locations around SNI while encouraging state and federal agencies and academic researchers to investigate important community related questions involving recruitment, disturbance, and species diversity that help to assess regional trends.	1
NBVC NR In House		Develop management strategies through partnerships with the BLM to support the management of the Begg Rock State Marine Reserve and of the offshore rocks near SNI and Begg Rock that are designated as part of the CCNM.	1
O&MN	63126XXX85	Conduct regular monitoring of reptiles and amphibians in addition to island night lizard monitoring and develop accurate GIS data layers for known populations and conserve habitat associations to avoid sensitive areas and minimize potential impacts.	1
O&MN	63126EPRBird	Migratory and resident bird inventory and restoration management activities to conserve bird population and develop and maintain information on status and trend of population and habitats.	1
O&MN	63126XXX86	Monitor resident seabird populations and breeding colonies to track the sustainability of populations and their habitat.	1
NBVC NR In House		Implement bird conservation principles, measures, and practices through avoidance and minimization measures to protect resident and migratory bird populations.	1
O&MN	63126B0067	Inventory and monitor bat populations on SNI to adapt management strategies based on current population status.	1
O&MN	63126EPRMarine	Collect community level marine macroalgae baseline information surveys to support focused management efforts and identify indicator species. Survey subtidal and intertidal areas near high use locations (pier and barge landing areas) for the introduction of non-native invasive species.	1
O&MN	63126EPRMarine	Develop and implement a marine resource stewardship plan.	1
O&MN	63126XXX88	Monitor island-wide pinniped breeding and haul out sites and periodic evaluation of current adaptive management practices.	1
Navy Tenant Funded	63126B003	Ensure that land use plans and activities in or near threatened or endangered species habitats are accomplished in accordance with the ESA in accordance with current Biological Opinions and with ESA Section 7 Consultation Handbook (USFWS/NMFS March 1998).	1
O&MN	63126B003	Per USFWS Biological Opinion (2001) provide the USFWS an annual report containing the number of island night lizards, California brown pelicans, and western snowy plover killed or injured by Navy activities, and a summary of Navy activities and their effects on listed species in accordance with the Reporting Requirements in the BO (USFWS 2001).	1
O&MN	63126XXX85	Support recovery plan efforts to establish stable island night lizard populations and eventual delisting by conducting site specific surveys prior to disturbance activities, implementing avoidance and minimization measures, and conducting studies to investigate the effectiveness of island night lizard management strategies with respect to impacts from alligator lizards and the relocation island night lizards.	1
Navy Tenant Funded	63126B003	Support recovery plan efforts to establish stable western snowy plover populations and eventual delisting by closing nesting areas to recreational activity during the March 1 - September 15 breeding season and by removing unnecessary structures in nesting areas.	1

Table C-10. SNI INRMP List of Natural Resource Management Projects - 2020 (Continued).

Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level
Navy Tenant Funded	63126B003	Support recovery plan efforts to establish stable western snowy plover populations and eventual delisting by monitoring the effects of Navy activities on snowy plovers through conducting island-wide snowy plover censuses twice annually, once during the breeding season and once during the winter season, and through monitoring snowy plover nests during missile or target launches, general operations, and other activities that may disturb nesting behaviors.	1
O&MN	63126EPRBlackAb	Support recovery plan efforts to establish stable black abalone populations through continuing to conduct presence and absence surveys and through developing and implementing annual abalone monitoring protocols.	1
O&MN	63126EPRBlackAb	Continue to support appropriate closures at SNI and continue to review all military activities to ensure that they are in compliance with ESA and to avoid or minimize impacts to black abalone.	1
O&MN	63126EPRMarine	Support recovery plan efforts to establish stable white abalone populations by facilitating efforts to identify white abalone habitat and determine densities of individuals around SNI.	1
NBVC NR In House / Research Institutions		Support ongoing and new research on distribution and ecology of the Guadalupe fur seal. Encourage academic institutions to collect resource data. Record all sightings of Guadalupe fur seals and develop a database to track numbers of individuals, time of year, and location.	1
NBVC NR In House		Provide for the recovery, enhancement, and protection of species warranting Navy stewardship, as a proactive strategy to prevent federal listings and continue to resolve baseline biological data gaps.	1
O&MN	63126EPRRare Plant	Collect data on the habitat and reproductive requirements for sensitive endemic plants species for conservation and management efforts.	1
O&MN	63126EPRBird	Provide for the recovery, enhancement, and protection of Xantus's murrelets, as a proactive strategy to prevent federal listings and continue to resolve baseline biological data gaps.	1
O&MN	63126EPRBird	Provide for the recovery, enhancement, and protection of ashy storm-petrels, as a proactive strategy to prevent federal listings and continue to resolve baseline biological data gaps.	1
Navy Tenant Funded	63126XXX93	Maintain a viable population of the San Nicolas Island fox by reducing negative, human-caused impacts and remaining an active participant with other agencies regarding island fox issues.	1
Research Institutions		Determine the status of deer mouse populations and conserve and protect deer mouse habitat.	1
O&MN	63126EPRMarine	Support ongoing and new research on distribution and ecology of the southern sea otter at SNI. Encourage academic institutions to facilitate resource data collection and record all sightings of southern sea otters at SNI and develop a database to track numbers of individuals, time of year, and location.	1
O&MN	69232XXX90	Update and implement the invasive non-native plant species management and eradication program to insure use of existing BMPs to reduce the introduction of invasive species, establish early detection and rapid response protocol, map and prioritize most problematic terrestrial invasive non-native species populations, and maintain consistency with long-term protection of native plant communities.	1
O&MN	6923224086	Develop and implement a biosecurity plan to ensure invasive terrestrial fauna and flora are not brought to SNI by providing prevention, early detection, rapid response, and education guidelines.	1
O&MN	6923224086	Assess and monitor the progress and success of the removal of feral cats to support the shorebird enhancement project.	1
O&MN	63126EPRMarine Invasives	Develop and implement a plan to prevent the introduction of invasive non-native marine and coastal species into SNI waters which includes a standardized monitoring system focused on early detection for high priority aquatic invasive species, rapid response protocol, and promotes when an invasive is detected. Promote cooperative interagency efforts to collect and analyze comprehensive monitoring data.	1
Naval Air Operations		Survey and monitor avian species utilizing airfield and document bird strikes and carcasses adjacent to airfield.	1
Naval Air Operations		Develop and implement a BASH Plan and conduct a Wildlife Hazard Assessment for SNI.	1
NBVC NR In House		Minimize the introduction of pest species to SNI. Develop a rodent control /removal plan and implement if introduced species are detected. Determine presence or absence of non-native rodents.	1
NBVC NR In House / Research Institutions		Set up a central clearinghouse for data, reports, and publications pertaining to the NBVC's EMS that addresses natural resources and that is accessible to staff.	1
NBVC NR In House		Maintain habitats using principles of ecosystem management and sustainability and continue to use NEPA documentation. Define benefit or impact to the military mission.	1
O&MN	63126EPRClimateChange	Control and reduce greenhouse gas emissions by improving governance, implementing the SNI Net Zero Energy Installation Plan, providing energy conservation education, and addressing impacts in NEPA documents.	1
NBVC NR In House / NBVC Other Navy In House / Project Proponent		Update and implement the SNI Net Zero Energy Installation Plan to reduce dependency on jet fuel and thereby reducing air and water quality impacts.	1

Table C-10. SNI INRMP List of Natural Resource Management Projects - 2020 (Continued).

Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level
NBVC NR In House / Project Proponent		Promote training in sustainable design criteria for Navy staff and apply sustainability principles to the management of natural resources and the built environment by using metrics (indicators) of sustainability and by adopting LEED, LID, and Sustainable Sites Initiative approaches while continuing to use RSIP, master planning, site approval, and NEPA processes.	1
NBVC NR In House		Develop and implement a SAP at an organizational level.	1
NBVC NR In House		Establish protocols for emergency and regular repair of infrastructure so that human life, health and safety are given precedence, but sensitive resources are also protected. Consider fish and wildlife conservation in all site feasibility studies and during project planning, design and construction.	1
O&MN	63126EPRRoad	Develop and implement an Island Road Long-term Maintenance Plan that updates and improves road maintenance best management practices, applies the principles of "Integrated Vegetation Management", and adopts mowing instructions to meet multiple objectives for roadside maintenance to alleviate harmful environmental impacts and enhance possible benefits. Adopt a Mowing Instruction that provides roadside fire safety and minimizes detrimental environmental effects. Comply with CWA Section 404 Permit and Section 401 State Water Quality Certification.	1
NBVC NR In House / Project Proponent		Ensure siting criteria are addressed through the Project Review Board (NBVCINST 11010.1). Any proposed towers will also comply with USFWS guidelines for reducing fatal bird strikes to the greatest extent practicable.	1
NBVC NR In House		Participate in conservation, ecosystem, invasive species, and feral animal control planning in collaboration with other government agencies.	1
NBVC NR In House		Seek out and encourage partners to support independent scientific research and to develop cooperative research agreements focused on examining marine recruitment processes of important indicator species or species of concern.	1
NBVC NR In House		Remain an active participant with other agencies regarding San Nicolas Island fox and San Nicolas Island deer mouse issues.	1
NBVC NR In House		Support the integration of SNI into the Invasive Species Task Force on Santa Cruz Island and other Channel Islands as opportunities arise.	1
NBVC NR In House		Promote cooperative interagency efforts to collect and analyze comprehensive aquatic invasive species monitoring data, including shared funding and staff.	1
NBVC NR In House		Consult with USFWS and CDFG at least annually to fulfill SAIA provisions and related inter-agency cooperative agreements.	1
NBVC NR In House		Consider the use of Cooperative Agreements to get work done, especially research. A long-term advisory relationship and cooperative research relationship could continue with local universities.	1
NBVC NR In House		Establish and implement clear, coherent policies regarding public access to SNI including the near shore environment. Take active measures to discourage trespass and minimize the impacts of unauthorized access.	1
NBVC NR In House		Identify natural resource themes for public outreach. Participate in Earth Day and annual science festivals that occur in adjacent communities on the mainland.	1
NBVC NR In House		Ensure consistency with Coastal Zone Plans.	1
NBVC NR In House		Continue to participate in the Project Review Board and the Site Approval and Project Review Process and coordinate with the Cultural Resources program.	1
NBVC NR In House		Continue to use NEPA planning processes and documentation to guide specific projects and document choices and enforce mitigation measures proposed in those NEPA documents.	1
NBVC NR In House		Revise and implement the Storm Water Pollution Prevention Plan and water quality protection efforts throughout the SNI watershed.	1
NBVC NR In House		Integrate the protection priorities of this INRMP into the Emergency Response Action Plan and the Integrated Contingency Plan for Oil and Hazardous Substance Spill Prevention and Response.	1
NBVC NR In House		Support research to improve the adequacy of cumulative effects analysis, standardize the format in documents, and develop and implement compensation for cumulative effects.	1
NBVC NR In House		Conserve existing habitat values by promoting experimentation and application of alternative shoreline and underwater habitat structures. Encourage refitting of developed shorelines and existing structures to enhance habitat values.	1
NBVC NR In House		Promote experimentation and application of alternative LID and habitat-friendly landscaped areas adjacent to the shore.	1
NBVC NR In House		Implement this INRMP by applying it as an initial screen for review of projects proposed on the installation from both Navy and outside interests to improve the success of mitigation and enhancement projects based on regulatory, functional, and ecosystem criteria.	1
NBVC NR In House		Enforce Seasonal Avoidance Measures and Standard Mitigation Measures.	1
O&MN	63126EPRLandscape	Develop, implement, and revise as needed a Landscaping and Grounds Maintenance Plan and Instruction that outlines an appropriate landscaping and grounds maintenance program (e.g., that considers environmental factors and that adopts an Integrated Pest Management approach) to dealing with pest problems.	1
NBVC NR In House		Develop, implement, and update as need an Outdoor Recreation Plan that identifies and evaluates suitable outdoor recreation opportunities for installation personnel in undeveloped areas and that continues to limit public access and outdoor recreation that are not consistent with the military mission at SNI.	1

Table C-10. SNI INRMP List of Natural Resource Management Projects - 2020 (Continued).

Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level
O&MN	63126EPREducation	Improve SNI community and environmental outreach through facilitating development of environmental education curriculum for researchers, personnel, and contractors. This will be accomplished by developing and distributing educational material, expanding education partnerships, by securing long-term funding to continue environmental education programs (e.g. brochures and videos), and evaluate the effectiveness of existing environmental education programs.	1
NBVC NR In House		Provide information and education for the enforcement of natural resource laws and regulations by professionally trained personnel such as federal and state Conservation Officers.	1
NBVC NR In House		Maintain staff knowledge through training and participation in natural resource research and conservation programs and share information with natural resource experts.	1
NBVC NR In House		Provide a notice of the intent to revise the INRMP to the USFWS and CDFG if a revision is found necessary.	1
NBVC NR In House		Comply with recent CNI draft guidance on INRMPs and continue to utilize the INRMP Metrics Builder to assess implementation.	1
NBVC NR In House		Provide funding and support for research and other studies to further SNI natural resources management.	1
NBVC NR In House		Provide documentation to secure appropriate levels of NBVC NR In House funding to support natural resource management programs.	1
NBVC NR In House		Develop prioritized lists of proposed management efforts to guide development of funding proposals.	1
NBVC NR In House		Develop plans and documentation to secure external funding and continue to request external funding from other state and federal agencies.	1
NBVC NR In House		Support scientific, academic, and volunteer efforts to initiate or supplement natural resources management programs.	1
NBVC NR In House		Identify and ensure departments prioritize and allocate funding to support compliance requirements.	1
NBVC NR In House		Seek awards for natural resource work conducted at SNI.	1
NBVC NR In House		Continue to ensure effective communication, adaptive oversight, and policy leadership through the USDON Natural Resources Strategic Plan.	1

Table C-11. SNI INRMP List of Natural Resource Management Projects - 2021 .

Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level
O&MN	69232B0094	Integrated Natural Resources Management Plan revisions and associated Environmental Assessment to incorporate current resources and management knowledge.	1
NBVC NR In House		Apply sustainability principles to the management of habitats, species, and ecological functions on SNI by identifying resource-specific best practices similar to Sustainable Sites Initiatives (SSI) approaches.	1
NBVC NR In House		Protect the natural ecological integrity, structure, and functional values of the wetlands and floodplains on SNI.	1
O&MN	63126XXX85	Conduct regular monitoring of reptiles and amphibians in addition to island night lizard monitoring and develop accurate GIS data layers for known populations and conserve habitat associations to avoid sensitive areas and minimize potential impacts.	1
O&MN	63126EPRBird	Migratory and resident bird inventory and restoration management activities to conserve bird population and develop and maintain information on status and trend of population and habitats.	1
O&MN	63126XXX86	Monitor resident seabird populations and breeding colonies to track the sustainability of populations and their habitat.	1
NBVC NR In House		Implement bird conservation principles, measures, and practices through avoidance and minimization measures to protect resident and migratory bird populations.	1
O&MN	63126B0067	Inventory and monitor bat populations on SNI to adapt management strategies based on current population status.	1
O&MN	63126XXX88	Monitor island-wide pinniped breeding and haul out sites and periodic evaluation of current adaptive management practices.	1
Navy Tenant Funded	63126B003	Ensure that land use plans and activities in or near threatened or endangered species habitats are accomplished in accordance with the ESA in accordance with current Biological Opinions and with ESA Section 7 Consultation Handbook (USFWS/NMFS March 1998).	1
O&MN	63126B003	Per USFWS Biological Opinion (2001) provide the USFWS an annual report containing the number of island night lizards, California brown pelicans, and western snowy plover killed or injured by Navy activities, and a summary of Navy activities and their effects on listed species in accordance with the Reporting Requirements in the BO (USFWS 2001).	1
O&MN	63126XXX85	Support recovery plan efforts to establish stable island night lizard populations and eventual delisting by conducting site specific surveys prior to disturbance activities, implementing avoidance and minimization measures, and conducting studies to investigate the effectiveness of island night lizard management strategies with respect to impacts from alligator lizards and the relocation island night lizards.	1
Navy Tenant Funded	63126B003	Support recovery plan efforts to establish stable western snowy plover populations and eventual delisting by closing nesting areas to recreational activity during the March 1 - September 15 breeding season and by removing unnecessary structures in nesting areas.	1
Navy Tenant Funded	63126B003	Support recovery plan efforts to establish stable western snowy plover populations and eventual delisting by monitoring the effects of Navy activities on snowy plovers through conducting island-wide snowy plover censuses twice annually, once during the breeding season and once during the winter season, and through monitoring snowy plover nests during missile or target launches, general operations, and other activities that may disturb nesting behaviors.	1
O&MN	63126EPRBlackAb	Support recovery plan efforts to establish stable black abalone populations through continuing to conduct presence and absence surveys and through developing and implementing annual abalone monitoring protocols.	1
O&MN	63126EPRBlackAb	Continue to support appropriate closures at SNI and continue to review all military activities to ensure that they are in compliance with ESA and to avoid or minimize impacts to black abalone.	1
O&MN	63126EPRMarine	Support recovery plan efforts to establish stable white abalone populations by facilitating efforts to identify white abalone habitat and determine densities of individuals around SNI.	1
NBVC NR In House / Research Institutions		Support ongoing and new research on distribution and ecology of the Guadalupe fur seal. Encourage academic institutions to collect resource data. Record all sightings of Guadalupe fur seals and develop a database to track numbers of individuals, time of year, and location.	1
NBVC NR In House		Provide for the recovery, enhancement, and protection of species warranting Navy stewardship, as a proactive strategy to prevent federal listings and continue to resolve baseline biological data gaps.	1
O&MN	63126EPRBird	Provide for the recovery, enhancement, and protection of Xantus's murrelets, as a proactive strategy to prevent federal listings and continue to resolve baseline biological data gaps.	1
O&MN	63126EPRBird	Provide for the recovery, enhancement, and protection of ashy storm-petrels, as a proactive strategy to prevent federal listings and continue to resolve baseline biological data gaps.	1
Navy Tenant Funded	63126XXX93	Maintain a viable population of the San Nicolas Island fox by reducing negative, human-caused impacts and remaining an active participant with other agencies regarding island fox issues.	1
Research Institutions		Determine the status of deer mouse populations and conserve and protect deer mouse habitat.	1
O&MN	63126EPRMarine	Support ongoing and new research on distribution and ecology of the southern sea otter at SNI. Encourage academic institutions to facilitate resource data collection and record all sightings of southern sea otters at SNI and develop a database to track numbers of individuals, time of year, and location.	1

Table C-11. SNI INRMP List of Natural Resource Management Projects - 2021 (Continued).

Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level
O&MN	69232XXX90	Update and implement the invasive non-native plant species management and eradication program to insure use of existing BMPs to reduce the introduction of invasive species, establish early detection and rapid response protocol, map and prioritize most problematic terrestrial invasive non-native species populations, and maintain consistency with long-term protection of native plant communities.	1
O&MN	6923224086	Develop and implement a biosecurity plan to ensure invasive terrestrial fauna and flora are not brought to SNI by providing prevention, early detection, rapid response, and education guidelines.	1
O&MN	6923224086	Assess and monitor the progress and success of the removal of feral cats to support the shorebird enhancement project.	1
O&MN	63126EPRMarine Invasives	Develop and implement a plan to prevent the introduction of invasive non-native marine and coastal species into SNI waters which includes a standardized monitoring system focused on early detection for high priority aquatic invasive species, rapid response protocol, and promotes when an invasive is detected. Promote cooperative interagency efforts to collect and analyze comprehensive monitoring data.	1
NBVC NR In House		Minimize the introduction of pest species to SNI. Develop a rodent control /removal plan and implement if introduced species are detected. Determine presence or absence of non-native rodents.	1
NBVC NR In House / Research Institutions		Set up a central clearinghouse for data, reports, and publications pertaining to the NBVC's EMS that addresses natural resources and that is accessible to staff.	1
NBVC NR In House		Maintain habitats using principles of ecosystem management and sustainability and continue to use NEPA documentation. Define benefit or impact to the military mission.	1
O&MN	63126EPRClimateChange	Control and reduce greenhouse gas emissions by improving governance, implementing the SNI Net Zero Energy Installation Plan, providing energy conservation education, and addressing impacts in NEPA documents.	1
NBVC NR In House / Project Proponent		Promote training in sustainable design criteria for Navy staff and apply sustainability principles to the management of natural resources and the built environment by using metrics (indicators) of sustainability and by adopting LEED, LID, and Sustainable Sites Initiative approaches while continuing to use RSIP, master planning, site approval, and NEPA processes.	1
NBVC NR In House		Establish protocols for emergency and regular repair of infrastructure so that human life, health and safety are given precedence, but sensitive resources are also protected. Consider fish and wildlife conservation in all site feasibility studies and during project planning, design and construction.	1
NBVC NR In House / Project Proponent		Ensure siting criteria are addressed through the Project Review Board (NBVCINST 11010.1). Any proposed towers will also comply with USFWS guidelines for reducing fatal bird strikes to the greatest extent practicable.	1
NBVC NR In House		Participate in conservation, ecosystem, invasive species, and feral animal control planning in collaboration with other government agencies.	1
NBVC NR In House		Seek out and encourage partners to support independent scientific research and to develop cooperative research agreements focused on examining marine recruitment processes of important indicator species or species of concern.	1
NBVC NR In House		Remain an active participant with other agencies regarding San Nicolas Island fox and San Nicolas Island deer mouse issues.	1
NBVC NR In House		Support the integration of SNI into the Invasive Species Task Force on Santa Cruz Island and other Channel Islands as opportunities arise.	1
NBVC NR In House		Promote cooperative interagency efforts to collect and analyze comprehensive aquatic invasive species monitoring data, including shared funding and staff.	1
NBVC NR In House		Consult with USFWS and CDFG at least annually to fulfill SAIA provisions and related inter-agency cooperative agreements.	1
NBVC NR In House		Consider the use of Cooperative Agreements to get work done, especially research. A long-term advisory relationship and cooperative research relationship could continue with local universities.	1
NBVC NR In House		Establish and implement clear, coherent policies regarding public access to SNI including the near shore environment. Take active measures to discourage trespass and minimize the impacts of unauthorized access.	1
NBVC NR In House		Identify natural resource themes for public outreach. Participate in Earth Day and annual science festivals that occur in adjacent communities on the mainland.	1
NBVC NR In House		Ensure consistency with Coastal Zone Plans.	1
NBVC NR In House		Continue to participate in the Project Review Board and the Site Approval and Project Review Process and coordinate with the Cultural Resources program.	1
NBVC NR In House		Continue to use NEPA planning processes and documentation to guide specific projects and document choices and enforce mitigation measures proposed in those NEPA documents.	1
NBVC NR In House		Support research to improve the adequacy of cumulative effects analysis, standardize the format in documents, and develop and implement compensation for cumulative effects.	1
NBVC NR In House		Conserve existing habitat values by promoting experimentation and application of alternative shoreline and underwater habitat structures. Encourage refitting of developed shorelines and existing structures to enhance habitat values.	1
NBVC NR In House		Promote experimentation and application of alternative LID and habitat-friendly landscaped areas adjacent to the shore.	1
NBVC NR In House		Implement this INRMP by applying it as an initial screen for review of projects proposed on the installation from both Navy and outside interests to improve the success of mitigation and enhancement projects based on regulatory, functional, and ecosystem criteria.	1

Table C-11. SNI INRMP List of Natural Resource Management Projects - 2021 (Continued).

Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level
NBVC NR In House		Enforce Seasonal Avoidance Measures and Standard Mitigation Measures.	1
O&MN	63126EPREducation	Improve SNI community and environmental outreach through facilitating development of environmental education curriculum for researchers, personnel, and contractors. This will be accomplished by developing and distributing educational material, expanding education partnerships, by securing long-term funding to continue environmental education programs (e.g. brochures and videos), and evaluate the effectiveness of existing environmental education programs.	1
NBVC NR In House		Provide information and education for the enforcement of natural resource laws and regulations by professionally trained personnel such as federal and state Conservation Officers.	1
NBVC NR In House		Maintain staff knowledge through training and participation in natural resource research and conservation programs and share information with natural resource experts.	1
NBVC NR In House		Provide a notice of the intent to revise the INRMP to the USFWS and CDFG if a revision is found necessary.	1
NBVC NR In House		Comply with recent CNI draft guidance on INRMPs and continue to utilize the INRMP Metrics Builder to assess implementation.	1
NBVC NR In House		Provide funding and support for research and other studies to further SNI natural resources management.	1
NBVC NR In House		Provide documentation to secure appropriate levels of NBVC NR In House funding to support natural resource management programs.	1
NBVC NR In House		Develop prioritized lists of proposed management efforts to guide development of funding proposals.	1
NBVC NR In House		Develop plans and documentation to secure external funding and continue to request external funding from other state and federal agencies.	1
NBVC NR In House		Support scientific, academic, and volunteer efforts to initiate or supplement natural resources management programs.	1
NBVC NR In House		Identify and ensure departments prioritize and allocate funding to support compliance requirements.	1
NBVC NR In House		Seek awards for natural resource work conducted at SNI.	1
NBVC NR In House		Continue to ensure effective communication, adaptive oversight, and policy leadership through the USDON Natural Resources Strategic Plan.	1

Table C-12. SNI INRMP List of Natural Resource Management Projects - 2022 .

Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level
O&MN	69232B0094	Integrated Natural Resources Management Plan revisions and associated Environmental Assessment to incorporate current resources and management knowledge.	1
NBVC NR In House		Apply sustainability principles to the management of habitats, species, and ecological functions on SNI by identifying resource-specific best practices similar to Sustainable Sites Initiatives (SSI) approaches.	1
NBVC NR In House		Protect the natural ecological integrity, structure, and functional values of the wetlands and floodplains on SNI.	1
O&MN	63126EPRMarine	Collect baseline information and establish monitoring protocols for sandy beach communities to support management to maintain habitat integrity.	1
O&MN	63126EPRMarine	Continue rocky intertidal surveys and encourage additional monitoring at SNI consistent with monitoring performed at the other Channel Islands and throughout California, to establish regional trends and understand site specific change.	1
O&MN	63126EPRMarine	Develop and implement unvegetated and vegetated soft bottom monitoring protocols at SNI to determine resource status and extent of submerged aquatic vegetation (eelgrass).	1
O&MN	63126EPRMarine	Support establishment of kelp forest ecosystem monitoring locations around SNI while encouraging state and federal agencies and academic researchers to investigate important community related questions involving recruitment, disturbance, and species diversity that help to assess regional trends.	1
NBVC NR In House		Develop management strategies through partnerships with the BLM to support the management of the Begg Rock State Marine Reserve and of the offshore rocks near SNI and Begg Rock that are designated as part of the CCNM.	1
O&MN	63126XXX97	Collect baseline information on the invertebrate community of SNI, with particular emphasis on endemics and pollinators.	1
O&MN	63126XXX85	Conduct regular monitoring of reptiles and amphibians in addition to island night lizard monitoring and develop accurate GIS data layers for known populations and conserve habitat associations to avoid sensitive areas and minimize potential impacts.	1
O&MN	63126EPRBird	Migratory and resident bird inventory and restoration management activities to conserve bird population and develop and maintain information on status and trend of population and habitats.	1
O&MN	63126XXX86	Monitor resident seabird populations and breeding colonies to track the sustainability of populations and their habitat.	1
NBVC NR In House		Implement bird conservation principles, measures, and practices through avoidance and minimization measures to protect resident and migratory bird populations.	1
Research Institutions		Support small mammal monitoring programs at SNI to adapt management strategies based on current population status.	1
O&MN	63126B0067	Inventory and monitor bat populations on SNI to adapt management strategies based on current population status.	1
O&MN	63126EPRMarine	Collect community level marine macroalgae baseline information surveys to support focused management efforts and identify indicator species. Survey subtidal and intertidal areas near high use locations (pier and barge landing areas) for the introduction of non-native invasive species.	1
O&MN	63126EPRMarine	Develop a fish monitoring program and management plan to conserve fish population abundance and habitat diversity.	1
O&MN	63126XXX88	Monitor island-wide pinniped breeding and haul out sites and periodic evaluation of current adaptive management practices.	1
Navy Tenant Funded	63126B003	Ensure that land use plans and activities in or near threatened or endangered species habitats are accomplished in accordance with the ESA in accordance with current Biological Opinions and with ESA Section 7 Consultation Handbook (USFWS/NMFS March 1998).	1
O&MN	63126B003	Per USFWS Biological Opinion (2001) provide the USFWS an annual report containing the number of island night lizards, California brown pelicans, and western snowy plover killed or injured by Navy activities, and a summary of Navy activities and their effects on listed species in accordance with the Reporting Requirements in the BO (USFWS 2001).	1
O&MN	63126XXX85	Support recovery plan efforts to establish stable island night lizard populations and eventual delisting by conducting site specific surveys prior to disturbance activities, implementing avoidance and minimization measures, and conducting studies to investigate the effectiveness of island night lizard management strategies with respect to impacts from alligator lizards and the relocation island night lizards.	1
Navy Tenant Funded	63126B003	Support recovery plan efforts to establish stable western snowy plover populations and eventual delisting by closing nesting areas to recreational activity during the March 1 - September 15 breeding season and by removing unnecessary structures in nesting areas.	1
Navy Tenant Funded	63126B003	Support recovery plan efforts to establish stable western snowy plover populations and eventual delisting by monitoring the effects of Navy activities on snowy plovers through conducting island-wide snowy plover censuses twice annually, once during the breeding season and once during the winter season, and through monitoring snowy plover nests during missile or target launches, general operations, and other activities that may disturb nesting behaviors.	1
O&MN	63126EPRBlackAb	Support recovery plan efforts to establish stable black abalone populations through continuing to conduct presence and absence surveys and through developing and implementing annual abalone monitoring protocols.	1
O&MN	63126EPRBlackAb	Continue to support appropriate closures at SNI and continue to review all military activities to ensure that they are in compliance with ESA and to avoid or minimize impacts to black abalone.	1
O&MN	63126EPRMarine	Support recovery plan efforts to establish stable white abalone populations by facilitating efforts to identify white abalone habitat and determine densities of individuals around SNI.	1

Table C-12. SNI INRMP List of Natural Resource Management Projects - 2022 (Continued).

Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level
NBVC NR In House / Research Institutions		Support ongoing and new research on distribution and ecology of the Guadalupe fur seal. Encourage academic institutions to collect resource data. Record all sightings of Guadalupe fur seals and develop a database to track numbers of individuals, time of year, and location.	1
NBVC NR In House		Provide for the recovery, enhancement, and protection of species warranting Navy stewardship, as a proactive strategy to prevent federal listings and continue to resolve baseline biological data gaps.	1
O&MN	63126XXX97	Collect baseline information on the special status native invertebrate species of SNI.	1
O&MN	63126EPRBird	Provide for the recovery, enhancement, and protection of Xantus's murrelets, as a proactive strategy to prevent federal listings and continue to resolve baseline biological data gaps.	1
O&MN	63126EPRBird	Provide for the recovery, enhancement, and protection of ashy storm-petrels, as a proactive strategy to prevent federal listings and continue to resolve baseline biological data gaps.	1
Navy Tenant Funded	63126XXX93	Maintain a viable population of the San Nicolas Island fox by reducing negative, human-caused impacts and remaining an active participant with other agencies regarding island fox issues.	1
Research Institutions		Determine the status of deer mouse populations and conserve and protect deer mouse habitat.	1
O&MN	63126EPRMarine	Support ongoing and new research on distribution and ecology of the southern sea otter at SNI. Encourage academic institutions to facilitate resource data collection and record all sightings of southern sea otters at SNI and develop a database to track numbers of individuals, time of year, and location.	1
O&MN	69232XXX90	Update and implement the invasive non-native plant species management and eradication program to insure use of existing BMPs to reduce the introduction of invasive species, establish early detection and rapid response protocol, map and prioritize most problematic terrestrial invasive non-native species populations, and maintain consistency with long-term protection of native plant communities.	1
O&MN	6923224086	Develop and implement a biosecurity plan to ensure invasive terrestrial fauna and flora are not brought to SNI by providing prevention, early detection, rapid response, and education guidelines.	1
O&MN	6923224086	Assess and monitor the progress and success of the removal of feral cats to support the shorebird enhancement project.	1
O&MN	63126EPRMarine Invasives	Develop and implement a plan to prevent the introduction of invasive non-native marine and coastal species into SNI waters which includes a standardized monitoring system focused on early detection for high priority aquatic invasive species, rapid response protocol, and promotes when an invasive is detected. Promote cooperative interagency efforts to collect and analyze comprehensive monitoring data.	1
NBVC NR In House		Minimize the introduction of pest species to SNI. Develop a rodent control /removal plan and implement if introduced species are detected. Determine presence or absence of non-native rodents.	1
NBVC NR In House / Research Institutions		Set up a central clearinghouse for data, reports, and publications pertaining to the NBVC's EMS that addresses natural resources and that is accessible to staff.	1
NBVC NR In House		Maintain habitats using principles of ecosystem management and sustainability and continue to use NEPA documentation. Define benefit or impact to the military mission.	1
O&MN	63126EPRClimateChange	Control and reduce greenhouse gas emissions by improving governance, implementing the SNI Net Zero Energy Installation Plan, providing energy conservation education, and addressing impacts in NEPA documents.	1
NBVC NR In House / Project Proponent		Promote training in sustainable design criteria for Navy staff and apply sustainability principles to the management of natural resources and the built environment by using metrics (indicators) of sustainability and by adopting LEED, LID, and Sustainable Sites Initiative approaches while continuing to use RSIP, master planning, site approval, and NEPA processes.	1
NBVC NR In House		Establish protocols for emergency and regular repair of infrastructure so that human life, health and safety are given precedence, but sensitive resources are also protected. Consider fish and wildlife conservation in all site feasibility studies and during project planning, design and construction.	1
NBVC NR In House / Project Proponent		Ensure siting criteria are addressed through the Project Review Board (NBVCINST 11010.1). Any proposed towers will also comply with USFWS guidelines for reducing fatal bird strikes to the greatest extent practicable.	1
NBVC NR In House		Participate in conservation, ecosystem, invasive species, and feral animal control planning in collaboration with other government agencies.	1
NBVC NR In House		Seek out and encourage partners to support independent scientific research and to develop cooperative research agreements focused on examining marine recruitment processes of important indicator species or species of concern.	1
NBVC NR In House		Remain an active participant with other agencies regarding San Nicolas Island fox and San Nicolas Island deer mouse issues.	1
NBVC NR In House		Support the integration of SNI into the Invasive Species Task Force on Santa Cruz Island and other Channel Islands as opportunities arise.	1
NBVC NR In House		Promote cooperative interagency efforts to collect and analyze comprehensive aquatic invasive species monitoring data, including shared funding and staff.	1
NBVC NR In House		Consult with USFWS and CDFG at least annually to fulfill SAIA provisions and related inter-agency cooperative agreements.	1
NBVC NR In House		Consider the use of Cooperative Agreements to get work done, especially research. A long-term advisory relationship and cooperative research relationship could continue with local universities.	1

Table C-12. SNI INRMP List of Natural Resource Management Projects - 2022 (Continued).

Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level
NBVC NR In House		Establish and implement clear, coherent policies regarding public access to SNI including the near shore environment. Take active measures to discourage trespass and minimize the impacts of unauthorized access.	1
NBVC NR In House		Identify natural resource themes for public outreach. Participate in Earth Day and annual science festivals that occur in adjacent communities on the mainland.	1
NBVC NR In House		Ensure consistency with Coastal Zone Plans.	1
NBVC NR In House		Continue to participate in the Project Review Board and the Site Approval and Project Review Process and coordinate with the Cultural Resources program.	1
NBVC NR In House		Continue to use NEPA planning processes and documentation to guide specific projects and document choices and enforce mitigation measures proposed in those NEPA documents.	1
NBVC NR In House		Collect and distribute data on sediment contamination to minimize risks to recreational and commercial water contact users, recreational and commercial fisheries, and to wildlife species.	1
NBVC NR In House		Support research to improve the adequacy of cumulative effects analysis, standardize the format in documents, and develop and implement compensation for cumulative effects.	1
NBVC NR In House		Conserve existing habitat values by promoting experimentation and application of alternative shoreline and underwater habitat structures. Encourage refitting of developed shorelines and existing structures to enhance habitat values.	1
NBVC NR In House		Promote experimentation and application of alternative LID and habitat-friendly landscaped areas adjacent to the shore.	1
NBVC NR In House		Implement this INRMP by applying it as an initial screen for review of projects proposed on the installation from both Navy and outside interests to improve the success of mitigation and enhancement projects based on regulatory, functional, and ecosystem criteria.	1
NBVC NR In House		Enforce Seasonal Avoidance Measures and Standard Mitigation Measures.	1
O&MN	63126EPREducation	Improve SNI community and environmental outreach through facilitating development of environmental education curriculum for researchers, personnel, and contractors. This will be accomplished by developing and distributing educational material, expanding education partnerships, by securing long-term funding to continue environmental education programs (e.g. brochures and videos), and evaluate the effectiveness of existing environmental education programs.	1
NBVC NR In House		Provide information and education for the enforcement of natural resource laws and regulations by professionally trained personnel such as federal and state Conservation Officers.	1
NBVC NR In House		Maintain staff knowledge through training and participation in natural resource research and conservation programs and share information with natural resource experts.	1
NBVC NR In House		Provide a notice of the intent to revise the INRMP to the USFWS and CDFG if a revision is found necessary.	1
NBVC NR In House		Comply with recent CNI draft guidance on INRMPs and continue to utilize the INRMP Metrics Builder to assess implementation.	1
NBVC NR In House		Provide funding and support for research and other studies to further SNI natural resources management.	1
NBVC NR In House		Provide documentation to secure appropriate levels of NBVC NR In House funding to support natural resource management programs.	1
NBVC NR In House		Develop prioritized lists of proposed management efforts to guide development of funding proposals.	1
NBVC NR In House		Develop plans and documentation to secure external funding and continue to request external funding from other state and federal agencies.	1
NBVC NR In House		Support scientific, academic, and volunteer efforts to initiate or supplement natural resources management programs.	1
NBVC NR In House		Identify and ensure departments prioritize and allocate funding to support compliance requirements.	1
NBVC NR In House		Seek awards for natural resource work conducted at SNI.	1
NBVC NR In House		Continue to ensure effective communication, adaptive oversight, and policy leadership through the USDON Natural Resources Strategic Plan.	1

Table C-13. SNI INRMP List of Natural Resource Management Projects - 2023 .

Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level
O&MN	69232B0094	Integrated Natural Resources Management Plan revisions and associated Environmental Assessment to incorporate current resources and management knowledge.	1
NBVC NR In House		Apply sustainability principles to the management of habitats, species, and ecological functions on SNI by identifying resource-specific best practices similar to Sustainable Sites Initiatives (SSI) approaches.	1
NBVC NR In House		Protect the natural ecological integrity, structure, and functional values of the wetlands and floodplains on SNI.	1
O&MN	63126XXX85	Conduct regular monitoring of reptiles and amphibians in addition to island night lizard monitoring and develop accurate GIS data layers for known populations and conserve habitat associations to avoid sensitive areas and minimize potential impacts.	1
O&MN	63126EPRBird	Migratory and resident bird inventory and restoration management activities to conserve bird population and develop and maintain information on status and trend of population and habitats.	1
O&MN	63126XXX86	Monitor resident seabird populations and breeding colonies to track the sustainability of populations and their habitat.	1
NBVC NR In House		Implement bird conservation principles, measures, and practices through avoidance and minimization measures to protect resident and migratory bird populations.	1
O&MN	63126B0067	Inventory and monitor bat populations on SNI to adapt management strategies based on current population status.	1
O&MN	63126XXX88	Monitor island-wide pinniped breeding and haul out sites and periodic evaluation of current adaptive management practices.	1
Navy Tenant Funded	63126B003	Ensure that land use plans and activities in or near threatened or endangered species habitats are accomplished in accordance with the ESA in accordance with current Biological Opinions and with ESA Section 7 Consultation Handbook (USFWS/NMFS March 1998).	1
O&MN	63126B003	Per USFWS Biological Opinion (2001) provide the USFWS an annual report containing the number of island night lizards, California brown pelicans, and western snowy plover killed or injured by Navy activities, and a summary of Navy activities and their effects on listed species in accordance with the Reporting Requirements in the BO (USFWS 2001).	1
O&MN	63126XXX85	Support recovery plan efforts to establish stable island night lizard populations and eventual delisting by conducting site specific surveys prior to disturbance activities, implementing avoidance and minimization measures, and conducting studies to investigate the effectiveness of island night lizard management strategies with respect to impacts from alligator lizards and the relocation island night lizards.	1
Navy Tenant Funded	63126B003	Support recovery plan efforts to establish stable western snowy plover populations and eventual delisting by closing nesting areas to recreational activity during the March 1 - September 15 breeding season and by removing unnecessary structures in nesting areas.	1
Navy Tenant Funded	63126B003	Support recovery plan efforts to establish stable western snowy plover populations and eventual delisting by monitoring the effects of Navy activities on snowy plovers through conducting island-wide snowy plover censuses twice annually, once during the breeding season and once during the winter season, and through monitoring snowy plover nests during missile or target launches, general operations, and other activities that may disturb nesting behaviors.	1
O&MN	63126EPRBlackAb	Support recovery plan efforts to establish stable black abalone populations through continuing to conduct presence and absence surveys and through developing and implementing annual abalone monitoring protocols.	1
O&MN	63126EPRBlackAb	Continue to support appropriate closures at SNI and continue to review all military activities to ensure that they are in compliance with ESA and to avoid or minimize impacts to black abalone.	1
O&MN	63126EPRMarine	Support recovery plan efforts to establish stable white abalone populations by facilitating efforts to identify white abalone habitat and determine densities of individuals around SNI.	1
NBVC NR In House / Research Institutions		Support ongoing and new research on distribution and ecology of the Guadalupe fur seal. Encourage academic institutions to collect resource data. Record all sightings of Guadalupe fur seals and develop a database to track numbers of individuals, time of year, and location.	1
NBVC NR In House		Provide for the recovery, enhancement, and protection of species warranting Navy stewardship, as a proactive strategy to prevent federal listings and continue to resolve baseline biological data gaps.	1
O&MN	63126EPRBird	Provide for the recovery, enhancement, and protection of Xantus's murrelets, as a proactive strategy to prevent federal listings and continue to resolve baseline biological data gaps.	1
O&MN	63126EPRBird	Provide for the recovery, enhancement, and protection of ashy storm-petrels, as a proactive strategy to prevent federal listings and continue to resolve baseline biological data gaps.	1
Navy Tenant Funded	63126XXX93	Maintain a viable population of the San Nicolas Island fox by reducing negative, human-caused impacts and remaining an active participant with other agencies regarding island fox issues.	1
Research Institutions		Determine the status of deer mouse populations and conserve and protect deer mouse habitat.	1
O&MN	63126EPRMarine	Support ongoing and new research on distribution and ecology of the southern sea otter at SNI. Encourage academic institutions to facilitate resource data collection and record all sightings of southern sea otters at SNI and develop a database to track numbers of individuals, time of year, and location.	1

Table C-13. SNI INRMP List of Natural Resource Management Projects - 2023 (Continued).

Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level
O&MN	69232XXX90	Update and implement the invasive non-native plant species management and eradication program to insure use of existing BMPs to reduce the introduction of invasive species, establish early detection and rapid response protocol, map and prioritize most problematic terrestrial invasive non-native species populations, and maintain consistency with long-term protection of native plant communities.	1
O&MN	6923224086	Develop and implement a biosecurity plan to ensure invasive terrestrial fauna and flora are not brought to SNI by providing prevention, early detection, rapid response, and education guidelines.	1
O&MN	6923224086	Assess and monitor the progress and success of the removal of feral cats to support the shorebird enhancement project.	1
O&MN	63126EPRMarine Invasives	Develop and implement a plan to prevent the introduction of invasive non-native marine and coastal species into SNI waters which includes a standardized monitoring system focused on early detection for high priority aquatic invasive species, rapid response protocol, and promotes when an invasive is detected. Promote cooperative interagency efforts to collect and analyze comprehensive monitoring data.	1
NBVC NR In House		Minimize the introduction of pest species to SNI. Develop a rodent control /removal plan and implement if introduced species are detected. Determine presence or absence of non-native rodents.	1
NBVC NR In House / Research Institutions		Set up a central clearinghouse for data, reports, and publications pertaining to the NBVC's EMS that addresses natural resources and that is accessible to staff.	1
NBVC NR In House		Maintain habitats using principles of ecosystem management and sustainability and continue to use NEPA documentation. Define benefit or impact to the military mission.	1
O&MN	63126EPRClimateChange	Control and reduce greenhouse gas emissions by improving governance, implementing the SNI Net Zero Energy Installation Plan, providing energy conservation education, and addressing impacts in NEPA documents.	1
NBVC NR In House / Project Proponent		Promote training in sustainable design criteria for Navy staff and apply sustainability principles to the management of natural resources and the built environment by using metrics (indicators) of sustainability and by adopting LEED, LID, and Sustainable Sites Initiative approaches while continuing to use RSIP, master planning, site approval, and NEPA processes.	1
NBVC NR In House		Establish protocols for emergency and regular repair of infrastructure so that human life, health and safety are given precedence, but sensitive resources are also protected. Consider fish and wildlife conservation in all site feasibility studies and during project planning, design and construction.	1
NBVC NR In House / Project Proponent		Ensure siting criteria are addressed through the Project Review Board (NBVCINST 11010.1). Any proposed towers will also comply with USFWS guidelines for reducing fatal bird strikes to the greatest extent practicable.	1
NBVC NR In House		Participate in conservation, ecosystem, invasive species, and feral animal control planning in collaboration with other government agencies.	1
NBVC NR In House		Seek out and encourage partners to support independent scientific research and to develop cooperative research agreements focused on examining marine recruitment processes of important indicator species or species of concern.	1
NBVC NR In House		Remain an active participant with other agencies regarding San Nicolas Island fox and San Nicolas Island deer mouse issues.	1
NBVC NR In House		Support the integration of SNI into the Invasive Species Task Force on Santa Cruz Island and other Channel Islands as opportunities arise.	1
NBVC NR In House		Promote cooperative interagency efforts to collect and analyze comprehensive aquatic invasive species monitoring data, including shared funding and staff.	1
NBVC NR In House		Consult with USFWS and CDFG at least annually to fulfill SAIA provisions and related inter-agency cooperative agreements.	1
NBVC NR In House		Consider the use of Cooperative Agreements to get work done, especially research. A long-term advisory relationship and cooperative research relationship could continue with local universities.	1
NBVC NR In House		Establish and implement clear, coherent policies regarding public access to SNI including the near shore environment. Take active measures to discourage trespass and minimize the impacts of unauthorized access.	1
NBVC NR In House		Identify natural resource themes for public outreach. Participate in Earth Day and annual science festivals that occur in adjacent communities on the mainland.	1
NBVC NR In House		Ensure consistency with Coastal Zone Plans.	1
NBVC NR In House		Continue to participate in the Project Review Board and the Site Approval and Project Review Process and coordinate with the Cultural Resources program.	1
NBVC NR In House		Continue to use NEPA planning processes and documentation to guide specific projects and document choices and enforce mitigation measures proposed in those NEPA documents.	1
NBVC NR In House		Support research to improve the adequacy of cumulative effects analysis, standardize the format in documents, and develop and implement compensation for cumulative effects.	1
NBVC NR In House		Conserve existing habitat values by promoting experimentation and application of alternative shoreline and underwater habitat structures. Encourage refitting of developed shorelines and existing structures to enhance habitat values.	1
NBVC NR In House		Promote experimentation and application of alternative LID and habitat-friendly landscaped areas adjacent to the shore.	1

Table C-13. SNI INRMP List of Natural Resource Management Projects - 2023 (Continued).

Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level
NBVC NR In House		Implement this INRMP by applying it as an initial screen for review of projects proposed on the installation from both Navy and outside interests to improve the success of mitigation and enhancement projects based on regulatory, functional, and ecosystem criteria.	1
NBVC NR In House		Enforce Seasonal Avoidance Measures and Standard Mitigation Measures.	1
O&MN	63126EPREducation	Improve SNI community and environmental outreach through facilitating development of environmental education curriculum for researchers, personnel, and contractors. This will be accomplished by developing and distributing educational material, expanding education partnerships, by securing long-term funding to continue environmental education programs (e.g. brochures and videos), and evaluate the effectiveness of existing environmental education programs.	1
NBVC NR In House		Provide information and education for the enforcement of natural resource laws and regulations by professionally trained personnel such as federal and state Conservation Officers.	1
NBVC NR In House		Maintain staff knowledge through training and participation in natural resource research and conservation programs and share information with natural resource experts.	1
NBVC NR In House		Provide a notice of the intent to revise the INRMP to the USFWS and CDFG if a revision is found necessary.	1
NBVC NR In House		Comply with recent CNI draft guidance on INRMPs and continue to utilize the INRMP Metrics Builder to assess implementation.	1
NBVC NR In House		Provide funding and support for research and other studies to further SNI natural resources management.	1
NBVC NR In House		Provide documentation to secure appropriate levels of NBVC NR In House funding to support natural resource management programs.	1
NBVC NR In House		Develop prioritized lists of proposed management efforts to guide development of funding proposals.	1
NBVC NR In House		Develop plans and documentation to secure external funding and continue to request external funding from other state and federal agencies.	1
NBVC NR In House		Support scientific, academic, and volunteer efforts to initiate or supplement natural resources management programs.	1
NBVC NR In House		Identify and ensure departments prioritize and allocate funding to support compliance requirements.	1
NBVC NR In House		Seek awards for natural resource work conducted at SNI.	1
NBVC NR In House		Continue to ensure effective communication, adaptive oversight, and policy leadership through the USDON Natural Resources Strategic Plan.	1

Table C-14. SNI INRMP List of Natural Resource Management Projects - 2024 .

Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level
O&MN	69232B0094	Integrated Natural Resources Management Plan revisions and associated Environmental Assessment to incorporate current resources and management knowledge.	1
NBVC NR In House		Apply sustainability principles to the management of habitats, species, and ecological functions on SNI by identifying resource-specific best practices similar to Sustainable Sites Initiatives (SSI) approaches.	1
NBVC NR In House		Protect the natural ecological integrity, structure, and functional values of the wetlands and floodplains on SNI.	1
O&MN	63126EPRMarine	Collect baseline information and establish monitoring protocols for sandy beach communities to support management to maintain habitat integrity.	1
O&MN	63126EPRMarine	Continue rocky intertidal surveys and encourage additional monitoring at SNI consistent with monitoring performed at the other Channel Islands and throughout California, to establish regional trends and understand site specific change.	1
O&MN	63126EPRMarine	Develop and implement unvegetated and vegetated soft bottom monitoring protocols at SNI to determine resource status and extent of submerged aquatic vegetation (eelgrass).	1
O&MN	63126EPRMarine	Support establishment of kelp forest ecosystem monitoring locations around SNI while encouraging state and federal agencies and academic researchers to investigate important community related questions involving recruitment, disturbance, and species diversity that help to assess regional trends.	1
NBVC NR In House		Develop management strategies through partnerships with the BLM to support the management of the Begg Rock State Marine Reserve and of the offshore rocks near SNI and Begg Rock that are designated as part of the CCNM.	1
O&MN	63126XXX85	Conduct regular monitoring of reptiles and amphibians in addition to island night lizard monitoring and develop accurate GIS data layers for known populations and conserve habitat associations to avoid sensitive areas and minimize potential impacts.	1
O&MN	63126EPRBird	Migratory and resident bird inventory and restoration management activities to conserve bird population and develop and maintain information on status and trend of population and habitats.	1
O&MN	63126XXX86	Monitor resident seabird populations and breeding colonies to track the sustainability of populations and their habitat.	1
NBVC NR In House		Implement bird conservation principles, measures, and practices through avoidance and minimization measures to protect resident and migratory bird populations.	1
O&MN	63126B0067	Inventory and monitor bat populations on SNI to adapt management strategies based on current population status.	1
O&MN	63126EPR Marine	Collect community level marine macroalgae baseline information surveys to support focused management efforts and identify indicator species. Survey subtidal and intertidal areas near high use locations (pier and barge landing areas) for the introduction of non-native invasive species.	1
O&MN	63126XXX88	Monitor island-wide pinniped breeding and haul out sites and periodic evaluation of current adaptive management practices.	1
Navy Tenant Funded	63126B003	Ensure that land use plans and activities in or near threatened or endangered species habitats are accomplished in accordance with the ESA in accordance with current Biological Opinions and with ESA Section 7 Consultation Handbook (USFWS/NMFS March 1998).	1
O&MN	63126B003	Per USFWS Biological Opinion (2001) provide the USFWS an annual report containing the number of island night lizards, California brown pelicans, and western snowy plover killed or injured by Navy activities, and a summary of Navy activities and their effects on listed species in accordance with the Reporting Requirements in the BO (USFWS 2001).	1
O&MN	63126XXX85	Support recovery plan efforts to establish stable island night lizard populations and eventual delisting by conducting site specific surveys prior to disturbance activities, implementing avoidance and minimization measures, and conducting studies to investigate the effectiveness of island night lizard management strategies with respect to impacts from alligator lizards and the relocation island night lizards.	1
Navy Tenant Funded	63126B003	Support recovery plan efforts to establish stable western snowy plover populations and eventual delisting by closing nesting areas to recreational activity during the March 1 - September 15 breeding season and by removing unnecessary structures in nesting areas.	1
Navy Tenant Funded	63126B003	Support recovery plan efforts to establish stable western snowy plover populations and eventual delisting by monitoring the effects of Navy activities on snowy plovers through conducting island-wide snowy plover censuses twice annually, once during the breeding season and once during the winter season, and through monitoring snowy plover nests during missile or target launches, general operations, and other activities that may disturb nesting behaviors.	1
O&MN	63126EPRBlackAb	Support recovery plan efforts to establish stable black abalone populations through continuing to conduct presence and absence surveys and through developing and implementing annual abalone monitoring protocols.	1
O&MN	63126EPRBlackAb	Continue to support appropriate closures at SNI and continue to review all military activities to ensure that they are in compliance with ESA and to avoid or minimize impacts to black abalone.	1
O&MN	63126EPRMarine	Support recovery plan efforts to establish stable white abalone populations by facilitating efforts to identify white abalone habitat and determine densities of individuals around SNI.	1
NBVC NR In House / Research Institutions		Support ongoing and new research on distribution and ecology of the Guadalupe fur seal. Encourage academic institutions to collect resource data. Record all sightings of Guadalupe fur seals and develop a database to track numbers of individuals, time of year, and location.	1

Table C-14. SNI INRMP List of Natural Resource Management Projects - 2024 (Continued).

Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level
NBVC NR In House		Provide for the recovery, enhancement, and protection of species warranting Navy stewardship, as a proactive strategy to prevent federal listings and continue to resolve baseline biological data gaps.	1
O&MN	63126EPRBird	Provide for the recovery, enhancement, and protection of Xantus's murrelets, as a proactive strategy to prevent federal listings and continue to resolve baseline biological data gaps.	1
O&MN	63126EPRBird	Provide for the recovery, enhancement, and protection of ashy storm-petrels, as a proactive strategy to prevent federal listings and continue to resolve baseline biological data gaps.	1
Navy Tenant Funded	63126XXX93	Maintain a viable population of the San Nicolas Island fox by reducing negative, human-caused impacts and remaining an active participant with other agencies regarding island fox issues.	1
Research Institutions		Determine the status of deer mouse populations and conserve and protect deer mouse habitat.	1
O&MN	63126EPRMarine	Support ongoing and new research on distribution and ecology of the southern sea otter at SNI. Encourage academic institutions to facilitate resource data collection and record all sightings of southern sea otters at SNI and develop a database to track numbers of individuals, time of year, and location.	1
O&MN	69232XXX90	Update and implement the invasive non-native plant species management and eradication program to insure use of existing BMPs to reduce the introduction of invasive species, establish early detection and rapid response protocol, map and prioritize most problematic terrestrial invasive non-native species populations, and maintain consistency with long-term protection of native plant communities.	1
O&MN	6923224086	Develop and implement a biosecurity plan to ensure invasive terrestrial fauna and flora are not brought to SNI by providing prevention, early detection, rapid response, and education guidelines.	1
O&MN	6923224086	Assess and monitor the progress and success of the removal of feral cats to support the shorebird enhancement project.	1
O&MN	63126EPRMarine Invasives	Develop and implement a plan to prevent the introduction of invasive non-native marine and coastal species into SNI waters which includes a standardized monitoring system focused on early detection for high priority aquatic invasive species, rapid response protocol, and promotes when an invasive is detected. Promote cooperative interagency efforts to collect and analyze comprehensive monitoring data.	1
NBVC NR In House		Minimize the introduction of pest species to SNI. Develop a rodent control /removal plan and implement if introduced species are detected. Determine presence or absence of non-native rodents.	1
NBVC NR In House / Research Institutions		Set up a central clearinghouse for data, reports, and publications pertaining to the NBVC's EMS that addresses natural resources and that is accessible to staff.	1
NBVC NR In House		Maintain habitats using principles of ecosystem management and sustainability and continue to use NEPA documentation. Define benefit or impact to the military mission.	1
O&MN	63126EPRClimateChange	Control and reduce greenhouse gas emissions by improving governance, implementing the SNI Net Zero Energy Installation Plan, providing energy conservation education, and addressing impacts in NEPA documents.	1
NBVC NR In House / Project Proponent		Promote training in sustainable design criteria for Navy staff and apply sustainability principles to the management of natural resources and the built environment by using metrics (indicators) of sustainability and by adopting LEED, LID, and Sustainable Sites Initiative approaches while continuing to use RSIP, master planning, site approval, and NEPA processes.	1
NBVC NR In House		Establish protocols for emergency and regular repair of infrastructure so that human life, health and safety are given precedence, but sensitive resources are also protected. Consider fish and wildlife conservation in all site feasibility studies and during project planning, design and construction.	1
NBVC NR In House / Project Proponent		Ensure siting criteria are addressed through the Project Review Board (NBVCINST 11010.1). Any proposed towers will also comply with USFWS guidelines for reducing fatal bird strikes to the greatest extent practicable.	1
NBVC NR In House		Participate in conservation, ecosystem, invasive species, and feral animal control planning in collaboration with other government agencies.	1
NBVC NR In House		Seek out and encourage partners to support independent scientific research and to develop cooperative research agreements focused on examining marine recruitment processes of important indicator species or species of concern.	1
NBVC NR In House		Remain an active participant with other agencies regarding San Nicolas Island fox and San Nicolas Island deer mouse issues.	1
NBVC NR In House		Support the integration of SNI into the Invasive Species Task Force on Santa Cruz Island and other Channel Islands as opportunities arise.	1
NBVC NR In House		Promote cooperative interagency efforts to collect and analyze comprehensive aquatic invasive species monitoring data, including shared funding and staff.	1
NBVC NR In House		Consult with USFWS and CDFG at least annually to fulfill SAIA provisions and related inter-agency cooperative agreements.	1
NBVC NR In House		Consider the use of Cooperative Agreements to get work done, especially research. A long-term advisory relationship and cooperative research relationship could continue with local universities.	1
NBVC NR In House		Establish and implement clear, coherent policies regarding public access to SNI including the near shore environment. Take active measures to discourage trespass and minimize the impacts of unauthorized access.	1

Table C-14. SNI INRMP List of Natural Resource Management Projects - 2024 (Continued).

Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level
NBVC NR In House		Identify natural resource themes for public outreach. Participate in Earth Day and annual science festivals that occur in adjacent communities on the mainland.	1
NBVC NR In House		Ensure consistency with Coastal Zone Plans.	1
NBVC NR In House		Continue to participate in the Project Review Board and the Site Approval and Project Review Process and coordinate with the Cultural Resources program.	1
NBVC NR In House		Continue to use NEPA planning processes and documentation to guide specific projects and document choices and enforce mitigation measures proposed in those NEPA documents.	1
NBVC NR In House		Support research to improve the adequacy of cumulative effects analysis, standardize the format in documents, and develop and implement compensation for cumulative effects.	1
NBVC NR In House		Conserve existing habitat values by promoting experimentation and application of alternative shoreline and underwater habitat structures. Encourage refitting of developed shorelines and existing structures to enhance habitat values.	1
NBVC NR In House		Promote experimentation and application of alternative LID and habitat-friendly landscaped areas adjacent to the shore.	1
NBVC NR In House		Implement this INRMP by applying it as an initial screen for review of projects proposed on the installation from both Navy and outside interests to improve the success of mitigation and enhancement projects based on regulatory, functional, and ecosystem criteria.	1
NBVC NR In House		Enforce Seasonal Avoidance Measures and Standard Mitigation Measures.	1
O&MN	63126EPREducation	Improve SNI community and environmental outreach through facilitating development of environmental education curriculum for researchers, personnel, and contractors. This will be accomplished by developing and distributing educational material, expanding education partnerships, by securing long-term funding to continue environmental education programs (e.g. brochures and videos), and evaluate the effectiveness of existing environmental education programs.	1
NBVC NR In House		Provide information and education for the enforcement of natural resource laws and regulations by professionally trained personnel such as federal and state Conservation Officers.	1
NBVC NR In House		Maintain staff knowledge through training and participation in natural resource research and conservation programs and share information with natural resource experts.	1
NBVC NR In House		Provide a notice of the intent to revise the INRMP to the USFWS and CDFG if a revision is found necessary.	1
NBVC NR In House		Comply with recent CNI draft guidance on INRMPs and continue to utilize the INRMP Metrics Builder to assess implementation.	1
NBVC NR In House		Provide funding and support for research and other studies to further SNI natural resources management.	1
NBVC NR In House		Provide documentation to secure appropriate levels of NBVC NR In House funding to support natural resource management programs.	1
NBVC NR In House		Develop prioritized lists of proposed management efforts to guide development of funding proposals.	1
NBVC NR In House		Develop plans and documentation to secure external funding and continue to request external funding from other state and federal agencies.	1
NBVC NR In House		Support scientific, academic, and volunteer efforts to initiate or supplement natural resources management programs.	1
NBVC NR In House		Identify and ensure departments prioritize and allocate funding to support compliance requirements.	1
NBVC NR In House		Seek awards for natural resource work conducted at SNI.	1
NBVC NR In House		Continue to ensure effective communication, adaptive oversight, and policy leadership through the USDON Natural Resources Strategic Plan.	1

Table C-15. SNI INRMP List of Natural Resource Management Projects - 2025 .

Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level
O&MN	69232B0094	Integrated Natural Resources Management Plan revisions and associated Environmental Assessment to incorporate current resources and management knowledge.	1
NBVC NR In House		Apply sustainability principles to the management of habitats, species, and ecological functions on SNI by identifying resource-specific best practices similar to Sustainable Sites Initiatives (SSI) approaches.	1
NBVC Other Navy In House		Update as needed and implement Storm Water Pollution Prevention Plan (SWPPP).	1
O&MN	63126EPRErosion	Develop and implement an erosion control plan.	1
O&MN	63126EPRFire	Develop and implement a Wildland Fire Management Plan (WFMP) for SNI.	1
O&MN	63126XXX89	Inventory plant species diversity, abundance, and density to develop priorities for monitoring that establishes ranking system, sensitive species habitat, and creates criteria for restoration work while define the extent, nature, and value of vegetation resources of SNI.	1
O&MN	63126EPRDune	Develop and implement a dune drift management plan to determine effective alternatives to manage dune drift impact to roads, operations, and natural resources.	1
O&MN	63126XXX87	Maintain a current inventory of wetlands to support planning and management efforts to achieve no net loss of wetlands.	1
NBVC NR In House		Protect the natural ecological integrity, structure, and functional values of the wetlands and floodplains on SNI.	1
O&MN	63126XXX97	Collect baseline information on the invertebrate community of SNI, with particular emphasis on endemics and pollinators.	1
O&MN	63126XXX85	Conduct regular monitoring of reptiles and amphibians in addition to island night lizard monitoring and develop accurate GIS data layers for known populations and conserve habitat associations to avoid sensitive areas and minimize potential impacts.	1
O&MN	63126EPRBird	Migratory and resident bird inventory and restoration management activities to conserve bird population and develop and maintain information on status and trend of population and habitats.	1
O&MN	63126XXX86	Monitor resident seabird populations and breeding colonies to track the sustainability of populations and their habitat.	1
NBVC NR In House		Implement bird conservation principles, measures, and practices through avoidance and minimization measures to protect resident and migratory bird populations.	1
Research Institutions		Support small mammal monitoring programs at SNI to adapt management strategies based on current population status.	1
O&MN	63126B0067	Inventory and monitor bat populations on SNI to adapt management strategies based on current population status.	1
O&MN	63126EPRMarine	Develop and implement a marine resource stewardship plan.	1
O&MN	63126EPRMarine	Develop a fish monitoring program and management plan to conserve fish population abundance and habitat diversity.	1
O&MN	63126XXX88	Monitor island-wide pinniped breeding and haul out sites and periodic evaluation of current adaptive management practices.	1
Navy Tenant Funded	63126B003	Ensure that land use plans and activities in or near threatened or endangered species habitats are accomplished in accordance with the ESA in accordance with current Biological Opinions and with ESA Section 7 Consultation Handbook (USFWS/NMFS March 1998).	1
O&MN	63126B003	Per USFWS Biological Opinion (2001) provide the USFWS an annual report containing the number of island night lizards, California brown pelicans, and western snowy plover killed or injured by Navy activities, and a summary of Navy activities and their effects on listed species in accordance with the Reporting Requirements in the BO (USFWS 2001).	1
O&MN	63126XXX85	Support recovery plan efforts to establish stable island night lizard populations and eventual delisting by conducting site specific surveys prior to disturbance activities, implementing avoidance and minimization measures, and conducting studies to investigate the effectiveness of island night lizard management strategies with respect to impacts from alligator lizards and the relocation island night lizards.	1
Navy Tenant Funded	63126B003	Support recovery plan efforts to establish stable western snowy plover populations and eventual delisting by closing nesting areas to recreational activity during the March 1 - September 15 breeding season and by removing unnecessary structures in nesting areas.	1
Navy Tenant Funded	63126B003	Support recovery plan efforts to establish stable western snowy plover populations and eventual delisting by monitoring the effects of Navy activities on snowy plovers through conducting island-wide snowy plover censuses twice annually, once during the breeding season and once during the winter season, and through monitoring snowy plover nests during missile or target launches, general operations, and other activities that may disturb nesting behaviors.	1
O&MN	63126EPRBlackAb	Support recovery plan efforts to establish stable black abalone populations through continuing to conduct presence and absence surveys and through developing and implementing annual abalone monitoring protocols.	1
O&MN	63126EPRBlackAb	Continue to support appropriate closures at SNI and continue to review all military activities to ensure that they are in compliance with ESA and to avoid or minimize impacts to black abalone.	1
O&MN	63126EPRMarine	Support recovery plan efforts to establish stable white abalone populations by facilitating efforts to identify white abalone habitat and determine densities of individuals around SNI.	1

Table C-15. SNI INRMP List of Natural Resource Management Projects - 2025 (Continued).

Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level
NBVC NR In House / Research Institutions		Support ongoing and new research on distribution and ecology of the Guadalupe fur seal. Encourage academic institutions to collect resource data. Record all sightings of Guadalupe fur seals and develop a database to track numbers of individuals, time of year, and location.	1
NBVC NR In House		Provide for the recovery, enhancement, and protection of species warranting Navy stewardship, as a proactive strategy to prevent federal listings and continue to resolve baseline biological data gaps.	1
O&MN	63126EPRRare Plant	Collect data on the habitat and reproductive requirements for sensitive endemic plants species for conservation and management efforts.	1
O&MN	63126XXX97	Collect baseline information on the special status native invertebrate species of SNI.	1
O&MN	63126EPRBird	Provide for the recovery, enhancement, and protection of Xantus's murrelets, as a proactive strategy to prevent federal listings and continue to resolve baseline biological data gaps.	1
O&MN	63126EPRBird	Provide for the recovery, enhancement, and protection of ashy storm-petrels, as a proactive strategy to prevent federal listings and continue to resolve baseline biological data gaps.	1
Navy Tenant Funded	63126XXX93	Maintain a viable population of the San Nicolas Island fox by reducing negative, human-caused impacts and remaining an active participant with other agencies regarding island fox issues.	1
Research Institutions		Determine the status of deer mouse populations and conserve and protect deer mouse habitat.	1
O&MN	63126EPRMarine	Support ongoing and new research on distribution and ecology of the southern sea otter at SNI. Encourage academic institutions to facilitate resource data collection and record all sightings of southern sea otters at SNI and develop a database to track numbers of individuals, time of year, and location.	1
O&MN	69232XXX90	Update and implement the invasive non-native plant species management and eradication program to insure use of existing BMPs to reduce the introduction of invasive species, establish early detection and rapid response protocol, map and prioritize most problematic terrestrial invasive non-native species populations, and maintain consistency with long-term protection of native plant communities.	1
O&MN	6923224086	Develop and implement a biosecurity plan to ensure invasive terrestrial fauna and flora are not brought to SNI by providing prevention, early detection, rapid response, and education guidelines.	1
O&MN	6923224086	Assess and monitor the progress and success of the removal of feral cats to support the shorebird enhancement project.	1
O&MN	63126EPRMarineInvasives	Develop and implement a plan to prevent the introduction of invasive non-native marine and coastal species into SNI waters which includes a standardized monitoring system focused on early detection for high priority aquatic invasive species, rapid response protocol, and promotes when an invasive is detected. Promote cooperative interagency efforts to collect and analyze comprehensive monitoring data.	1
Naval Air Operations		Survey and monitor avian species utilizing airfield and document bird strikes and carcasses adjacent to airfield.	1
Naval Air Operations		Develop and implement a BASH Plan and conduct a Wildlife Hazard Assessment for SNI.	1
NBVC NR In House		Minimize the introduction of pest species to SNI. Develop a rodent control /removal plan and implement if introduced species are detected. Determine presence or absence of non-native rodents.	1
NBVC NR In House / Research Institutions		Set up a central clearinghouse for data, reports, and publications pertaining to the NBVC's EMS that addresses natural resources and that is accessible to staff.	1
NBVC NR In House		Maintain habitats using principles of ecosystem management and sustainability and continue to use NEPA documentation. Define benefit or impact to the military mission.	1
O&MN	63126EPRClimateChange	Control and reduce greenhouse gas emissions by improving governance, implementing the SNI Net Zero Energy Installation Plan, providing energy conservation education, and addressing impacts in NEPA documents.	1
NBVC NR In House / NBVC Other Navy In House / Project Proponent		Update and implement the SNI Net Zero Energy Installation Plan to reduce dependency on jet fuel and thereby reducing air and water quality impacts.	1
NBVC NR In House / Project Proponent		Promote training in sustainable design criteria for Navy staff and apply sustainability principles to the management of natural resources and the built environment by using metrics (indicators) of sustainability and by adopting LEED, LID, and Sustainable Sites Initiative approaches while continuing to use RSIP, master planning, site approval, and NEPA processes.	1
NBVC NR In House		Develop and implement a SAP at an organizational level.	1
NBVC NR In House		Establish protocols for emergency and regular repair of infrastructure so that human life, health and safety are given precedence, but sensitive resources are also protected. Consider fish and wildlife conservation in all site feasibility studies and during project planning, design and construction.	1
O&MN	63126EPRRoad	Develop and implement an Island Road Long-term Maintenance Plan that updates and improves road maintenance best management practices, applies the principles of "Integrated Vegetation Management", and adopts mowing instructions to meet multiple objectives for roadside maintenance to alleviate harmful environmental impacts and enhance possible benefits. Adopt a Mowing Instruction that provides roadside fire safety and minimizes detrimental environmental effects. Comply with CWA Section 404 Permit and Section 401 State Water Quality Certification.	1

Table C-15. SNI INRMP List of Natural Resource Management Projects - 2025 (Continued).

Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level
NBVC NR In House / Project Proponent		Ensure siting criteria are addressed through the Project Review Board (NBVCINST 11010.1). Any proposed towers will also comply with USFWS guidelines for reducing fatal bird strikes to the greatest extent practicable.	1
NBVC NR In House		Participate in conservation, ecosystem, invasive species, and feral animal control planning in collaboration with other government agencies.	1
NBVC NR In House		Seek out and encourage partners to support independent scientific research and to develop cooperative research agreements focused on examining marine recruitment processes of important indicator species or species of concern.	1
NBVC NR In House		Remain an active participant with other agencies regarding San Nicolas Island fox and San Nicolas Island deer mouse issues.	1
NBVC NR In House		Support the integration of SNI into the Invasive Species Task Force on Santa Cruz Island and other Channel Islands as opportunities arise.	1
NBVC NR In House		Promote cooperative interagency efforts to collect and analyze comprehensive aquatic invasive species monitoring data, including shared funding and staff.	1
NBVC NR In House		Consult with USFWS and CDFG at least annually to fulfill SAIA provisions and related inter-agency cooperative agreements.	1
NBVC NR In House		Consider the use of Cooperative Agreements to get work done, especially research. A long-term advisory relationship and cooperative research relationship could continue with local universities.	1
NBVC NR In House		Establish and implement clear, coherent policies regarding public access to SNI including the near shore environment. Take active measures to discourage trespass and minimize the impacts of unauthorized access.	1
NBVC NR In House		Identify natural resource themes for public outreach. Participate in Earth Day and annual science festivals that occur in adjacent communities on the mainland.	1
NBVC NR In House		Ensure consistency with Coastal Zone Plans.	1
NBVC NR In House		Continue to participate in the Project Review Board and the Site Approval and Project Review Process and coordinate with the Cultural Resources program.	1
NBVC NR In House		Continue to use NEPA planning processes and documentation to guide specific projects and document choices and enforce mitigation measures proposed in those NEPA documents.	1
NBVC NR In House		Revise and implement the Storm Water Pollution Prevention Plan and water quality protection efforts throughout the SNI watershed.	1
NBVC NR In House		Collect and distribute data on sediment contamination to minimize risks to recreational and commercial water contact users, recreational and commercial fisheries, and to wildlife species.	1
NBVC NR In House		Integrate the protection priorities of this INRMP into the Emergency Response Action Plan and the Integrated Contingency Plan for Oil and Hazardous Substance Spill Prevention and Response.	1
NBVC NR In House		Support research to improve the adequacy of cumulative effects analysis, standardize the format in documents, and develop and implement compensation for cumulative effects.	1
NBVC NR In House		Conserve existing habitat values by promoting experimentation and application of alternative shoreline and underwater habitat structures. Encourage refitting of developed shorelines and existing structures to enhance habitat values.	1
NBVC NR In House		Promote experimentation and application of alternative LID and habitat-friendly landscaped areas adjacent to the shore.	1
NBVC NR In House		Implement this INRMP by applying it as an initial screen for review of projects proposed on the installation from both Navy and outside interests to improve the success of mitigation and enhancement projects based on regulatory, functional, and ecosystem criteria.	1
NBVC NR In House		Enforce Seasonal Avoidance Measures and Standard Mitigation Measures.	1
O&MN	63126EPRLandscape	Develop, implement, and revise as needed a Landscaping and Grounds Maintenance Plan and Instruction that outlines an appropriate landscaping and grounds maintenance program (e.g. that considers environmental factors and that adopts an Integrated Pest Management approach) to dealing with pest problems.	1
NBVC NR In House		Develop, implement, and update as need an Outdoor Recreation Plan that identifies and evaluates suitable outdoor recreation opportunities for installation personnel in undeveloped areas and that continues to limit public access and outdoor recreation that are not consistent with the military mission at SNI.	1
O&MN	63126EPREducation	Improve SNI community and environmental outreach through facilitating development of environmental education curriculum for researchers, personnel, and contractors. This will be accomplished by developing and distributing educational material, expanding education partnerships, by securing long-term funding to continue environmental education programs (e.g. brochures and videos), and evaluate the effectiveness of existing environmental education programs.	1
NBVC NR In House		Provide information and education for the enforcement of natural resource laws and regulations by professionally trained personnel such as federal and state Conservation Officers.	1
NBVC NR In House		Maintain staff knowledge through training and participation in natural resource research and conservation programs and share information with natural resource experts.	1
NBVC NR In House		Provide a notice of the intent to revise the INRMP to the USFWS and CDFG if a revision is found necessary.	1
NBVC NR In House		Comply with recent CNI draft guidance on INRMPs and continue to utilize the INRMP Metrics Builder to assess implementation.	1

Table C-15. SNI INRMP List of Natural Resource Management Projects - 2025 (Continued).

Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level
NBVC NR In House		Provide funding and support for research and other studies to further SNI natural resources management.	1
NBVC NR In House		Provide documentation to secure appropriate levels of NBVC NR In House funding to support natural resource management programs.	1
NBVC NR In House		Develop prioritized lists of proposed management efforts to guide development of funding proposals.	1
NBVC NR In House		Develop plans and documentation to secure external funding and continue to request external funding from other state and federal agencies.	1
NBVC NR In House		Support scientific, academic, and volunteer efforts to initiate or supplement natural resources management programs.	1
NBVC NR In House		Identify and ensure departments prioritize and allocate funding to support compliance requirements.	1
NBVC NR In House		Seek awards for natural resource work conducted at SNI.	1
NBVC NR In House		Continue to ensure effective communication, adaptive oversight, and policy leadership through the USDON Natural Resources Strategic Plan.	1

Table C-16. SNI INRMP List of Natural Resource Management Projects - 2026 .

Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level
O&MN	69232B0094	Integrated Natural Resources Management Plan revisions and associated Environmental Assessment to incorporate current resources and management knowledge.	1
NBVC NR In House		Apply sustainability principles to the management of habitats, species, and ecological functions on SNI by identifying resource-specific best practices similar to Sustainable Sites Initiatives (SSI) approaches.	1
NBVC NR In House		Protect the natural ecological integrity, structure, and functional values of the wetlands and floodplains on SNI.	1
O&MN	63126EPRMarine	Collect baseline information and establish monitoring protocols for sandy beach communities to support management to maintain habitat integrity.	1
O&MN	63126EPRMarine	Continue rocky intertidal surveys and encourage additional monitoring at SNI consistent with monitoring performed at the other Channel Islands and throughout California, to establish regional trends and understand site specific change.	1
O&MN	63126EPRMarine	Develop and implement unvegetated and vegetated soft bottom monitoring protocols at SNI to determine resource status and extent of submerged aquatic vegetation (eelgrass).	1
O&MN	63126EPRMarine	Support establishment of kelp forest ecosystem monitoring locations around SNI while encouraging state and federal agencies and academic researchers to investigate important community related questions involving recruitment, disturbance, and species diversity that help to assess regional trends.	1
NBVC NR In House		Develop management strategies through partnerships with the BLM to support the management of the Begg Rock State Marine Reserve and of the offshore rocks near SNI and Begg Rock that are designated as part of the CCNM.	1
O&MN	63126XXX85	Conduct regular monitoring of reptiles and amphibians in addition to island night lizard monitoring and develop accurate GIS data layers for known populations and conserve habitat associations to avoid sensitive areas and minimize potential impacts.	1
O&MN	63126EPRBird	Migratory and resident bird inventory and restoration management activities to conserve bird population and develop and maintain information on status and trend of population and habitats.	1
O&MN	63126XXX86	Monitor resident seabird populations and breeding colonies to track the sustainability of populations and their habitat.	1
NBVC NR In House		Implement bird conservation principles, measures, and practices through avoidance and minimization measures to protect resident and migratory bird populations.	1
O&MN	63126B0067	Inventory and monitor bat populations on SNI to adapt management strategies based on current population status.	1
O&MN	63126EPRMarine	Collect community level marine macroalgae baseline information surveys to support focused management efforts and identify indicator species. Survey subtidal and intertidal areas near high use locations (pier and barge landing areas) for the introduction of non-native invasive species.	1
O&MN	63126XXX88	Monitor island-wide pinniped breeding and haul out sites and periodic evaluation of current adaptive management practices.	1
Navy Tenant Funded	63126B003	Ensure that land use plans and activities in or near threatened or endangered species habitats are accomplished in accordance with the ESA in accordance with current Biological Opinions and with ESA Section 7 Consultation Handbook (USFWS/NMFS March 1998).	1
O&MN	63126B003	Per USFWS Biological Opinion (2001) provide the USFWS an annual report containing the number of island night lizards, California brown pelicans, and western snowy plover killed or injured by Navy activities, and a summary of Navy activities and their effects on listed species in accordance with the Reporting Requirements in the BO (USFWS 2001).	1
O&MN	63126XXX85	Support recovery plan efforts to establish stable island night lizard populations and eventual delisting by conducting site specific surveys prior to disturbance activities, implementing avoidance and minimization measures, and conducting studies to investigate the effectiveness of island night lizard management strategies with respect to impacts from alligator lizards and the relocation island night lizards.	1
Navy Tenant Funded	63126B003	Support recovery plan efforts to establish stable western snowy plover populations and eventual delisting by closing nesting areas to recreational activity during the March 1 - September 15 breeding season and by removing unnecessary structures in nesting areas.	1
Navy Tenant Funded	63126B003	Support recovery plan efforts to establish stable western snowy plover populations and eventual delisting by monitoring the effects of Navy activities on snowy plovers through conducting island-wide snowy plover censuses twice annually, once during the breeding season and once during the winter season, and through monitoring snowy plover nests during missile or target launches, general operations, and other activities that may disturb nesting behaviors.	1
O&MN	63126EPRBlackAb	Support recovery plan efforts to establish stable black abalone populations through continuing to conduct presence and absence surveys and through developing and implementing annual abalone monitoring protocols.	1
O&MN	63126EPRBlackAb	Continue to support appropriate closures at SNI and continue to review all military activities to ensure that they are in compliance with ESA and to avoid or minimize impacts to black abalone.	1
O&MN	63126EPRMarine	Support recovery plan efforts to establish stable white abalone populations by facilitating efforts to identify white abalone habitat and determine densities of individuals around SNI.	1
NBVC NR In House / Research Institutions		Support ongoing and new research on distribution and ecology of the Guadalupe fur seal. Encourage academic institutions to collect resource data. Record all sightings of Guadalupe fur seals and develop a database to track numbers of individuals, time of year, and location.	1
NBVC NR In House		Provide for the recovery, enhancement, and protection of species warranting Navy stewardship, as a proactive strategy to prevent federal listings and continue to resolve baseline biological data gaps.	1

Table C-16. SNI INRMP List of Natural Resource Management Projects - 2026 (Continued).

Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level
O&MN	63126EPRBird	Provide for the recovery, enhancement, and protection of Xantus's murrelets, as a proactive strategy to prevent federal listings and continue to resolve baseline biological data gaps.	1
O&MN	63126EPRBird	Provide for the recovery, enhancement, and protection of ashy storm-petrels, as a proactive strategy to prevent federal listings and continue to resolve baseline biological data gaps.	1
Navy Tenant Funded	63126XXX93	Maintain a viable population of the San Nicolas Island fox by reducing negative, human-caused impacts and remaining an active participant with other agencies regarding island fox issues.	1
Research Institutions		Determine the status of deer mouse populations and conserve and protect deer mouse habitat.	1
O&MN	63126EPRMarine	Support ongoing and new research on distribution and ecology of the southern sea otter at SNI. Encourage academic institutions to facilitate resource data collection and record all sightings of southern sea otters at SNI and develop a database to track numbers of individuals, time of year, and location.	1
O&MN	69232XXX90	Update and implement the invasive non-native plant species management and eradication program to insure use of existing BMPs to reduce the introduction of invasive species, establish early detection and rapid response protocol, map and prioritize most problematic terrestrial invasive non-native species populations, and maintain consistency with long-term protection of native plant communities.	1
O&MN	6923224086	Develop and implement a biosecurity plan to ensure invasive terrestrial fauna and flora are not brought to SNI by providing prevention, early detection, rapid response, and education guidelines.	1
O&MN	6923224086	Assess and monitor the progress and success of the removal of feral cats to support the shorebird enhancement project.	1
O&MN	63126EPRMarineInvasives	Develop and implement a plan to prevent the introduction of invasive non-native marine and coastal species into SNI waters which includes a standardized monitoring system focused on early detection for high priority aquatic invasive species, rapid response protocol, and promotes when an invasive is detected. Promote cooperative interagency efforts to collect and analyze comprehensive monitoring data.	1
NBVC NR In House		Minimize the introduction of pest species to SNI. Develop a rodent control /removal plan and implement if introduced species are detected. Determine presence or absence of non-native rodents.	1
NBVC NR In House / Research Institutions		Set up a central clearinghouse for data, reports, and publications pertaining to the NBVC's EMS that addresses natural resources and that is accessible to staff.	1
NBVC NR In House		Maintain habitats using principles of ecosystem management and sustainability and continue to use NEPA documentation. Define benefit or impact to the military mission.	1
O&MN	63126EPRClimateChange	Control and reduce greenhouse gas emissions by improving governance, implementing the SNI Net Zero Energy Installation Plan, providing energy conservation education, and addressing impacts in NEPA documents.	1
NBVC NR In House / Project Proponent		Promote training in sustainable design criteria for Navy staff and apply sustainability principles to the management of natural resources and the built environment by using metrics (indicators) of sustainability and by adopting LEED, LID, and Sustainable Sites Initiative approaches while continuing to use RSIP, master planning, site approval, and NEPA processes.	1
NBVC NR In House		Establish protocols for emergency and regular repair of infrastructure so that human life, health and safety are given precedence, but sensitive resources are also protected. Consider fish and wildlife conservation in all site feasibility studies and during project planning, design and construction.	1
NBVC NR In House / Project Proponent		Ensure siting criteria are addressed through the Project Review Board (NBVCINST 11010.1). Any proposed towers will also comply with USFWS guidelines for reducing fatal bird strikes to the greatest extent practicable.	1
NBVC NR In House		Participate in conservation, ecosystem, invasive species, and feral animal control planning in collaboration with other government agencies.	1
NBVC NR In House		Seek out and encourage partners to support independent scientific research and to develop cooperative research agreements focused on examining marine recruitment processes of important indicator species or species of concern.	1
NBVC NR In House		Remain an active participant with other agencies regarding San Nicolas Island fox and San Nicolas Island deer mouse issues.	1
NBVC NR In House		Support the integration of SNI into the Invasive Species Task Force on Santa Cruz Island and other Channel Islands as opportunities arise.	1
NBVC NR In House		Promote cooperative interagency efforts to collect and analyze comprehensive aquatic invasive species monitoring data, including shared funding and staff.	1
NBVC NR In House		Consult with USFWS and CDFG at least annually to fulfill SAIA provisions and related inter-agency cooperative agreements.	1
NBVC NR In House		Consider the use of Cooperative Agreements to get work done, especially research. A long-term advisory relationship and cooperative research relationship could continue with local universities.	1
NBVC NR In House		Establish and implement clear, coherent policies regarding public access to SNI including the near shore environment. Take active measures to discourage trespass and minimize the impacts of unauthorized access.	1
NBVC NR In House		Identify natural resource themes for public outreach. Participate in Earth Day and annual science festivals that occur in adjacent communities on the mainland.	1
NBVC NR In House		Ensure consistency with Coastal Zone Plans.	1
NBVC NR In House		Continue to participate in the Project Review Board and the Site Approval and Project Review Process and coordinate with the Cultural Resources program.	1

Table C-16. SNI INRMP List of Natural Resource Management Projects - 2026 (Continued).

Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level
NBVC NR In House		Continue to use NEPA planning processes and documentation to guide specific projects and document choices and enforce mitigation measures proposed in those NEPA documents.	1
NBVC NR In House		Support research to improve the adequacy of cumulative effects analysis, standardize the format in documents, and develop and implement compensation for cumulative effects.	1
NBVC NR In House		Conserve existing habitat values by promoting experimentation and application of alternative shoreline and underwater habitat structures. Encourage refitting of developed shorelines and existing structures to enhance habitat values.	1
NBVC NR In House		Promote experimentation and application of alternative LID and habitat-friendly landscaped areas adjacent to the shore.	1
NBVC NR In House		Implement this INRMP by applying it as an initial screen for review of projects proposed on the installation from both Navy and outside interests to improve the success of mitigation and enhancement projects based on regulatory, functional, and ecosystem criteria.	1
NBVC NR In House		Enforce Seasonal Avoidance Measures and Standard Mitigation Measures.	1
O&MN	63126EPREducation	Improve SNI community and environmental outreach through facilitating development of environmental education curriculum for researchers, personnel, and contractors. This will be accomplished by developing and distributing educational material, expanding education partnerships, by securing long-term funding to continue environmental education programs (e.g. brochures and videos), and evaluate the effectiveness of existing environmental education programs.	1
NBVC NR In House		Provide information and education for the enforcement of natural resource laws and regulations by professionally trained personnel such as federal and state Conservation Officers.	1
NBVC NR In House		Maintain staff knowledge through training and participation in natural resource research and conservation programs and share information with natural resource experts.	1
NBVC NR In House		Provide a notice of the intent to revise the INRMP to the USFWS and CDFG if a revision is found necessary.	1
NBVC NR In House		Comply with recent CNI draft guidance on INRMPs and continue to utilize the INRMP Metrics Builder to assess implementation.	1
NBVC NR In House		Provide funding and support for research and other studies to further SNI natural resources management.	1
NBVC NR In House		Provide documentation to secure appropriate levels of NBVC NR In House funding to support natural resource management programs.	1
NBVC NR In House		Develop prioritized lists of proposed management efforts to guide development of funding proposals.	1
NBVC NR In House		Develop plans and documentation to secure external funding and continue to request external funding from other state and federal agencies.	1
NBVC NR In House		Support scientific, academic, and volunteer efforts to initiate or supplement natural resources management programs.	1
NBVC NR In House		Identify and ensure departments prioritize and allocate funding to support compliance requirements.	1
NBVC NR In House		Seek awards for natural resource work conducted at SNI.	1
NBVC NR In House		Continue to ensure effective communication, adaptive oversight, and policy leadership through the USDON Natural Resources Strategic Plan.	1

Table C-17. SNI INRMP List of Natural Resource Management Projects - 2027 .

Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level
O&MN	69232B0094	Integrated Natural Resources Management Plan revisions and associated Environmental Assessment to incorporate current resources and management knowledge.	1
NBVC NR In House		Apply sustainability principles to the management of habitats, species, and ecological functions on SNI by identifying resource-specific best practices similar to Sustainable Sites Initiatives (SSI) approaches.	1
NBVC NR In House		Protect the natural ecological integrity, structure, and functional values of the wetlands and floodplains on SNI.	1
O&MN	63126XXX85	Conduct regular monitoring of reptiles and amphibians in addition to island night lizard monitoring and develop accurate GIS data layers for known populations and conserve habitat associations to avoid sensitive areas and minimize potential impacts.	1
O&MN	63126EPRBird	Migratory and resident bird inventory and restoration management activities to conserve bird population and develop and maintain information on status and trend of population and habitats.	1
O&MN	63126XXX86	Monitor resident seabird populations and breeding colonies to track the sustainability of populations and their habitat.	1
NBVC NR In House		Implement bird conservation principles, measures, and practices through avoidance and minimization measures to protect resident and migratory bird populations.	1
O&MN	63126B0067	Inventory and monitor bat populations on SNI to adapt management strategies based on current population status.	1
O&MN	63126XXX88	Monitor island-wide pinniped breeding and haul out sites and periodic evaluation of current adaptive management practices.	1
Navy Tenant Funded	63126B003	Ensure that land use plans and activities in or near threatened or endangered species habitats are accomplished in accordance with the ESA in accordance with current Biological Opinions and with ESA Section 7 Consultation Handbook (USFWS/NMFS March 1998).	1
O&MN	63126B003	Per USFWS Biological Opinion (2001) provide the USFWS an annual report containing the number of island night lizards, California brown pelicans, and western snowy plover killed or injured by Navy activities, and a summary of Navy activities and their effects on listed species in accordance with the Reporting Requirements in the BO (USFWS 2001).	1
O&MN	63126XXX85	Support recovery plan efforts to establish stable island night lizard populations and eventual delisting by conducting site specific surveys prior to disturbance activities, implementing avoidance and minimization measures, and conducting studies to investigate the effectiveness of island night lizard management strategies with respect to impacts from alligator lizards and the relocation island night lizards.	1
Navy Tenant Funded	63126B003	Support recovery plan efforts to establish stable western snowy plover populations and eventual delisting by closing nesting areas to recreational activity during the March 1 - September 15 breeding season and by removing unnecessary structures in nesting areas.	1
Navy Tenant Funded	63126B003	Support recovery plan efforts to establish stable western snowy plover populations and eventual delisting by monitoring the effects of Navy activities on snowy plovers through conducting island-wide snowy plover censuses twice annually, once during the breeding season and once during the winter season, and through monitoring snowy plover nests during missile or target launches, general operations, and other activities that may disturb nesting behaviors.	1
O&MN	63126EPRBlackAb	Support recovery plan efforts to establish stable black abalone populations through continuing to conduct presence and absence surveys and through developing and implementing annual abalone monitoring protocols.	1
O&MN	63126EPRBlackAb	Continue to support appropriate closures at SNI and continue to review all military activities to ensure that they are in compliance with ESA and to avoid or minimize impacts to black abalone.	1
O&MN	63126EPRMarine	Support recovery plan efforts to establish stable white abalone populations by facilitating efforts to identify white abalone habitat and determine densities of individuals around SNI.	1
NBVC NR In House / Research Institutions		Support ongoing and new research on distribution and ecology of the Guadalupe fur seal. Encourage academic institutions to collect resource data. Record all sightings of Guadalupe fur seals and develop a database to track numbers of individuals, time of year, and location.	1
NBVC NR In House		Provide for the recovery, enhancement, and protection of species warranting Navy stewardship, as a proactive strategy to prevent federal listings and continue to resolve baseline biological data gaps.	1
O&MN	63126EPRBird	Provide for the recovery, enhancement, and protection of Xantus's murrelets, as a proactive strategy to prevent federal listings and continue to resolve baseline biological data gaps.	1
O&MN	63126EPRBird	Provide for the recovery, enhancement, and protection of ashy storm-petrels, as a proactive strategy to prevent federal listings and continue to resolve baseline biological data gaps.	1
Navy Tenant Funded	63126XXX93	Maintain a viable population of the San Nicolas Island fox by reducing negative, human-caused impacts and remaining an active participant with other agencies regarding island fox issues.	1
Research Institutions		Determine the status of deer mouse populations and conserve and protect deer mouse habitat.	1
O&MN	63126EPRMarine	Support ongoing and new research on distribution and ecology of the southern sea otter at SNI. Encourage academic institutions to facilitate resource data collection and record all sightings of southern sea otters at SNI and develop a database to track numbers of individuals, time of year, and location.	1

Table C-17. SNI INRMP List of Natural Resource Management Projects - 2027 (Continued).

Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level
O&MN	69232XXX90	Update and implement the invasive non-native plant species management and eradication program to insure use of existing BMPs to reduce the introduction of invasive species, establish early detection and rapid response protocol, map and prioritize most problematic terrestrial invasive non-native species populations, and maintain consistency with long-term protection of native plant communities.	1
O&MN	6923224086	Develop and implement a biosecurity plan to ensure invasive terrestrial fauna and flora are not brought to SNI by providing prevention, early detection, rapid response, and education guidelines.	1
O&MN	6923224086	Assess and monitor the progress and success of the removal of feral cats to support the shorebird enhancement project.	1
O&MN	63126EPRMarineInvasives	Develop and implement a plan to prevent the introduction of invasive non-native marine and coastal species into SNI waters which includes a standardized monitoring system focused on early detection for high priority aquatic invasive species, rapid response protocol, and promotes when an invasive is detected. Promote cooperative interagency efforts to collect and analyze comprehensive monitoring data.	1
NBVC NR In House		Minimize the introduction of pest species to SNI. Develop a rodent control /removal plan and implement if introduced species are detected. Determine presence or absence of non-native rodents.	1
NBVC NR In House / Research Institutions		Set up a central clearinghouse for data, reports, and publications pertaining to the NBVC's EMS that addresses natural resources and that is accessible to staff.	1
NBVC NR In House		Maintain habitats using principles of ecosystem management and sustainability and continue to use NEPA documentation. Define benefit or impact to the military mission.	1
O&MN	63126EPRClimateChange	Control and reduce greenhouse gas emissions by improving governance, implementing the SNI Net Zero Energy Installation Plan, providing energy conservation education, and addressing impacts in NEPA documents.	1
NBVC NR In House / Project Proponent		Promote training in sustainable design criteria for Navy staff and apply sustainability principles to the management of natural resources and the built environment by using metrics (indicators) of sustainability and by adopting LEED, LID, and Sustainable Sites Initiative approaches while continuing to use RSIP, master planning, site approval, and NEPA processes.	1
NBVC NR In House		Establish protocols for emergency and regular repair of infrastructure so that human life, health and safety are given precedence, but sensitive resources are also protected. Consider fish and wildlife conservation in all site feasibility studies and during project planning, design and construction.	1
NBVC NR In House / Project Proponent		Ensure siting criteria are addressed through the Project Review Board (NBVCINST 11010.1). Any proposed towers will also comply with USFWS guidelines for reducing fatal bird strikes to the greatest extent practicable.	1
NBVC NR In House		Participate in conservation, ecosystem, invasive species, and feral animal control planning in collaboration with other government agencies.	1
NBVC NR In House		Seek out and encourage partners to support independent scientific research and to develop cooperative research agreements focused on examining marine recruitment processes of important indicator species or species of concern.	1
NBVC NR In House		Remain an active participant with other agencies regarding San Nicolas Island fox and San Nicolas Island deer mouse issues.	1
NBVC NR In House		Support the integration of SNI into the Invasive Species Task Force on Santa Cruz Island and other Channel Islands as opportunities arise.	1
NBVC NR In House		Promote cooperative interagency efforts to collect and analyze comprehensive aquatic invasive species monitoring data, including shared funding and staff.	1
NBVC NR In House		Consult with USFWS and CDFG at least annually to fulfill SAIA provisions and related inter-agency cooperative agreements.	1
NBVC NR In House		Consider the use of Cooperative Agreements to get work done, especially research. A long-term advisory relationship and cooperative research relationship could continue with local universities.	1
NBVC NR In House		Establish and implement clear, coherent policies regarding public access to SNI including the near shore environment. Take active measures to discourage trespass and minimize the impacts of unauthorized access.	1
NBVC NR In House		Identify natural resource themes for public outreach. Participate in Earth Day and annual science festivals that occur in adjacent communities on the mainland.	1
NBVC NR In House		Ensure consistency with Coastal Zone Plans.	1
NBVC NR In House		Continue to participate in the Project Review Board and the Site Approval and Project Review Process and coordinate with the Cultural Resources program.	1
NBVC NR In House		Continue to use NEPA planning processes and documentation to guide specific projects and document choices and enforce mitigation measures proposed in those NEPA documents.	1
NBVC NR In House		Support research to improve the adequacy of cumulative effects analysis, standardize the format in documents, and develop and implement compensation for cumulative effects.	1
NBVC NR In House		Conserve existing habitat values by promoting experimentation and application of alternative shoreline and underwater habitat structures. Encourage refitting of developed shorelines and existing structures to enhance habitat values.	1
NBVC NR In House		Promote experimentation and application of alternative LID and habitat-friendly landscaped areas adjacent to the shore.	1
NBVC NR In House		Implement this INRMP by applying it as an initial screen for review of projects proposed on the installation from both Navy and outside interests to improve the success of mitigation and enhancement projects based on regulatory, functional, and ecosystem criteria.	1

Table C-17. SNI INRMP List of Natural Resource Management Projects - 2027 (Continued).

Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level
NBVC NR In House		Enforce Seasonal Avoidance Measures and Standard Mitigation Measures.	1
O&MN	63126EPREducation	Improve SNI community and environmental outreach through facilitating development of environmental education curriculum for researchers, personnel, and contractors. This will be accomplished by developing and distributing educational material, expanding education partnerships, by securing long-term funding to continue environmental education programs (e.g. brochures and videos), and evaluate the effectiveness of existing environmental education programs.	1
NBVC NR In House		Provide information and education for the enforcement of natural resource laws and regulations by professionally trained personnel such as federal and state Conservation Officers.	1
NBVC NR In House		Maintain staff knowledge through training and participation in natural resource research and conservation programs and share information with natural resource experts.	1
NBVC NR In House		Provide a notice of the intent to revise the INRMP to the USFWS and CDFG if a revision is found necessary.	1
NBVC NR In House		Comply with recent CNI draft guidance on INRMPs and continue to utilize the INRMP Metrics Builder to assess implementation.	1
NBVC NR In House		Provide funding and support for research and other studies to further SNI natural resources management.	1
NBVC NR In House		Provide documentation to secure appropriate levels of NBVC NR In House funding to support natural resource management programs.	1
NBVC NR In House		Develop prioritized lists of proposed management efforts to guide development of funding proposals.	1
NBVC NR In House		Develop plans and documentation to secure external funding and continue to request external funding from other state and federal agencies.	1
NBVC NR In House		Support scientific, academic, and volunteer efforts to initiate or supplement natural resources management programs.	1
NBVC NR In House		Identify and ensure departments prioritize and allocate funding to support compliance requirements.	1
NBVC NR In House		Seek awards for natural resource work conducted at SNI.	1
NBVC NR In House		Continue to ensure effective communication, adaptive oversight, and policy leadership through the USDON Natural Resources Strategic Plan.	1

Table C-18. SNI INRMP List of Natural Resource Management Projects - 2028 .

Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level
O&MN	69232B0094	Integrated Natural Resources Management Plan revisions and associated Environmental Assessment to incorporate current resources and management knowledge.	1
NBVC NR In House		Apply sustainability principles to the management of habitats, species, and ecological functions on SNI by identifying resource-specific best practices similar to Sustainable Sites Initiatives (SSI) approaches.	1
NBVC NR In House		Protect the natural ecological integrity, structure, and functional values of the wetlands and floodplains on SNI.	1
O&MN	63126EPRMarine	Collect baseline information and establish monitoring protocols for sandy beach communities to support management to maintain habitat integrity.	1
O&MN	63126EPRMarine	Continue rocky intertidal surveys and encourage additional monitoring at SNI consistent with monitoring performed at the other Channel Islands and throughout California, to establish regional trends and understand site specific change.	1
O&MN	63126EPRMarine	Develop and implement unvegetated and vegetated soft bottom monitoring protocols at SNI to determine resource status and extent of submerged aquatic vegetation (eelgrass).	1
O&MN	63126EPRMarine	Support establishment of kelp forest ecosystem monitoring locations around SNI while encouraging state and federal agencies and academic researchers to investigate important community related questions involving recruitment, disturbance, and species diversity that help to assess regional trends.	1
NBVC NR In House		Develop management strategies through partnerships with the BLM to support the management of the Begg Rock State Marine Reserve and of the offshore rocks near SNI and Begg Rock that are designated as part of the CCNM.	1
O&MN	63126XXX97	Collect baseline information on the invertebrate community of SNI, with particular emphasis on endemics and pollinators.	1
O&MN	63126XXX85	Conduct regular monitoring of reptiles and amphibians in addition to island night lizard monitoring and develop accurate GIS data layers for known populations and conserve habitat associations to avoid sensitive areas and minimize potential impacts.	1
O&MN	63126EPRBird	Migratory and resident bird inventory and restoration management activities to conserve bird population and develop and maintain information on status and trend of population and habitats.	1
O&MN	63126XXX86	Monitor resident seabird populations and breeding colonies to track the sustainability of populations and their habitat.	1
NBVC NR In House		Implement bird conservation principles, measures, and practices through avoidance and minimization measures to protect resident and migratory bird populations.	1
Research Institutions		Support small mammal monitoring programs at SNI to adapt management strategies based on current population status.	1
O&MN	63126B0067	Inventory and monitor bat populations on SNI to adapt management strategies based on current population status.	1
O&MN	63126EPRMarine	Collect community level marine macroalgae baseline information surveys to support focused management efforts and identify indicator species. Survey subtidal and intertidal areas near high use locations (pier and barge landing areas) for the introduction of non-native invasive species.	1
O&MN	63126EPRMarine	Develop a fish monitoring program and management plan to conserve fish population abundance and habitat diversity.	1
O&MN	63126XXX88	Monitor island-wide pinniped breeding and haul out sites and periodic evaluation of current adaptive management practices.	1
Navy Tenant Funded	63126B003	Ensure that land use plans and activities in or near threatened or endangered species habitats are accomplished in accordance with the ESA in accordance with current Biological Opinions and with ESA Section 7 Consultation Handbook (USFWS/NMFS March 1998).	1
O&MN	63126B003	Per USFWS Biological Opinion (2001) provide the USFWS an annual report containing the number of island night lizards, California brown pelicans, and western snowy plover killed or injured by Navy activities, and a summary of Navy activities and their effects on listed species in accordance with the Reporting Requirements in the BO (USFWS 2001).	1
O&MN	63126XXX85	Support recovery plan efforts to establish stable island night lizard populations and eventual delisting by conducting site specific surveys prior to disturbance activities, implementing avoidance and minimization measures, and conducting studies to investigate the effectiveness of island night lizard management strategies with respect to impacts from alligator lizards and the relocation island night lizards.	1
Navy Tenant Funded	63126B003	Support recovery plan efforts to establish stable western snowy plover populations and eventual delisting by closing nesting areas to recreational activity during the March 1 - September 15 breeding season and by removing unnecessary structures in nesting areas.	1
Navy Tenant Funded	63126B003	Support recovery plan efforts to establish stable western snowy plover populations and eventual delisting by monitoring the effects of Navy activities on snowy plovers through conducting island-wide snowy plover censuses twice annually, once during the breeding season and once during the winter season, and through monitoring snowy plover nests during missile or target launches, general operations, and other activities that may disturb nesting behaviors.	1
O&MN	63126EPRBlackAb	Support recovery plan efforts to establish stable black abalone populations through continuing to conduct presence and absence surveys and through developing and implementing annual abalone monitoring protocols.	1
O&MN	63126EPRBlackAb	Continue to support appropriate closures at SNI and continue to review all military activities to ensure that they are in compliance with ESA and to avoid or minimize impacts to black abalone.	1
O&MN	63126EPRMarine	Support recovery plan efforts to establish stable white abalone populations by facilitating efforts to identify white abalone habitat and determine densities of individuals around SNI.	1

Table C-18. SNI INRMP List of Natural Resource Management Projects - 2028 (Continued).

Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level
NBVC NR In House / Research Institutions		Support ongoing and new research on distribution and ecology of the Guadalupe fur seal. Encourage academic institutions to collect resource data. Record all sightings of Guadalupe fur seals and develop a database to track numbers of individuals, time of year, and location.	1
NBVC NR In House		Provide for the recovery, enhancement, and protection of species warranting Navy stewardship, as a proactive strategy to prevent federal listings and continue to resolve baseline biological data gaps.	1
O&MN	63126XXX97	Collect baseline information on the special status native invertebrate species of SNI.	1
O&MN	63126EPRBird	Provide for the recovery, enhancement, and protection of Xantus's murrelets, as a proactive strategy to prevent federal listings and continue to resolve baseline biological data gaps.	1
O&MN	63126EPRBird	Provide for the recovery, enhancement, and protection of ashy storm-petrels, as a proactive strategy to prevent federal listings and continue to resolve baseline biological data gaps.	1
Navy Tenant Funded	63126XXX93	Maintain a viable population of the San Nicolas Island fox by reducing negative, human-caused impacts and remaining an active participant with other agencies regarding island fox issues.	1
Research Institutions		Determine the status of deer mouse populations and conserve and protect deer mouse habitat.	1
O&MN	63126EPRMarine	Support ongoing and new research on distribution and ecology of the southern sea otter at SNI. Encourage academic institutions to facilitate resource data collection and record all sightings of southern sea otters at SNI and develop a database to track numbers of individuals, time of year, and location.	1
O&MN	69232XXX90	Update and implement the invasive non-native plant species management and eradication program to insure use of existing BMPs to reduce the introduction of invasive species, establish early detection and rapid response protocol, map and prioritize most problematic terrestrial invasive non-native species populations, and maintain consistency with long-term protection of native plant communities.	1
O&MN	6923224086	Develop and implement a biosecurity plan to ensure invasive terrestrial fauna and flora are not brought to SNI by providing prevention, early detection, rapid response, and education guidelines.	1
O&MN	6923224086	Assess and monitor the progress and success of the removal of feral cats to support the shorebird enhancement project.	1
O&MN	63126EPRMarineInvasives	Develop and implement a plan to prevent the introduction of invasive non-native marine and coastal species into SNI waters which includes a standardized monitoring system focused on early detection for high priority aquatic invasive species, rapid response protocol, and promotes when an invasive is detected. Promote cooperative interagency efforts to collect and analyze comprehensive monitoring data.	1
NBVC NR In House		Minimize the introduction of pest species to SNI. Develop a rodent control /removal plan and implement if introduced species are detected. Determine presence or absence of non-native rodents.	1
NBVC NR In House / Research Institutions		Set up a central clearinghouse for data, reports, and publications pertaining to the NBVC's EMS that addresses natural resources and that is accessible to staff.	1
NBVC NR In House		Maintain habitats using principles of ecosystem management and sustainability and continue to use NEPA documentation. Define benefit or impact to the military mission.	1
O&MN	63126EPRClimateChange	Control and reduce greenhouse gas emissions by improving governance, implementing the SNI Net Zero Energy Installation Plan, providing energy conservation education, and addressing impacts in NEPA documents.	1
NBVC NR In House / Project Proponent		Promote training in sustainable design criteria for Navy staff and apply sustainability principles to the management of natural resources and the built environment by using metrics (indicators) of sustainability and by adopting LEED, LID, and Sustainable Sites Initiative approaches while continuing to use RSIP, master planning, site approval, and NEPA processes.	1
NBVC NR In House		Establish protocols for emergency and regular repair of infrastructure so that human life, health and safety are given precedence, but sensitive resources are also protected. Consider fish and wildlife conservation in all site feasibility studies and during project planning, design and construction.	1
NBVC NR In House / Project Proponent		Ensure siting criteria are addressed through the Project Review Board (NBVCINST 11010.1). Any proposed towers will also comply with USFWS guidelines for reducing fatal bird strikes to the greatest extent practicable.	1
NBVC NR In House		Participate in conservation, ecosystem, invasive species, and feral animal control planning in collaboration with other government agencies.	1
NBVC NR In House		Seek out and encourage partners to support independent scientific research and to develop cooperative research agreements focused on examining marine recruitment processes of important indicator species or species of concern.	1
NBVC NR In House		Remain an active participant with other agencies regarding San Nicolas Island fox and San Nicolas Island deer mouse issues.	1
NBVC NR In House		Support the integration of SNI into the Invasive Species Task Force on Santa Cruz Island and other Channel Islands as opportunities arise.	1
NBVC NR In House		Promote cooperative interagency efforts to collect and analyze comprehensive aquatic invasive species monitoring data, including shared funding and staff.	1
NBVC NR In House		Consult with USFWS and CDFG at least annually to fulfill SAIA provisions and related inter-agency cooperative agreements.	1
NBVC NR In House		Consider the use of Cooperative Agreements to get work done, especially research. A long-term advisory relationship and cooperative research relationship could continue with local universities.	1
NBVC NR In House		Establish and implement clear, coherent policies regarding public access to SNI including the near shore environment. Take active measures to discourage trespass and minimize the impacts of unauthorized access.	1

Table C-18. SNI INRMP List of Natural Resource Management Projects - 2028 (Continued).

Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level
NBVC NR In House		Identify natural resource themes for public outreach. Participate in Earth Day and annual science festivals that occur in adjacent communities on the mainland.	1
NBVC NR In House		Ensure consistency with Coastal Zone Plans.	1
NBVC NR In House		Continue to participate in the Project Review Board and the Site Approval and Project Review Process and coordinate with the Cultural Resources program.	1
NBVC NR In House		Continue to use NEPA planning processes and documentation to guide specific projects and document choices and enforce mitigation measures proposed in those NEPA documents.	1
NBVC NR In House		Collect and distribute data on sediment contamination to minimize risks to recreational and commercial water contact users, recreational and commercial fisheries, and to wildlife species.	1
NBVC NR In House		Support research to improve the adequacy of cumulative effects analysis, standardize the format in documents, and develop and implement compensation for cumulative effects.	1
NBVC NR In House		Conserve existing habitat values by promoting experimentation and application of alternative shoreline and underwater habitat structures. Encourage refitting of developed shorelines and existing structures to enhance habitat values.	1
NBVC NR In House		Promote experimentation and application of alternative LID and habitat-friendly landscaped areas adjacent to the shore.	1
NBVC NR In House		Implement this INRMP by applying it as an initial screen for review of projects proposed on the installation from both Navy and outside interests to improve the success of mitigation and enhancement projects based on regulatory, functional, and ecosystem criteria.	1
NBVC NR In House		Enforce Seasonal Avoidance Measures and Standard Mitigation Measures.	1
O&MN	63126EPREducation	Improve SNI community and environmental outreach through facilitating development of environmental education curriculum for researchers, personnel, and contractors. This will be accomplished by developing and distributing educational material, expanding education partnerships, by securing long-term funding to continue environmental education programs (e.g. brochures and videos), and evaluate the effectiveness of existing environmental education programs.	1
NBVC NR In House		Provide information and education for the enforcement of natural resource laws and regulations by professionally trained personnel such as federal and state Conservation Officers.	1
NBVC NR In House		Maintain staff knowledge through training and participation in natural resource research and conservation programs and share information with natural resource experts.	1
NBVC NR In House		Provide a notice of the intent to revise the INRMP to the USFWS and CDFG if a revision is found necessary.	1
NBVC NR In House		Comply with recent CNI draft guidance on INRMPs and continue to utilize the INRMP Metrics Builder to assess implementation.	1
NBVC NR In House		Provide funding and support for research and other studies to further SNI natural resources management.	1
NBVC NR In House		Provide documentation to secure appropriate levels of NBVC NR In House funding to support natural resource management programs.	1
NBVC NR In House		Develop prioritized lists of proposed management efforts to guide development of funding proposals.	1
NBVC NR In House		Develop plans and documentation to secure external funding and continue to request external funding from other state and federal agencies.	1
NBVC NR In House		Support scientific, academic, and volunteer efforts to initiate or supplement natural resources management programs.	1
NBVC NR In House		Identify and ensure departments prioritize and allocate funding to support compliance requirements.	1
NBVC NR In House		Seek awards for natural resource work conducted at SNI.	1
NBVC NR In House		Continue to ensure effective communication, adaptive oversight, and policy leadership through the USDON Natural Resources Strategic Plan.	1

Table C-19. SNI INRMP List of Natural Resource Management Projects - 2029 .

Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level
O&MN	69232B0094	Integrated Natural Resources Management Plan revisions and associated Environmental Assessment to incorporate current resources and management knowledge.	1
NBVC NR In House		Apply sustainability principles to the management of habitats, species, and ecological functions on SNI by identifying resource-specific best practices similar to Sustainable Sites Initiatives (SSI) approaches.	1
NBVC NR In House		Protect the natural ecological integrity, structure, and functional values of the wetlands and floodplains on SNI.	1
O&MN	63126XXX85	Conduct regular monitoring of reptiles and amphibians in addition to island night lizard monitoring and develop accurate GIS data layers for known populations and conserve habitat associations to avoid sensitive areas and minimize potential impacts.	1
O&MN	63126EPRBird	Migratory and resident bird inventory and restoration management activities to conserve bird population and develop and maintain information on status and trend of population and habitats.	1
O&MN	63126XXX86	Monitor resident seabird populations and breeding colonies to track the sustainability of populations and their habitat.	1
NBVC NR In House		Implement bird conservation principles, measures, and practices through avoidance and minimization measures to protect resident and migratory bird populations.	1
O&MN	63126B0067	Inventory and monitor bat populations on SNI to adapt management strategies based on current population status.	1
O&MN	63126XXX88	Monitor island-wide pinniped breeding and haul out sites and periodic evaluation of current adaptive management practices.	1
Navy Tenant Funded	63126B003	Ensure that land use plans and activities in or near threatened or endangered species habitats are accomplished in accordance with the ESA in accordance with current Biological Opinions and with ESA Section 7 Consultation Handbook (USFWS/NMFS March 1998).	1
O&MN	63126B003	Per USFWS Biological Opinion (2001) provide the USFWS an annual report containing the number of island night lizards, California brown pelicans, and western snowy plover killed or injured by Navy activities, and a summary of Navy activities and their effects on listed species in accordance with the Reporting Requirements in the BO (USFWS 2001).	1
O&MN	63126XXX85	Support recovery plan efforts to establish stable island night lizard populations and eventual delisting by conducting site specific surveys prior to disturbance activities, implementing avoidance and minimization measures, and conducting studies to investigate the effectiveness of island night lizard management strategies with respect to impacts from alligator lizards and the relocation island night lizards.	1
Navy Tenant Funded	63126B003	Support recovery plan efforts to establish stable western snowy plover populations and eventual delisting by closing nesting areas to recreational activity during the March 1 - September 15 breeding season and by removing unnecessary structures in nesting areas.	1
Navy Tenant Funded	63126B003	Support recovery plan efforts to establish stable western snowy plover populations and eventual delisting by monitoring the effects of Navy activities on snowy plovers through conducting island-wide snowy plover censuses twice annually, once during the breeding season and once during the winter season, and through monitoring snowy plover nests during missile or target launches, general operations, and other activities that may disturb nesting behaviors.	1
O&MN	63126EPRBlackAb	Support recovery plan efforts to establish stable black abalone populations through continuing to conduct presence and absence surveys and through developing and implementing annual abalone monitoring protocols.	1
O&MN	63126EPRBlackAb	Continue to support appropriate closures at SNI and continue to review all military activities to ensure that they are in compliance with ESA and to avoid or minimize impacts to black abalone.	1
O&MN	63126EPRMarine	Support recovery plan efforts to establish stable white abalone populations by facilitating efforts to identify white abalone habitat and determine densities of individuals around SNI.	1
NBVC NR In House / Research Institutions		Support ongoing and new research on distribution and ecology of the Guadalupe fur seal. Encourage academic institutions to collect resource data. Record all sightings of Guadalupe fur seals and develop a database to track numbers of individuals, time of year, and location.	1
NBVC NR In House		Provide for the recovery, enhancement, and protection of species warranting Navy stewardship, as a proactive strategy to prevent federal listings and continue to resolve baseline biological data gaps.	1
O&MN	63126EPRBird	Provide for the recovery, enhancement, and protection of Xantus's murrelets, as a proactive strategy to prevent federal listings and continue to resolve baseline biological data gaps.	1
O&MN	63126EPRBird	Provide for the recovery, enhancement, and protection of ashy storm-petrels, as a proactive strategy to prevent federal listings and continue to resolve baseline biological data gaps.	1
Navy Tenant Funded	63126XXX93	Maintain a viable population of the San Nicolas Island fox by reducing negative, human-caused impacts and remaining an active participant with other agencies regarding island fox issues.	1
Research Institutions		Determine the status of deer mouse populations and conserve and protect deer mouse habitat.	1
O&MN	63126EPRMarine	Support ongoing and new research on distribution and ecology of the southern sea otter at SNI. Encourage academic institutions to facilitate resource data collection and record all sightings of southern sea otters at SNI and develop a database to track numbers of individuals, time of year, and location.	1

Table C-19. SNI INRMP List of Natural Resource Management Projects - 2029 (Continued).

Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level
O&MN	69232XXX90	Update and implement the invasive non-native plant species management and eradication program to insure use of existing BMPs to reduce the introduction of invasive species, establish early detection and rapid response protocol, map and prioritize most problematic terrestrial invasive non-native species populations, and maintain consistency with long-term protection of native plant communities.	1
O&MN	6923224086	Develop and implement a biosecurity plan to ensure invasive terrestrial fauna and flora are not brought to SNI by providing prevention, early detection, rapid response, and education guidelines.	1
O&MN	6923224086	Assess and monitor the progress and success of the removal of feral cats to support the shorebird enhancement project.	1
O&MN	63126EPRMarineInvasives	Develop and implement a plan to prevent the introduction of invasive non-native marine and coastal species into SNI waters which includes a standardized monitoring system focused on early detection for high priority aquatic invasive species, rapid response protocol, and promotes when an invasive is detected. Promote cooperative interagency efforts to collect and analyze comprehensive monitoring data.	1
NBVC NR In House		Minimize the introduction of pest species to SNI. Develop a rodent control /removal plan and implement if introduced species are detected. Determine presence or absence of non-native rodents.	1
NBVC NR In House / Research Institutions		Set up a central clearinghouse for data, reports, and publications pertaining to the NBVC's EMS that addresses natural resources and that is accessible to staff.	1
NBVC NR In House		Maintain habitats using principles of ecosystem management and sustainability and continue to use NEPA documentation. Define benefit or impact to the military mission.	1
O&MN	63126EPRClimateChange	Control and reduce greenhouse gas emissions by improving governance, implementing the SNI Net Zero Energy Installation Plan, providing energy conservation education, and addressing impacts in NEPA documents.	1
NBVC NR In House / Project Proponent		Promote training in sustainable design criteria for Navy staff and apply sustainability principles to the management of natural resources and the built environment by using metrics (indicators) of sustainability and by adopting LEED, LID, and Sustainable Sites Initiative approaches while continuing to use RSIP, master planning, site approval, and NEPA processes.	1
NBVC NR In House		Establish protocols for emergency and regular repair of infrastructure so that human life, health and safety are given precedence, but sensitive resources are also protected. Consider fish and wildlife conservation in all site feasibility studies and during project planning, design and construction.	1
NBVC NR In House / Project Proponent		Ensure siting criteria are addressed through the Project Review Board (NBVCINST 11010.1). Any proposed towers will also comply with USFWS guidelines for reducing fatal bird strikes to the greatest extent practicable.	1
NBVC NR In House		Participate in conservation, ecosystem, invasive species, and feral animal control planning in collaboration with other government agencies.	1
NBVC NR In House		Seek out and encourage partners to support independent scientific research and to develop cooperative research agreements focused on examining marine recruitment processes of important indicator species or species of concern.	1
NBVC NR In House		Remain an active participant with other agencies regarding San Nicolas Island fox and San Nicolas Island deer mouse issues.	1
NBVC NR In House		Support the integration of SNI into the Invasive Species Task Force on Santa Cruz Island and other Channel Islands as opportunities arise.	1
NBVC NR In House		Promote cooperative interagency efforts to collect and analyze comprehensive aquatic invasive species monitoring data, including shared funding and staff.	1
NBVC NR In House		Consult with USFWS and CDFG at least annually to fulfill SAIA provisions and related inter-agency cooperative agreements.	1
NBVC NR In House		Consider the use of Cooperative Agreements to get work done, especially research. A long-term advisory relationship and cooperative research relationship could continue with local universities.	1
NBVC NR In House		Establish and implement clear, coherent policies regarding public access to SNI including the near shore environment. Take active measures to discourage trespass and minimize the impacts of unauthorized access.	1
NBVC NR In House		Identify natural resource themes for public outreach. Participate in Earth Day and annual science festivals that occur in adjacent communities on the mainland.	1
NBVC NR In House		Ensure consistency with Coastal Zone Plans.	1
NBVC NR In House		Continue to participate in the Project Review Board and the Site Approval and Project Review Process and coordinate with the Cultural Resources program.	1
NBVC NR In House		Continue to use NEPA planning processes and documentation to guide specific projects and document choices and enforce mitigation measures proposed in those NEPA documents.	1
NBVC NR In House		Support research to improve the adequacy of cumulative effects analysis, standardize the format in documents, and develop and implement compensation for cumulative effects.	1
NBVC NR In House		Conserve existing habitat values by promoting experimentation and application of alternative shoreline and underwater habitat structures. Encourage refitting of developed shorelines and existing structures to enhance habitat values.	1
NBVC NR In House		Promote experimentation and application of alternative LID and habitat-friendly landscaped areas adjacent to the shore.	1
NBVC NR In House		Implement this INRMP by applying it as an initial screen for review of projects proposed on the installation from both Navy and outside interests to improve the success of mitigation and enhancement projects based on regulatory, functional, and ecosystem criteria.	1

Table C-19. SNI INRMP List of Natural Resource Management Projects - 2029 (Continued).

Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level
NBVC NR In House		Enforce Seasonal Avoidance Measures and Standard Mitigation Measures.	1
O&MN	63126EPREducation	Improve SNI community and environmental outreach through facilitating development of environmental education curriculum for researchers, personnel, and contractors. This will be accomplished by developing and distributing educational material, expanding education partnerships, by securing long-term funding to continue environmental education programs (e.g. brochures and videos), and evaluate the effectiveness of existing environmental education programs.	1
NBVC NR In House		Provide information and education for the enforcement of natural resource laws and regulations by professionally trained personnel such as federal and state Conservation Officers.	1
NBVC NR In House		Maintain staff knowledge through training and participation in natural resource research and conservation programs and share information with natural resource experts.	1
NBVC NR In House		Provide a notice of the intent to revise the INRMP to the USFWS and CDFG if a revision is found necessary.	1
NBVC NR In House		Comply with recent CNI draft guidance on INRMPs and continue to utilize the INRMP Metrics Builder to assess implementation.	1
NBVC NR In House		Provide funding and support for research and other studies to further SNI natural resources management.	1
NBVC NR In House		Provide documentation to secure appropriate levels of NBVC NR In House funding to support natural resource management programs.	1
NBVC NR In House		Develop prioritized lists of proposed management efforts to guide development of funding proposals.	1
NBVC NR In House		Develop plans and documentation to secure external funding and continue to request external funding from other state and federal agencies.	1
NBVC NR In House		Support scientific, academic, and volunteer efforts to initiate or supplement natural resources management programs.	1
NBVC NR In House		Identify and ensure departments prioritize and allocate funding to support compliance requirements.	1
NBVC NR In House		Seek awards for natural resource work conducted at SNI.	1
NBVC NR In House		Continue to ensure effective communication, adaptive oversight, and policy leadership through the USDON Natural Resources Strategic Plan.	1

Table C-20. SNI INRMP List of Natural Resource Management Projects - 2030 .

Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level
O&MN	69232B0094	Integrated Natural Resources Management Plan revisions and associated Environmental Assessment to incorporate current resources and management knowledge.	1
NBVC NR In House		Apply sustainability principles to the management of habitats, species, and ecological functions on SNI by identifying resource-specific best practices similar to Sustainable Sites Initiatives (SSI) approaches.	1
NBVC Other Navy In House		Update as needed and implement Storm Water Pollution Prevention Plan (SWPPP).	1
O&MN	63126EPRErosion	Develop and implement an erosion control plan.	1
O&MN	63126EPRFire	Develop and implement a Wildland Fire Management Plan (WFMP) for SNI.	1
O&MN	63126XXX89	Inventory plant species diversity, abundance, and density to develop priorities for monitoring that establishes ranking system, sensitive species habitat, and creates criteria for restoration work while define the extent, nature, and value of vegetation resources of SNI.	1
O&MN	63126EPRDune	Develop and implement a dune drift management plan to determine effective alternatives to manage dune drift impact to roads, operations, and natural resources.	1
O&MN	63126XXX87	Maintain a current inventory of wetlands to support planning and management efforts to achieve no net loss of wetlands.	1
NBVC NR In House		Protect the natural ecological integrity, structure, and functional values of the wetlands and floodplains on SNI.	1
O&MN	63126EPRMarine	Collect baseline information and establish monitoring protocols for sandy beach communities to support management to maintain habitat integrity.	1
O&MN	63126EPRMarine	Continue rocky intertidal surveys and encourage additional monitoring at SNI consistent with monitoring performed at the other Channel Islands and throughout California, to establish regional trends and understand site specific change.	1
O&MN	63126EPRMarine	Develop and implement unvegetated and vegetated soft bottom monitoring protocols at SNI to determine resource status and extent of submerged aquatic vegetation (eelgrass).	1
O&MN	63126EPRMarine	Support establishment of kelp forest ecosystem monitoring locations around SNI while encouraging state and federal agencies and academic researchers to investigate important community related questions involving recruitment, disturbance, and species diversity that help to assess regional trends.	1
NBVC NR In House		Develop management strategies through partnerships with the BLM to support the management of the Begg Rock State Marine Reserve and of the offshore rocks near SNI and Begg Rock that are designated as part of the CCNM.	1
O&MN	63126XXX85	Conduct regular monitoring of reptiles and amphibians in addition to island night lizard monitoring and develop accurate GIS data layers for known populations and conserve habitat associations to avoid sensitive areas and minimize potential impacts.	1
O&MN	63126EPRBird	Migratory and resident bird inventory and restoration management activities to conserve bird population and develop and maintain information on status and trend of population and habitats.	1
O&MN	63126XXX86	Monitor resident seabird populations and breeding colonies to track the sustainability of populations and their habitat.	1
NBVC NR In House		Implement bird conservation principles, measures, and practices through avoidance and minimization measures to protect resident and migratory bird populations.	1
O&MN	63126B0067	Inventory and monitor bat populations on SNI to adapt management strategies based on current population status.	1
O&MN	63126EPRMarine	Collect community level marine macroalgae baseline information surveys to support focused management efforts and identify indicator species. Survey subtidal and intertidal areas near high use locations (pier and barge landing areas) for the introduction of non-native invasive species.	1
O&MN	63126EPRMarine	Develop and implement a marine resource stewardship plan.	1
O&MN	63126XXX88	Monitor island-wide pinniped breeding and haul out sites and periodic evaluation of current adaptive management practices.	1
Navy Tenant Funded	63126B003	Ensure that land use plans and activities in or near threatened or endangered species habitats are accomplished in accordance with the ESA in accordance with current Biological Opinions and with ESA Section 7 Consultation Handbook (USFWS/NMFS March 1998).	1
O&MN	63126B003	Per USFWS Biological Opinion (2001) provide the USFWS an annual report containing the number of island night lizards, California brown pelicans, and western snowy plover killed or injured by Navy activities, and a summary of Navy activities and their effects on listed species in accordance with the Reporting Requirements in the BO (USFWS 2001).	1
O&MN	63126XXX85	Support recovery plan efforts to establish stable island night lizard populations and eventual delisting by conducting site specific surveys prior to disturbance activities, implementing avoidance and minimization measures, and conducting studies to investigate the effectiveness of island night lizard management strategies with respect to impacts from alligator lizards and the relocation island night lizards.	1
Navy Tenant Funded	63126B003	Support recovery plan efforts to establish stable western snowy plover populations and eventual delisting by closing nesting areas to recreational activity during the March 1 - September 15 breeding season and by removing unnecessary structures in nesting areas.	1

Table C-20. SNI INRMP List of Natural Resource Management Projects - 2030 (Continued).

Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level
Navy Tenant Funded	63126B003	Support recovery plan efforts to establish stable western snowy plover populations and eventual delisting by monitoring the effects of Navy activities on snowy plovers through conducting island-wide snowy plover censuses twice annually, once during the breeding season and once during the winter season, and through monitoring snowy plover nests during missile or target launches, general operations, and other activities that may disturb nesting behaviors.	1
O&MN	63126EPRBlackAb	Support recovery plan efforts to establish stable black abalone populations through continuing to conduct presence and absence surveys and through developing and implementing annual abalone monitoring protocols.	1
O&MN	63126EPRBlackAb	Continue to support appropriate closures at SNI and continue to review all military activities to ensure that they are in compliance with ESA and to avoid or minimize impacts to black abalone.	1
O&MN	63126EPRMarine	Support recovery plan efforts to establish stable white abalone populations by facilitating efforts to identify white abalone habitat and determine densities of individuals around SNI.	1
NBVC NR In House / Research Institutions		Support ongoing and new research on distribution and ecology of the Guadalupe fur seal. Encourage academic institutions to collect resource data. Record all sightings of Guadalupe fur seals and develop a database to track numbers of individuals, time of year, and location.	NBVC NR In House / Research Institutions
NBVC NR In House		Provide for the recovery, enhancement, and protection of species warranting Navy stewardship, as a proactive strategy to prevent federal listings and continue to resolve baseline biological data gaps.	NBVC NR In House
O&MN	63126EPRRarePlant	Collect data on the habitat and reproductive requirements for sensitive endemic plants species for conservation and management efforts.	O&MN
O&MN	63126EPRBird	Provide for the recovery, enhancement, and protection of Xantus's murrelets, as a proactive strategy to prevent federal listings and continue to resolve baseline biological data gaps.	O&MN
O&MN	63126EPRBird	Provide for the recovery, enhancement, and protection of ashy storm-petrels, as a proactive strategy to prevent federal listings and continue to resolve baseline biological data gaps.	O&MN
Navy Tenant Funded	63126XXX93	Maintain a viable population of the San Nicolas Island fox by reducing negative, human-caused impacts and remaining an active participant with other agencies regarding island fox issues.	1
Research Institutions		Determine the status of deer mouse populations and conserve and protect deer mouse habitat.	1
O&MN	63126EPRMarine	Support ongoing and new research on distribution and ecology of the southern sea otter at SNI. Encourage academic institutions to facilitate resource data collection and record all sightings of southern sea otters at SNI and develop a database to track numbers of individuals, time of year, and location.	1
O&MN	69232XXX90	Update and implement the invasive non-native plant species management and eradication program to insure use of existing BMPs to reduce the introduction of invasive species, establish early detection and rapid response protocol, map and prioritize most problematic terrestrial invasive non-native species populations, and maintain consistency with long-term protection of native plant communities.	1
O&MN	6923224086	Develop and implement a biosecurity plan to ensure invasive terrestrial fauna and flora are not brought to SNI by providing prevention, early detection, rapid response, and education guidelines.	1
O&MN	6923224086	Assess and monitor the progress and success of the removal of feral cats to support the shorebird enhancement project.	1
O&MN	63126EPRMarineInvasives	Develop and implement a plan to prevent the introduction of invasive non-native marine and coastal species into SNI waters which includes a standardized monitoring system focused on early detection for high priority aquatic invasive species, rapid response protocol, and promotes when an invasive is detected. Promote cooperative interagency efforts to collect and analyze comprehensive monitoring data.	1
Naval Air Operations		Survey and monitor avian species utilizing airfield and document bird strikes and carcasses adjacent to airfield.	1
Naval Air Operations		Develop and implement a BASH Plan and conduct a Wildlife Hazard Assessment for SNI.	1
NBVC NR In House		Minimize the introduction of pest species to SNI. Develop a rodent control /removal plan and implement if introduced species are detected. Determine presence or absence of non-native rodents.	1
NBVC NR In House / Research Institutions		Set up a central clearinghouse for data, reports, and publications pertaining to the NBVC's EMS that addresses natural resources and that is accessible to staff.	1
NBVC NR In House		Maintain habitats using principles of ecosystem management and sustainability and continue to use NEPA documentation. Define benefit or impact to the military mission.	1
O&MN	63126EPRClimateChange	Control and reduce greenhouse gas emissions by improving governance, implementing the SNI Net Zero Energy Installation Plan, providing energy conservation education, and addressing impacts in NEPA documents.	1
NBVC NR In House / NBVC Other Navy In House / Project Proponent		Update and implement the SNI Net Zero Energy Installation Plan to reduce dependency on jet fuel and thereby reducing air and water quality impacts.	1

Table C-20. SNI INRMP List of Natural Resource Management Projects - 2030 (Continued).

Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level
NBVC NR In House / Project Proponent		Promote training in sustainable design criteria for Navy staff and apply sustainability principles to the management of natural resources and the built environment by using metrics (indicators) of sustainability and by adopting LEED, LID, and Sustainable Sites Initiative approaches while continuing to use RSIP, master planning, site approval, and NEPA processes.	1
NBVC NR In House		Develop and implement a SAP at an organizational level.	1
NBVC NR In House		Establish protocols for emergency and regular repair of infrastructure so that human life, health and safety are given precedence, but sensitive resources are also protected. Consider fish and wildlife conservation in all site feasibility studies and during project planning, design and construction.	1
O&MN	63126EPRRoad	Develop and implement an Island Road Long-term Maintenance Plan that updates and improves road maintenance best management practices, applies the principles of "Integrated Vegetation Management", and adopts mowing instructions to meet multiple objectives for roadside maintenance to alleviate harmful environmental impacts and enhance possible benefits. Adopt a Mowing Instruction that provides roadside fire safety and minimizes detrimental environmental effects. Comply with CWA Section 404 Permit and Section 401 State Water Quality Certification.	1
NBVC NR In House / Project Proponent		Ensure siting criteria are addressed through the Project Review Board (NBVCINST 11010.1). Any proposed towers will also comply with USFWS guidelines for reducing fatal bird strikes to the greatest extent practicable.	1
NBVC NR In House		Participate in conservation, ecosystem, invasive species, and feral animal control planning in collaboration with other government agencies.	1
NBVC NR In House		Seek out and encourage partners to support independent scientific research and to develop cooperative research agreements focused on examining marine recruitment processes of important indicator species or species of concern.	1
NBVC NR In House		Remain an active participant with other agencies regarding San Nicolas Island fox and San Nicolas Island deer mouse issues.	1
NBVC NR In House		Support the integration of SNI into the Invasive Species Task Force on Santa Cruz Island and other Channel Islands as opportunities arise.	1
NBVC NR In House		Promote cooperative interagency efforts to collect and analyze comprehensive aquatic invasive species monitoring data, including shared funding and staff.	1
NBVC NR In House		Consult with USFWS and CDFG at least annually to fulfill SAIA provisions and related inter-agency cooperative agreements.	1
NBVC NR In House		Consider the use of Cooperative Agreements to get work done, especially research. A long-term advisory relationship and cooperative research relationship could continue with local universities.	1
NBVC NR In House		Establish and implement clear, coherent policies regarding public access to SNI including the near shore environment. Take active measures to discourage trespass and minimize the impacts of unauthorized access.	1
NBVC NR In House		Identify natural resource themes for public outreach. Participate in Earth Day and annual science festivals that occur in adjacent communities on the mainland.	1
NBVC NR In House		Ensure consistency with Coastal Zone Plans.	1
NBVC NR In House		Continue to participate in the Project Review Board and the Site Approval and Project Review Process and coordinate with the Cultural Resources program.	1
NBVC NR In House		Continue to use NEPA planning processes and documentation to guide specific projects and document choices and enforce mitigation measures proposed in those NEPA documents.	1
NBVC NR In House		Revise and implement the Storm Water Pollution Prevention Plan and water quality protection efforts throughout the SNI watershed.	1
NBVC NR In House		Integrate the protection priorities of this INRMP into the Emergency Response Action Plan and the Integrated Contingency Plan for Oil and Hazardous Substance Spill Prevention and Response.	1
NBVC NR In House		Support research to improve the adequacy of cumulative effects analysis, standardize the format in documents, and develop and implement compensation for cumulative effects.	1
NBVC NR In House		Conserve existing habitat values by promoting experimentation and application of alternative shoreline and underwater habitat structures. Encourage refitting of developed shorelines and existing structures to enhance habitat values.	1
NBVC NR In House		Promote experimentation and application of alternative LID and habitat-friendly landscaped areas adjacent to the shore.	1
NBVC NR In House		Implement this INRMP by applying it as an initial screen for review of projects proposed on the installation from both Navy and outside interests to improve the success of mitigation and enhancement projects based on regulatory, functional, and ecosystem criteria.	1
NBVC NR In House		Enforce Seasonal Avoidance Measures and Standard Mitigation Measures.	1
O&MN	63126EPRLandscape	Develop, implement, and revise as needed a Landscaping and Grounds Maintenance Plan and Instruction that outlines an appropriate landscaping and grounds maintenance program (e.g. that considers environmental factors and that adopts an Integrated Pest Management approach) to dealing with pest problems.	1
NBVC NR In House		Develop, implement, and update as need an Outdoor Recreation Plan that identifies and evaluates suitable outdoor recreation opportunities for installation personnel in undeveloped areas and that continues to limit public access and outdoor recreation that are not consistent with the military mission at SNI.	1

Table C-20. SNI INRMP List of Natural Resource Management Projects - 2030 (Continued).

Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level
O&MN	63126EPREducation	Improve SNI community and environmental outreach through facilitating development of environmental education curriculum for researchers, personnel, and contractors. This will be accomplished by developing and distributing educational material, expanding education partnerships, by securing long-term funding to continue environmental education programs (e.g. brochures and videos), and evaluate the effectiveness of existing environmental education programs.	1
NBVC NR In House		Provide information and education for the enforcement of natural resource laws and regulations by professionally trained personnel such as federal and state Conservation Officers.	1
NBVC NR In House		Maintain staff knowledge through training and participation in natural resource research and conservation programs and share information with natural resource experts.	1
NBVC NR In House		Provide a notice of the intent to revise the INRMP to the USFWS and CDFG if a revision is found necessary.	1
NBVC NR In House		Comply with recent CNI draft guidance on INRMPs and continue to utilize the INRMP Metrics Builder to assess implementation.	1
NBVC NR In House		Provide funding and support for research and other studies to further SNI natural resources management.	1
NBVC NR In House		Provide documentation to secure appropriate levels of NBVC NR In House funding to support natural resource management programs.	1
NBVC NR In House		Develop prioritized lists of proposed management efforts to guide development of funding proposals.	1
NBVC NR In House		Develop plans and documentation to secure external funding and continue to request external funding from other state and federal agencies.	1
NBVC NR In House		Support scientific, academic, and volunteer efforts to initiate or supplement natural resources management programs.	1
NBVC NR In House		Identify and ensure departments prioritize and allocate funding to support compliance requirements.	1
NBVC NR In House		Seek awards for natural resource work conducted at SNI.	1
NBVC NR In House		Continue to ensure effective communication, adaptive oversight, and policy leadership through the USDON Natural Resources Strategic Plan.	1

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Appendix D: Benefits for Endangered Species

The ESA was revised via the NDAA of 2004 (PL 108-136) to recognize INRMP conservation measures and species benefit that could obviate the need for critical habitat designation on Navy lands.

Section 4(a)(3) of the revised ESA states that: "The Secretary [of the Interior] shall not designate as critical habitat any lands or other geographical areas owned or controlled by USDOD, or designated for its use, that are subject to an integrated natural resources management plan prepared under section 101 of the SAIA (16 USC 670a), if the Secretary determines in writing that such plan provides a benefit to the species for which critical habitat is proposed for designation."

All Navy installations with federally listed threatened or endangered species, proposed federally listed threatened or endangered species, candidate species, or unoccupied habitat for a listed species where critical habitat may be designated, must structure the INRMP to avoid the designation of critical habitat. The INRMP may obviate the need for critical habitat if it specifically addresses both the benefit provided to the listed species and the provisions made for the long-term conservation of the species. The species benefit must be clearly identifiable in the document and should be referenced as a specific topic in the INRMP table of contents.

The USFWS uses a three-point criteria test, to determine if an INRMP provides a benefit to the species. An installation is strongly encouraged to use these USFWS criteria, listed below, when structuring its INRMP to avoid the need for critical habitat designation:

1. The plan provides a conservation benefit to the species. The cumulative benefits of the management activities identified in a management plan, for the length of the plan, must maintain or provide for an increase in a species' population, or the enhancement or restoration of its habitat within the area covered by the plan [i.e. those areas deemed essential to the conservation of the species]. A conservation benefit may result from reducing fragmentation of habitat, maintaining or increasing populations, insuring against catastrophic events, enhancing and restoring habitats, buffering protected areas, or testing and implementing new conservation strategies.

2. The plan provides certainty that the management plan will be implemented. Persons charged with plan implementation are capable of accomplishing the objectives of the management plan and have adequate funding for the management plan. They have the authority to implement the plan and have obtained all the necessary authorizations or approvals. An implementation schedule, including completion dates, for the conservation effort is provided in the plan.

3. The plan provides certainty that the conservation effort will be effective. The following criteria will be considered when determining the effectiveness of the conservation effort. The plan includes (1) biological goals (broad guiding principles for the program) and objectives (measurable targets for achieving the goals); (2) quantifiable, scientifically valid parameters that will demonstrate achievement of objectives and standards for these parameters by which progress will be measured are identified; (3) provisions for monitoring and, where appropriate, adaptive management;

(4) provisions for reporting progress on implementation (based on compliance with the implementation schedule) and effectiveness (based on evaluation of quantifiable parameters) of the conservation effort are provided; and (5) a duration sufficient to implement the plan and achieve the benefits of its goals and objectives.

The federally endangered black abalone, federally endangered white abalone, federally threatened island night lizard, federally threatened western snowy plover, and federally threatened Guadalupe fur seal need to be addressed.

San Nicolas Island Ecosystem

1. The plan provides a conservation benefit to the federally listed species.

San Nicolas Island natural resources, including special status species, will be managed through an ecosystem management approach. Goals have been developed to guide the ecosystem management approach at SNI, these are discussed under the third criteria in this section concerning the San Nicolas Island ecosystem. The objectives and management strategies developed to support the SNI INRMP ecosystem management goals are included in Chapter 4: Natural Resource Management Objectives and Strategies, Chapter 5: Sustainability and Compatible Use at San Nicolas Island, and Chapter 6: Implementation Strategy. The INRMP topics that are addressed in Chapters 4,5, and 6 are respectively identified in Table D-1, Table D-2, and Table D-3. The INRMP topics identified in the tables below are all supported by an objective and management strategy. INRMP topics that did not have an explicit objective and management strategy are not included in these tables.

Table D-1. Chapter 4 Natural Resource Management Objectives and Strategies Topics .

INRMP Section	INRMP Natural Resource Management Topics
4.1	Ecosystem Approach
4.2.1	Water Resources and Water Quality
4.2.2	Soil Conservation
4.2.3	Wildland Fire Management
4.3.1	Terrestrial Vegetation Communities
4.3.1.1	Coastal Scrub
4.3.1.2	Vernal Pools
4.3.1.3	Riparian Vegetation
4.3.1.4	Grasslands
4.3.1.5	Coastal Marsh
4.3.1.6	Beach and Dune - Stabilized Dunes
4.3.1.6	Beach and Dune - Drifting Dunes
4.3.2	Jurisdictional Waters - Wetlands
4.3.3	Coastal and Marine Habitats
4.3.3.1	Sandy Beaches
4.3.3.2	Rocky Intertidal
4.3.3.3	Nearshore Waters - Unvegetated Soft Bottom
4.3.3.3	Nearshore Waters - Vegetated Soft Bottom
4.3.3.3	Nearshore Waters - Rocky Reefs and Kelp Forests
4.3.3.4	Offshore Rocks
4.4.1	Terrestrial Invertebrates
4.4.2	Reptiles and Amphibians
4.4.3	Birds - Migratory Birds
4.4.3	Birds - Resident Birds
4.4.4	Terrestrial Mammals
4.4.5	Marine Macroalgae and Plants
4.4.6	Marine Invertebrates
4.4.7	Marine Fishes
4.4.8	Marine Mammals
4.5.1	federally Listed Species and Critical Habitat
4.5.1.1	Terrestrial Reptiles - Island Night Lizard
4.5.1.2	Birds - Western Snowy Plover
4.5.1.3	Marine Invertebrates - Black Abalone
4.5.1.4	Marine Invertebrates - White Abalone
4.5.1.5	Marine Mammals - Guadalupe Fur Seal
4.5.2	Management of Other Special Status Species
4.5.2.1	Special Status Plants
4.5.2.2	Special Status Terrestrial Invertebrate Species

Table D-1. Chapter 4 Natural Resource Management Objectives and Strategies Topics (Continued).

INRMP Section	INRMP Natural Resource Management Topics
4.5.2.3	Birds - Xantus's Murrelet
4.5.2.4	Birds - Ashy Storm Petrel
4.5.2.5	Terrestrial Mammals - San Nicolas Island Fox
4.5.2.6	Terrestrial Mammals - San Nicolas Island Deer Mouse
4.5.3	Marine Mammals - Southern Sea Otter
4.6.1	Terrestrial Invasive Species - Prevention
4.6.1	Terrestrial Invasive Species - Early Detection and Rapid Response
4.6.1	Terrestrial Invasive Species - Control and Management
4.6.1	Terrestrial Invasive Species - Restoration of Habitats
4.6.1	Terrestrial Invasive Species - Organizational Collaboration
4.6.2	Aquatic Invasive Species
4.7.1	Bird/Aircraft Strike Hazard Program
4.7.2	Pest/Predator Control - General Pest Species
4.7.2	Pest/Predator Control - Rodents
4.8	Data Integration, Access, and Reporting

Table D-2. Chapter 5 Sustainability and Compatible Use Topics.

INRMP Section	INRMP Natural Resource Management Topics
5.1.1	Integrated Military Mission and Sustainable Land Use Decisions
5.1.2	Adapting to Effects of Climate Change and Regional Growth
5.1.3	Sustainability in the Built Environment
5.2	Construction and Facility Maintenance
5.2.1	Road Maintenance
5.3	Communication Towers, Power Lines, and Wind Farms
5.4	Beneficial Partnerships and Collaborative Planning
5.5	Public Access and Outreach
5.6	Public Outreach
5.7.1	Consistency with Integrated Cultural Resource Management Plan
5.8	NEPA Compliance
5.9	Stormwater Management
5.10	Remediation of Contaminated Sediments
5.11	Oil Spill or Hazardous Substance Prevention and Clean Up
5.12	Cumulative Effects
5.12.1	Shoreline Construction
5.13.1	Project and Mitigation Planning
5.14	Landscaping and Grounds Maintenance
5.16	Outdoor Recreation
5.17	Natural Resources Law Enforcement

Table D-3. Chapter 6 Implementation Strategy Topics.

INRMP Section	INRMP Natural Resource Management Topics
6.0	Implementation Strategy
6.1	General Considerations
6.1.4	Personnel Training
6.2	Adaptive Management
6.2.1	Annual Update, Review, and Metrics
6.3	Budget Considerations
6.3.2	External Assistance
6.3.2.2	Planned External Support
6.4	Funding Sources
6.5	INRMP Implementation Summary and Schedule

The INRMP topics included in Chapters 4 through 6 implemented together in an integrated approach, provide a direct cumulative benefit to the SNI ecosystem, associated terrestrial and marine habitats, to terrestrial and marine flora, resident and migratory wildlife populations, and to special status species.

1. The plan provides certainty that the management plan will be implemented.

The following is an excerpt from *Section 1.2: Authority* that describes the authority for NBVC resource managers to implement the SNI INRMP and to ensure that the INRMP will be implemented:

"The Sikes Act directs the USDOD to take the appropriate management actions necessary to protect and enhance the land and water resources on all installations under its control. USDOD Directive (DIR) 4700.4, Natural Resources Management Program and USDODDIR 4715.3, Environmental Conservation Program, have been implemented to establish fundamental land management policies and procedures for all military lands to preserve the military mission, but at the same time protect the natural resources. Naval Facilities Engineering Command (NAVFAC) MO-100.1 (Maintenance Operating Manual, Natural Resources Land Management) provides basic technical guidance for land management practices of all USDOD land and water resources. Also under NAVFAC is the Natural Resources Management Procedure Manual (NAVFAC P-73) which also instructs on how to develop an INRMP and on its content. Naval Operations Instruction (OPNAVINST) 5090.1C, Environmental and Natural Resources Program Manual, October 2007 Chapter 24 Natural Resources Program, further establishes program responsibilities and standards for complying with resource protection laws, regulations and Executive Orders (EOs) to conserve and manage natural resources on Navy installations in the U.S. and its territories and possessions. Finally, the U.S Navy Chief of Naval Operations (CNO) INRMP Guidance for Navy Installations, How to Prepare, Implement, and Revise INRMPs, April 2006 supplies guidelines on the process and procedure for developing an INRMP.

Federal and state legal requirements that are the primary drivers for natural resources management are listed in Appendix B (USC, Public Laws [PL], EOs, and Code of Federal Regulations [CFR]).

Organization of this INRMP is consistent with the 2006 USDOD Template for INRMPs (USDOD 2006). Since Navy guidance (both CNO Guidance of April 2006, and OPNAVINST 5090.1C) is more comprehensive than that identified in the USDOD Template, the outline has been re-worked so that additional material is added in the document to ensure compliance with all guidelines (USDON 2006, 2007; USDOD 2006)."

Furthermore, persons charged with plan implementation are capable of accomplishing the objectives of the management plan and have adequate funding for the management plan. They have the authority to implement the plan and have obtained all the necessary authorizations or approvals. The following is an excerpt from *Section 6.1.3: Staffing* that identifies this in the Plan:

"The SAIA specifically requires that there be "sufficient numbers of professionally trained natural resources management and natural resources enforcement personnel to be available and assigned responsibility" to implement an INRMP.

The ED is responsible for identifying personnel requirements to accomplish INRMP goals and objectives. The ED is also responsible for providing input into this process by allocating existing budgetary and personnel resources and then identifying staffing needs based on any additional current and future projects. Personnel assigned to natural resources management are the core staff responsible for implementing the INRMP. These personnel ensure that a consistent conservation program is carried out by using strategies outlined in this plan to support the Navy mission and achieve INRMP goals and objectives.

The following staffing is required to implement this INRMP at SNI:

- Terrestrial Ecologist
- Marine Ecologist
- Biological Technician
- Environmental Protection Specialist (NEPA)."

The following is an excerpt from *Section 6.1.4: Personnel Training* that describes additional measures to ensure that staff will receive training and will ensure that the INRMP will be implemented:

"Properly trained personnel are required to achieve objectives and guidelines of this INRMP. Environmental staff members entrusted with this work must have a thorough knowledge and understanding of biology and natural resources, as well as administrative duties such as project management, reporting, and contracting. Periodically, additional training is needed to keep personnel updated on the current practices and advances in knowledge of these topics. This training may be obtained from a variety of sources, including universities, regulatory agencies, professional societies, and other Navy or military organizations. These training opportunities may be offered in the forms of structured courses or conferences, workshops, and symposia. SNI will evaluate the following annual workshops or professional conferences for attendance depending on funding available for travel and training:

- National Military Fish and Wildlife Association annual workshop;
- North American Natural Resources Conference; and
- PIF national, regional, and state meetings (generally in conjunction with other listed meetings).

Other conferences/workshops will be evaluated for their usefulness, and decisions will be made based on appropriateness to ongoing projects and funding availability. Projects, which are especially useful, are GPS, GIS, and endangered species training.

The Wildlife Society, Society for Ecological Restoration, the Society for Conservation Biology, and National Military Fish and Wildlife Association are among the professional societies applicable to meeting the needs of SNI's natural resources managers. Membership in these societies is encouraged. The Wildlife Society has some of the best scientific publications in the profession, and literature review is a necessary commitment to maintain standards . Attending meetings of these societies provides excellent opportunities to communicate with fellow professionals as well as maintain professional standards."

Objective and Strategies for Personnel Training

Objective: Continue to improve the success of natural resources management activities through professional development and information exchange.

I. Maintain staff knowledge of management strategies through training and participation in or hosting workshops, research presentations, and other activities of regional, interstate, and international professional natural resources research and conservation programs.

II. Share information with natural resources experts to ensure maximum benefits of adaptive management and research efforts.

The following is an excerpt from *Section 6.5 INRMP Implementation Summary and Schedule* that summarizes the objectives and strategies for INRMP implementation and summarizes the INRMP and its schedule:

"The objectives and strategies that support INRMP implementation are identified in this section. Following these objectives and management strategies are Tables 6-1 , 6-2, 6-3, and 6-4 that summarize various aspects of the implementation of this INRMP.

The purpose of Table D-7 is to summarize all the projects or activities that NBVC intends to implement over the duration of the INRMP time frame. Table D-7 is organized according to INRMP management topic. Management strategies presented in Chapter 4, 5, and 6 identify the means by which NBVC intends to achieve desired future conditions. Management actions, such as EPR projects, are specific projects or activities that provide NBVC a mechanism to strive towards achieving those desired future conditions. Individual EPR projects may address multiple management strategies encompassing various INRMP management topics. In order to reduce redundancy, management strategies are incorporated by reference in the "INRMP Management Strategy" column of the table. Management topics that do not appear as a heading in the table are identified in the "INRMP Management Strategy" column numerically and referenced to an EPR project that may encompass several topic

- **For more information on the implementation schedule from 2011-2030 refer to Appendix C.**

areas. Also, management strategies that pertain to special status species have their own sections rather than including special status species management strategies in the broader sections that pertain to wildlife populations. This Implementation Table parallels the structure of the INRMP as presented in Chapters 4, 5, and 6 and all INRMP management strategies presented in these Chapters are referenced in the "INRMP Management Strategy" column in this table.

Table D-4 identifies the various EPR project codes and descriptions that are referenced in the "EPR Project Code" column of Table D-7; these include the EPR number or placeholder for future EPR projects (e.g., 63126-EPR-Dune) if appropriate. Table D-5 identifies the applicable funding sources for each project; for more information on funding sources refer to section 6.5 Funding Sources. Table D-6 identifies the applicable INRMP legal drivers, or compliance requirements, for all of the various INRMP management projects or activities. All projects listed in Table D-7 support compliance with OPNAVINST 5090.1C and USDODINST 4715.3, which causes all INRMP management projects to be categorized at a minimum of Budget Priority/Class Level 2.

Objectives and Strategies for INRMP Implementation

Objective: Provide the organizational capacity, communication, planning functions, staffing, budgeting, and innovative technology support to ensure compliance with environmental laws, stewardship of natural resources, and continued use of San Nicolas Island's lands by the Navy.

Objective: Ensure that all appropriate avenues and partnerships are investigated and sought for achieving the goals and objectives of this INRMP, for the best possible management and most efficient use of funds.

I. Seek a balanced, multiple-use natural resources program through professional management (*Real Estate Operations and Natural Resources Management Procedural Manual NAVFAC P-73 Volume II 1987*).

- *A.* Ensure environmental staff receive ongoing training and professional development through attendance at workshops, classes, training, and conferences.

II. Identify and ensure departments prioritize and allocate funding to support compliance requirements.

- *A.* Funds will be requested for tasks within the INRMP, with priority given to Class I, II, and III projects, in that order, based on guidance in USDODINST 4715.3 *Environmental Conservation Program.*
- *B.* "Must fund" conservation requirements are those projects and activities that are required to meet recurring natural and cultural resources conservation management requirements (Class 0) or current compliance (Class 1 and 2) needs. Navy "must fund" projects and actions include those required to:
  1. Meet with legislative directive, EOs, and any legal requirement supported by laws and regulations found, but not limited to:
     - *a.* Federally threatened and endangered species surveys.
     - *b.* Baseline wetland delineations.
     - *c.* Mapping of federally threatened and endangered species.
     - *d.* Mapping of critical habitat.
  2. Meet the USFWS special management criteria for threatened and endangered species management and avoidance of critical habitat designation on military bases.
  3. Integrally support mission readiness, training requirements, and land sustainability. Examples include:
     - *a.* Prevention of resource loss or degradation (e.g. soil loss, erosion control).
     - *b.* Baseline data collection and long-term trend monitoring efforts.
  4. Provide for qualified natural resources personnel.

C. Identify new funding sources from federal, state, local, and nonprofit organizations with an interest in achieving the goals and objectives of this INRMP in partnership with SNI. These often require cost-sharing with a non-federal organization. This funding opportunity should be sought for projects that are not Class 0 or 1 "must fund" items, tied directly to regulatory compliance. Examples are watershed management, habitat enhancement, or wetland restoration.

D. Support the mutual goals and objectives of this INRMP and the California Wildlife Action Plan (WAP), as well as a local Natural Community Conservation Plan (NCCP), through partnership funding.

E. Monitor websites that keep track of funding opportunities for environmental stewardship.

F. Apply for grants in partnership with local non-profits or other agencies.

III. Seek awards for natural resource work conducted at SNI.

IV. Continue to ensure effective communication, adaptive oversight and policy leadership through the USDON Natural Resources Strategic Plan.

Table D-4. INRMP EPR Project Codes and Descriptions.

EPR Project Code	Description
6923224086	Feral Cat Removal
69232XXX90	Invasive exotic plant eradication
63126XXX85	Island night lizard survey
63126XXX86	Brown pelican and seabird surveys
63126XXX87	Wetland delineation
63126XXX88	Pinniped monitoring
63126XXX89	Vegetation survey
63126XXX97	Terrestrial invertebrate management activities
63126B0067	Bat management activities
63126XXX93	Island fox management activities
63126B003	Endangered species management activities
69232B0094	Revision of SNI INRMP
63126EPRClimateChange	Climate change vulnerability assessment
63126EPRErosion	Erosion control plan
63126EPRFire	Wildland fire management plan
63126EPRDune	Dune drift management plan
63126EPRMarine	Marine resource management activities
63126EPRBird	Migratory and resident bird management activities
63126EPRBlackAb	Black abalone management activities
63126EPRRare Plant	Rare plant management activities
63126EPRMarine Invasives	Marine aquatic invasive species management activities
63126EPRLandscape	Landscaping and grounds maintenance plan and instruction
63126EPREducation	Environmental education activities

Table D-5. INRMP Project Funding Sources.

Funding Sources	Description
NBVC NR In House	NBVC natural resource program funding
NBVC Other Navy In House	NBVC Public Works or other NBVC Department or Division funding
O&MN	Operations and Maintenance Navy funding
Navy Tenant	NBVC Naval tenant funding
Naval Air Operations	Naval Air Operations funding
Research Institutions	Research institution, non-governmental organization, or volunteer funding
Project Proponent	Project proponent funding

Table D-6. INRMP Implementation Table Management Project or Activity Legal Drivers.

Acronym	Description
ASBS	Area of Special Biological Significance Requirement
BEPA	Bald Eagle Protection Act
BLM MOU No CA-939-08-02	BLM and U.S Navy Memorandum of Understanding for the California Coastal National Monument
BO 1-8-01-F-14	Biological Opinion for Activities on San Nicolas Island, California
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
EFH	Essential Fish Habitat
EO 11988	Floodplain Management
EO 11514	Protection and Enhancement of Environmental Quality
EO 11990	Protection of Wetlands
EO 11991	Protection and Enhancement of Environmental Quality
EO 12342	Environmental Safeguard for Animal Damage Control on Federal Lands
EO 12962	Recreational Fisheries
EO 13101	Greening the Government Through Waste Prevention, Recycling, and Federal Acquisition
EO 13112	Invasive Species
EO 13123	Greening the Government Through Efficient Energy Management
EO 13148	Greening the Government Through Leadership in Environmental Management
EO 13158	Marine Protected Areas
EO 13423	Strengthening Federal Environmental, Energy, and Transportation Management
ESA	Endangered Species Act
FNWA	Federal Noxious Weed Act
LRPPA	Legacy Resource Protection Program Act
MBTA	Migratory Bird Treaty Act
MMPA	Marine Mammal Protection Act
NEPA	National Environmental Policy Act
OPNAVINST 5090.1C	Environmental Protection and Natural Resources Manual
OPPA	Oil Pollution Prevention Act
RCRA-HSWA	Resource Conservation and Recovery Act - Hazardous and Solid Waste Amendments
SCA	Soil Conservation Act
SAIA	Sikes Act Improvement Act
USDODINST 4715.3	US DOD Environmental Conservation Program
USDODINST 6055.06	US DOD Fire and Emergency Services Program
WPFPA	Watershed Protection and Flood Prevention Act

Table D-7. Integrated Natural Resources Management Plan Implementation Summary, including the assignment of priorities based on legal driver behind each project .

INRMP Management Strategy	Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level	Legal Driver	Implementation		Natural Resources Metrics Builder	Desired Future Condition
						Frequency	Year		
4.0			*Natural Resource Management Objectives and Strategies*						
4.1			*Ecosystem Approach*						
4.1 (VI)	O&MN	69232B0094	Integrated Natural Resources Management Plan revisions and associated Environmental Assessment to incorporate current resources and management knowledge.	1	SAIA	Annual	2011 - 2030	1. INRMP Project Implementation 2. Listed Species and Critical Habitat 3. Partnership Effectiveness 4. Fish and Wildlife Management and Public Use 5. Team Adequacy 6. Ecosystem Integrity 7. INRMP Impact on Installation Mission	Maintain populations of special status species and species diversity.
4.1 (I, II, III)	NBVC NR In House		Apply sustainability principles to the management of habitats, species, and ecological functions on SNI by identifying resource specific best practices similar to Sustainable Sites Initiatives (SSI) approaches.	1	SAIA, NEPA, CWA, EO 13148, EO 13101, EO 11514, EO 11991	Annual	2011 - 2030	2. Listed Species and Critical Habitat 6. Ecosystem Integrity	Maintain populations of special status species and species diversity.
4.2			*Managing the Physical and Chemical Environment*						
4.2.1			*Water Resources/Water Quality*						
4.2.1. (I, II, III)	NBVC Other Navy In House		Update as needed and implement Storm Water Pollution Prevention Plan (SWPPP).	1	SAIA, CWA, CZMA, ASBS	Five Years	2015, 2020, 2025, 2030	6. Ecosystem Integrity	Capability of access to natural groundwater supply and monitoring its condition.
4.2.2			*Soil Conservation*						
4.2.2 (I, II, III, V) 4.3.1 (VI) 4.3.1.1 (IV) 4.5.2.1 (IV)	O&MN	63126EPR Erosion	Develop and implement an erosion control plan.	1	SAIA, SCA, CWA, CZMA	Five Years	2015, 2020, 2025, 2030	6. Ecosystem Integrity	Develop program to evaluate soil conditions in order to understand conservation needs.
4.2.3			*Wildland Fire Management*						
4.2.3 (I, II, III, IV, V) 4.3.1.4 (I)	O&MN	63126EPRFire	Develop and implement a Wildland Fire Management Plan (WFMP) for SNI.	1	SAIA, USDODINST 6055.6	Five Years	2015, 2020, 2025, 2030	6. Ecosystem Integrity	Develop program to manage wildland fire.
4.3			*Management of Habitats and Plant Communities*						
4.3.1			*Terrestrial Vegetation Communities*						
4.2.2 (IV, VI, VII, VIII) 4.3.1 (I, V, VII, IX, X) 4.3.1.1 (I, II, III, V) 4.3.1.3 (I) 4.3.1.5 (I)	O&MN	63126XXX89	Inventory plant species diversity, abundance, and density to develop priorities for monitoring that establishes ranking system, sensitive species habitat, and creates criteria for restoration work while define the extent, nature, and value of vegetation resources of SNI.	1	SAIA, ESA, LRPPA	Five Years	2015, 2020, 2025, 2030	2. Listed Species and Critical Habitat 6. Ecosystem Integrity	Implement standard protocol and quantify existing habitat areas for management consideration.

Table D-7. Integrated Natural Resources Management Plan Implementation Summary, including the assignment of priorities based on legal driver behind each project (Continued).

INRMP Management Strategy	Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level	Legal Driver	Implementation		Natural Resources Metrics Builder	Desired Future Condition
						Frequency	Year		
4.3.1.6			*Beach and Dune - Stabilized and Drifting Dunes*						
4.3.1.6 (II, III)	O&MN	63126EPR Dune	Develop and implement a dune drift management plan to determine effective alternatives to manage dune drift impact to roads, operations, and natural resources.	1	SAIA, CZMA, LRPPA	Five Years	2015, 2020, 2025, 2030	6. Ecosystem Integrity	Develop program to manage drifting dunes.
4.3.2			*Jurisdictional Waters - Wetlands*						
4.3.2 (I)	O&MN	63126XXX87	Maintain a current inventory of wetlands to support planning and management efforts to achieve no net loss of wetlands.	1	SAIA, CWA, CZMA, EO 11990	Five Years	2015, 2020, 2025, 2030	6. Ecosystem Integrity	No net loss of wetlands.
4.3.2 (II)	NBVC NR In House		Protect the natural ecological integrity, structure, and functional values of the wetlands and floodplains on SNI.	1	SAIA, CWA, CZMA, LRPPA, WPFPA, EO 11990	Annual	2011 - 2030	6. Ecosystem Integrity	No net loss of wetlands.
4.3.3			*Coastal and Marine Habitats and Communities*						
4.3.3.1			*Sandy Beaches*						
4.3.3.1 (I)	O&MN	63126EPR Marine	Collect baseline information and establish monitoring protocols for sandy beach communities to support management to maintain habitat integrity.	1	SAIA, CZMA, ESA, CWA, ASBS	Two Years	2012, 2014, 2016, 2018, 2020, 2022, 2024, 2026, 2028, 2030	6. Ecosystem Integrity	Establish baseline information on the status and condition of key species.
4.3.3.2			*Rocky Intertidal Community*						
4.3.3.2 (I, II)	O&MN	63126EPR Marine	Continue rocky intertidal surveys and encourage additional monitoring at SNI consistent with monitoring performed at the other Channel Islands and throughout California, to establish regional trends and understand site specific change.	1	SAIA, CZMA, ESA, CWA, ASBS	Two Years	2012, 2014, 2016, 2018, 2020, 2022, 2024, 2026, 2028, 2030	6. Ecosystem Integrity	Establish baseline information on the status and condition of key species.
4.3.3.3 *4.3.3.4*			*Nearshore Waters - Unvegetated Soft Bottom and Vegetated Soft Bottom*						
4.3.3.3 (I) 4.3.3.4 (I)	O&MN	63126EPR Marine	Develop and implement unvegetated and vegetated soft bottom monitoring protocols at SNI to determine resource status and extent of submerged aquatic vegetation (eelgrass).	1	SAIA, CZMA, ESA, CWA, ASBS	Two Years	2012, 2014, 2016, 2018, 2020, 2022, 2024, 2026, 2028, 2030	6. Ecosystem Integrity	Establish baseline information on the status and condition of key species.
4.3.3.5			*Nearshore Waters - Rocky Reefs and Kelp Forests*						
4.3.3.5 (I)	O&MN	63126EPR Marine	Support establishment of kelp forest ecosystem monitoring locations around SNI while encouraging state and federal agencies and academic researchers to investigate important community related questions involving recruitment, disturbance, and species diversity that help to access regional trends.	1	SAIA, CZMA, ESA, CWA, EFH, ASBS	Two Years	2012, 2014, 2016, 2018, 2020, 2022, 2024, 2026, 2028, 2030	6. Ecosystem Integrity	Establish baseline information on the status and condition of key species.

Table D-7. Integrated Natural Resources Management Plan Implementation Summary, including the assignment of priorities based on legal driver behind each project (Continued).

INRMP Management Strategy	Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level	Legal Driver	Implementation		Natural Resources Metrics Builder	Desired Future Condition
						Frequency	Year		
4.3.3.6			*Offshore Rocks*						
4.3.3 (III, IV) 4.3.3.6 (I)	NBVC NR In House		Develop management strategies through partnerships with the BLM to support the management of the Begg Rock State Marine Reserve and of the offshore rocks near SNI and Begg Rock that are designated as part of the CCNM.	1	SAIA, CZMA, BLM MOU No. CA-939-08-02	Two Years	2012, 2014, 2016, 2018, 2020, 2022, 2024, 2026, 2028, 2030	3. Partnership Effectiveness	Establish baseline information on the status and condition of key species.
4.4			*Fish and Wildlife Management*						
4.4.1			*Terrestial Invertebrates (excluding special status species)*						
4.4.1 (I)	O&MN	63126XXX97	Collect baseline information on the invertebrate community of SNI, with particular emphasis on endemics and pollinators.	1	SAIA, ESA	Three Years	2013, 2016, 2019, 2022, 2025, 2028	2. Listed Species and Critical Habitat 6. Ecosystem Integrity	Collect baseline information on the status and condition of key species.
4.4.2			*Reptiles and Amphibians (excluding special status species)*						
4.4.2 (I, II, III)	O&MN	63126XXX85	Conduct regular monitoring of reptiles and amphibians in addition to island night lizard monitoring and develop accurate GIS data layers for known populations and conserve habitat associations to avoid sensitive areas and minimize potential impacts.	1	SAIA, ESA	Annual	2011 - 2030	2. Listed Species and Critical Habitat 6. Ecosystem Integrity	Maintain populations of special status species and species diversity.
4.4.3			*Birds - Migratory and Resident Birds (excluding special status species)*						
4.4.3 (I, II, V, VI, VII, VIII, X)	O&MN	63126EPR Bird	Migratory and resident bird inventory and restoration management activities to conserve bird population and develop and maintain information on status and trend of population and habitats.	1	SAIA, ESA, MBTA, BEPA	Annual	2011 - 2030	3. Partnership Effectiveness 6. Ecosystem Integrity	Maintain populations of special status species and species diversity.
4.4.3 (IX)	O&MN	63126XXX86	Monitor resident seabird populations and breeding colonies to track the sustainability of populations and their habitat.	1	SAIA, ESA, MBTA	Annual	2011 - 2030	6. Ecosystem Integrity	Maintain populations of special status species and species diversity.
4.4.3 (III)	NBVC NR In House		Implement bird conservation principles, measures, and practices through avoidance and minimization measures to protect resident and migratory bird populations.	1	SAIA, ESA, MBTA, BEPA	Annual	2011 - 2030	6. Ecosystem Integrity	Maintain populations of special status species and species diversity.
4.4.4			*Terrestrial Mammals (excluding special status species)*						
4.4.4 (I, II)	Research Institutions		Support small mammal monitoring programs at SNI to adapt management strategies based on current population status.	1	SAIA, ESA	Three Years	2013, 2016, 2019, 2022, 2025, 2028	6. Ecosystem Integrity	Maintain populations of special status species and species diversity
4.4.4 (III)	O&MN	63126B0067	Inventory and monitor bat populations on SNI to adapt management strategies based on current population status.	1	SAIA	Annual	2011 - 2030	6. Ecosystem Integrity	Maintain populations of special status species and species diversity.
4.4.5			*Marine Macroalgae and Plants*						
4.4.5 (I, II)	O&MN	63126EPR Marine	Collect community level marine macroalgae baseline information surveys to support focused management efforts and identify indicator species. Survey subtidal and intertidal areas near high use locations (pier and barge landing areas) for the introduction of non-native invasive species.	1	SAIA, CZMA, ASBS, EO 13112	Two Years	2012, 2014, 2016, 2018, 2020, 2022, 2024, 2026, 2028, 2030	6. Ecosystem Integrity	Establish baseline information on the status and condition of key species.
4.4.6			*Marine Invertebrates (excluding special status species)*						
4.4.6 (I)	O&MN	63126EPR Marine	Develop and implement a marine resource stewardship plan.	1	SAIA, ESA, CZMA	Five Years	2015, 2020, 2025, 2030	2. Listed Species and Critical Habitat 6. Ecosystem Integrity	Establish baseline information on the status and condition of key species

Table D-7. Integrated Natural Resources Management Plan Implementation Summary, including the assignment of priorities based on legal driver behind each project (Continued).

INRMP Management Strategy	Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level	Legal Driver	Implementation		Natural Resources Metrics Builder	Desired Future Condition
						Frequency	Year		
4.4.7			*Fishes*						
4.4.7 (I)	O&MN	63126EPR Marine	Develop a fish monitoring program and management plan to conserve fish population abundance and habitat diversity.	1	SAIA, CZMA, EFH	Three Years	2013, 2016, 2019, 2022, 2025, 2028	6. Ecosystem Integrity	Establish baseline information on the status and condition of key species
4.4.8			*Marine Mammals (excluding special status species)*						
4.4.8 (I, II, III)	O&MN	63126XXX88	Monitor island-wide pinniped breeding and haul out sites and periodic evaluation of current adaptive management practices.	1	SAIA, ESA, CZMA, MMPA	Annual	2011 - 2030	2. Listed Species and Critical Habitat 6. Ecosystem Integrity	Maintain populations of special status species and species diversity
4.5			*Special Status Species Protection*						
4.5.1			*Federally Listed Species and Critical Habitat*						
4.5.1 (I, III)	Navy Tenant Funded	63126B003	Ensure that land use plans and activities in or near threatened or endangered species habitats are accomplished in accordance with the ESA in accordance with current Biological Opinions and with ESA Section 7 Consultation Handbook (USFWS/NMFS March 1998).	1	SAIA, ESA, BO 1-8-01-F-14	Annual	2011 - 2030	2. Listed Species and Critical Habitat	Maintain populations of special status species and facilitate the eventual delisting of the species.
4.5.1 (II)	O&MN	63126B003	Per USFWS Biological Opinion (2001) provide the USFWS an annual report containing the number of island night lizards, California Brown Pelicans, and Western Snowy Plover killed or injured by Navy activities, and a summary of Navy activities and their effects on listed species. in accordance with the Reporting Requirements in the BO (USFWS 2001).	1	SAIA, ESA, BO 1-8-01-F-14	Annual	2011 - 2030	2. Listed Species and Critical Habitat	Maintain populations of special status species and facilitate the eventual delisting of the species.
4.5.1.1			*Island Night Lizard (Federally Threatened)*						
4.5.1.1 (I, II, III, IV, VI)	O&MN	63126XXX85	Support recovery plan efforts to establish stable island night lizard populations and eventual delisting by conducting site specific surveys prior to disturbance activities, implementing avoidance and minimization measures, and conducting studies to investigate the effectiveness of island night lizard management strategies with respect to impacts from alligator lizards and the relocation island night lizards.	1	SAIA, ESA, BO 1-8-01-F-14	Annual	2011 - 2030	2. Listed Species and Critical Habitat	Maintain populations of special status species and facilitate the eventual delisting of the species.
4.5.1.2			*Western Snowy Plover (Federally Threatened)*						
4.5.1.2 (I)	Navy Tenant Funded	63126B003	Support recovery plan efforts to establish stable western snowy plover populations and eventual delisting by closing nesting areas to recreational activity during the March 1 - September 15 breeding season and by removing unnecessary structures in nesting areas.	1	SAIA, ESA, BO 1-8-01-F-14	Annual	2011 - 2030	2. Listed Species and Critical Habitat	Maintain populations of special status species and facilitate the eventual delisting of the species

Table D-7. Integrated Natural Resources Management Plan Implementation Summary, including the assignment of priorities based on legal driver behind each project (Continued).

INRMP Management Strategy	Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level	Legal Driver	Implementation		Natural Resources Metrics Builder	Desired Future Condition
						Frequency	Year		
4.3.3 (II) 4.5.1.2 (II, III, VI)	Navy Tenant Funded	63126B003	Support recovery plan efforts to establish stable western snowy plover populations and eventual delisting by monitoring the effects of Navy activities on snowy plovers through conducting island-wide snowy plover censuses twice annually, once during the breeding season and once during the winter season, and through monitoring snowy plover nests during missile or target launches, general operations, and other activities that may disturb nesting behaviors.	1	SAIA, ESA, BO 1-8-01-F-14	Annual	2011 - 2030	2. Listed Species and Critical Habitat	Maintain populations of special status species and facilitate the eventual delisting of the species.
4.5.1.3			*Black Abalone (Federally Endangered)*						
4.3.3 (I) 4.5.1.3 (I, II, VII)	O&MN	63126EPR BlackAb	Support recovery plan efforts to establish stable black abalone populations through continuing to conduct presence and absence surveys and through developing and implementing annual abalone monitoring protocols.	1	SAIA, ESA, ASBS	Annual	2011 - 2030	2. Listed Species and Critical Habitat	Maintain populations of special status species and facilitate the eventual delisting of the species
4.5.1.3 (IV, V)	O&MN	63126EPR BlackAb	Continue to support appropriate closures at SNI and continue to review all military activities to ensure that they are in compliance with ESA and to avoid or minimize impacts to black abalone.	1	SAIA, ESA, ASBS	Annual	2011 - 2030	2. Listed Species and Critical Habitat	Maintain populations of special status species and facilitate the eventual delisting of the species.
4.5.1.4			*White Abalone (Federally Endangered)*						
4.5.1.4 (I, II, III)	O&MN	63126EPR Marine	Support recovery plan efforts to establish stable white abalone populations by facilitating efforts to identify white abalone habitat and determine densities of individuals around SNI.	1	SAIA, ESA, ASBS	Annual	2011 - 2030	2. Listed Species and Critical Habitat	Establish baseline information on the status and condition of key species
4.5.1.5			*Guadalupe Fur Seal (Federally Threatened)*						
4.5.1.5 (I, II)	NBVC NR In House / Research Institutions		Support on-going and new research on distribution and ecology of the Guadalupe fur seal. Encourage academic institutions to collect resource data. Record all sightings of Guadalupe fur seals and develop a database to track numbers of individuals, time of year, and location.	1	SAIA, MMPA, ESA	Annual	2011 - 2030	2. Listed Species and Critical Habitat	Establish baseline information on the status and condition of key species
4.5.2			*Management of Other Special Status Species*						
4.5.2 (I, II)	NBVC NR In House		Provide for the recovery, enhancement, and protection of species warranting Navy stewardship, as a proactive strategy to prevent federal listings and continue to resolve baseline biological data gaps.	1	SAIA, ESA	Annual	2011 - 2030	2. Listed Species and Critical Habitat	Establish baseline information on the status and condition of key species.
4.5.2.1			*Special Status Plants (State Endangered, State Threatened, State Rare, and CNPS Rare, Threatened, and Endangered)*						
4.5.2.1 (I, II, III, V)	O&MN	63126EPR Rare Plant	Collect data on the habitat and reproductive requirements for sensitive endemic plants species for conservation and management efforts.	1	SAIA, ESA	Five Years	2015, 2020, 2025, 2030	2. Listed Species and Critical Habitat	Establish baseline information on the status and condition of key species.
4.5.2.2			*Special Status Terrestrial Invertebrates -* *SNI Coenonycha Beetle (CNDDB Extremely Endangered) and SNI Snails (Federal Species of Concern)*						
4.5.2.2 (I)	O&MN	63126XXX97	Collect baseline information on the special status native invertebrate species of SNI.	1	SAIA, ESA	Three Years	2013, 2016, 2019, 2022, 2025, 2028	2. Listed Species and Critical Habitat	Establish baseline information on the status and condition of key species.

Table D-7. Integrated Natural Resources Management Plan Implementation Summary, including the assignment of priorities based on legal driver behind each project (Continued).

INRMP Management Strategy	Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level	Legal Driver	Implementation		Natural Resources Metrics Builder	Desired Future Condition
						Frequency	Year		
4.5.2.3			*Xantus's Murrelet (ESA Candidate)*						
4.5.2.3 (I, II)	O&MN	63126EPR Bird	Provide for the recovery, enhancement, and protection of Xantus's murrelets, as a proactive strategy to prevent federal listings and continue to resolve baseline biological data gaps.	1	SAIA, ESA	Annual	2011 - 2030	2. Listed Species and Critical Habitat	Establish baseline information on the status and condition of key species.
4.5.2.4			*Ashy Storm Petrel (ESA Candidate)*						
4.5.2.4 (I, II)	O&MN	63126EPR Bird	Provide for the recovery, enhancement, and protection of ashy storm-petrels, as a proactive strategy to prevent federal listings and continue to resolve baseline biological data gaps.	1	SAIA, ESA	Annual	2011 - 2030	2. Listed Species and Critical Habitat	Establish baseline information on the status and condition of key species.
4.5.2.5			*San Nicolas Island Fox (State Threatened)*						
4.5.2.5 (I, II)	Navy Tenant Funded	63126XXX93	Maintain a viable population of the San Nicolas Island fox by reducing negative, human-caused impacts and remaining an active participant with other agencies regarding island fox issues.	1	SAIA, ESA	Annual	2011 - 2030	2. Listed Species and Critical Habitat	Establish baseline information on the status and condition of key species.
4.5.2.6			*San Nicolas Island Deer Mouse (State Sensitive Species)*						
4.5.2.6 (I, II)	Research Institutions		Determine the status of deer mouse populations and conserve and protect deer mouse habitat.	1	SAIA, ESA	Annual	2011 - 2030	2. Listed Species and Critical Habitat	Establish baseline information on the status and condition of key species.
4.5.2.7			*Southern Sea Otter (ESA Non-Essential Experimental Population)*						
4.5.2.7 (I, II)		63126EPR Marine	Support on-going and new research on distribution and ecology of the southern sea otter at SNI. Encourage academic institutions to facilitate resource data collection and record all sightings of southern sea otters at SNI and develop a database to track numbers of individuals, time of year, and location.	1	SAIA, MMPA, ESA	Annual	2011 - 2030	2. Listed Species and Critical Habitat	Establish baseline information on the status and condition of key species.
4.6			*Invasive Species*						
4.6.1			*Terrestrial Invasive Species*						
4.3.1 (II, III) 4.3.1.2(I) 4.3.1.3 (II) 4.3.1.4 (II) 4.3.1.6 (I) 4.5.2.1 (VI) 4.6.1 (V, VI, VII, XIV)	O&MN	69232XXX90	Update and implement the invasive non-native plant species management and eradication program to insure use of existing BMP's to reduce the introduction of invasive species, establish early detection and rapid response protocol, map and prioritize most problematic terrestrial invasive non-native species populations, and maintain consistency with long-term protection of native plant communities.	1	SAIA, ESA, FNWA, EO 13112	Annual	2011 - 2030	6. Ecosystem Integrity	Develop program to evaluate invasive non-native plant species management and eradication in order to understand conservation needs.
4.4.1 (III) 4.6.1 (I, III, VIII, IX, XIII, XVI) 4.7.2 (IV)	O&MN	6923224086	Develop and implement a biosecurity plan to ensure invasive terrestrial fauna and flora are not brought to SNI by providing prevention, early detection, rapid response, and education guidelines.	1	SAIA, ESA, EO 13112	Annual	2011 - 2030	6. Ecosystem Integrity	Enforce establish defined BMPs and biosecurity measures for invasive species.
4.6.1 (XV)	O&MN	6923224086	Assess and monitor the progress and success of the removal of feral cats to support the shorebird enhancement project.	1	SAIA, ESA, EO 13112	Annual	2011 - 2030	6. Ecosystem Integrity	Enforce invasive species plans to control and manage exotic invasive species invasions.

Table D-7. Integrated Natural Resources Management Plan Implementation Summary, including the assignment of priorities based on legal driver behind each project (Continued).

INRMP Management Strategy	Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level	Legal Driver	Implementation		Natural Resources Metrics Builder	Desired Future Condition
						Frequency	Year		
4.6.2			*Aquatic Invasive Species*						
4.6.2 (I, II, III) 4.4.5 (III)	O&MN	63126EPR Marine Invasives	Develop and implement a plan to prevent the introduction of invasive non-native marine and coastal species into SNI waters which includes a standardized monitoring system focused on early detection for high priority aquatic invasive species, rapid response protocol, and promotes when an invasive is detected. Promote cooperative interagency efforts to collect and analyze comprehensive monitoring data.	1	SAIA, EO 13112	Annual	2011 - 2030	6. Ecosystem Integrity	Enforce aquatic invasive species measures to control and manage exotic invasive species invasions.
4.7			*Prevention and Control of Wildlife Damage*						
4.7.1			*BASH Program*						
4.4.3 (IV) 4.7.1 (II, III)	Naval Air Operations		Survey and monitor avian species utilizing airfield and document bird strikes and carcasses adjacent to airfield.	1	SAIA, MBTA, EO 12342	Five Years	2015, 2020, 2025, 2030	2. Listed Species and Critical Habitat 6. Ecosystem Integrity 7. INRMP Impact on the Installation Mission	Establish baseline information on the status and condition of BASH species.
4.7.1 (I)	Naval Air Operations		Develop and implement a BASH Plan and conduct a Wildlife Hazard Assessment for SNI.	1	SAIA, MBTA, EO 12342	Five Years	2015, 2020, 2025, 2030	7. INRMP Impact on the Installation Mission	Implement BASH Plan.
4.7.2			*Pest / Predator Control*						
4.7.2 (I, II, III)	NBVC NR In House		Minimize the introduction of pest species to SNI. Develop a rodent control /removal plan and implement if introduced species are detected. Determine presence or absence of non-native rodents.	1	SAIA, EO 12342	Annual	2011 - 2030	6. Ecosystem Integrity	Establish baseline information on the status and condition of pest and predator species.
4.8			*Data Integration, Access, and Reporting*						
4.2.3 (VI), 4.5.1.2 (V), 4.5.1.3 (VI) 4.8 (I, II, III, IV) 5.2.1 (III) 5.13.1 (IX, X)	NBVC NR In House / Research Institutions		Set up a central clearinghouse for data, reports, and publications pertaining to the NBVC's EMS that addresses natural resources, that is accessible to staff, and that is managed by a designated data manager.	1	SAIA, EO 13101	Annual	2011 - 2030	1. INRMP Project Implementation	Develop a database for natural resource activities at SNI.
5.0			*Sustainability and Compatible Use at San Nicolas Island*						
5.1			*Sustainability of the Military Mission in the Natural Environment*						
5.1.1			*Integrated Military Mission and Sustainable Land Use Decisions*						
5.1.1 (I, II, III, IV, VI, VII, VIII, X)	NBVC NR In House		Maintain habitats using principles of ecosystem management and sustainability and continue to use NEPA documentation. Define benefit or impact to the military mission.	1	SAIA, NEPA, EO 13148, EO 11514, EO 11991, EO 11988, EO 13158, EO 11990	Annual	2011 - 2030	7. INRMP Impact on the Installation Mission	Effective natural resource conservation and stewardship while supporting the military mission.

Table D-7. Integrated Natural Resources Management Plan Implementation Summary, including the assignment of priorities based on legal driver behind each project (Continued).

INRMP Management Strategy	Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level	Legal Driver	Implementation		Natural Resources Metrics Builder	Desired Future Condition
						Frequency	Year		
5.1.2			*Adapting to Effects of Climate Change and Regional Growth*						
4.1 (IV) 5.1.2 (I, II, III, IV, V, VI, VII)	O&MN	63126EPR Climate Change	Control and reduce greenhouse gas emissions by improving governance, implementing the SNI Net Zero Energy Installation Plan, providing energy conservation education, and addressing impacts in NEPA documents.	1	SAIA, EO 13123, EO 13148, EO 13423	Annual	2011 - 2030	6. Ecosystem Integrity 7. INRMP Impact on the Installation Mission	Control and reduce greenhouse gas emissions.
5.1.3			*Sustainability in the Built Environment*						
5.1.3 (I)	NBVC NR In House / NBVC Other Navy In House / Project Proponent		Update and implement the SNI Net Zero Energy Installation Plan to reduce dependency on jet fuel and thereby reducing air and water quality impacts.	1	SAIA, EO 13123, EO 13148, EO 13423	Five Years	2015, 2020, 2025, 2030	6. Ecosystem Integrity	Development of an effective communication strategy.
4.1 (VII, VIII) 5.1.3 (II, III, IV, V, VII, VIII)	NBVC NR In House / Project Proponent		Promote training in sustainable design criteria for Navy staff and apply sustainability principles to the management of natural resources and the built environment by using metrics (indicators) of sustainability and by adopting LEED, LID, and Sustainable Sites Initiative approaches while continuing to use RSIP, master planning, site approval, and NEPA processes.	1	SAIA, EO 13123, EO 13148, EO 13101, EO 11514, EO 11991, EO 13423	Annual	2011 - 2030	6. Ecosystem Integrity 7. INRMP Impact on the Installation Mission	Implement LEED, LID, and Sustainable Site approaches at SNI.
5.1.3 (VI)	NBVC NR In House		Develop and implement a SAP at an organizational level.	1	SAIA	Five Years	2015, 2020, 2025, 2030	6. Ecosystem Integrity	Develop and implement a SAP.
5.2			*Construction and Facility Maintenance*						
4.3.1 (IV) 5.2 (I, II, III, IV)	NBVC NR In House		Establish protocols for emergency and regular repair of infrastructure so that human life, health and safety are given precedence, but sensitive resources are also protected. Consider fish and wildlife conservation in all site feasibility studies and during project planning, design and construction.	1	SAIA, EO 13148, EO 13101, EO 11514, EO 11991, EO 13423	Annual	2011 - 2030	6. Ecosystem Integrity 7. INRMP Impact on the Installation Mission	Maintain populations of special status species and species diversity.
5.2.1			*Road Maintenance*						
5.2.1 (I, II, IV, V) 4.6.1 (XI)	O&MN	63126EPR Road	Develop and implement an Island Road Long-term Maintenance Plan that updates and improves road maintenance best management practices, applies the principles of "Integrated Vegetation Management", and adopts mowing instructions to meet multiple objectives for roadside maintenance to alleviate harmful environmental impacts and enhance possible benefits. Adopt a Mowing Instruction that provides roadside fire safety and minimizes detrimental environmental effects. Comply with CWA Section 404 Permit and Section 401 State Water Quality Certification.	1	SAIA, CWA Section 404 and 401 permits, EO 13423, ASBS	Five Years	2015, 2020, 2025, 2030	6. Ecosystem Integrity 7. INRMP Impact on the Installation Mission	Develop and implement an Island Road Long-Term Maintenance Plan.

Table D-7. Integrated Natural Resources Management Plan Implementation Summary, including the assignment of priorities based on legal driver behind each project (Continued).

INRMP Management Strategy	Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level	Legal Driver	Implementation		Natural Resources Metrics Builder	Desired Future Condition
						Frequency	Year		
5.3			*Communication Towers, Wind Farms, and Power Lines*						
5.3 (I, II, III, IV, V)	NBVC NR In House / Project Proponent		Ensure siting criteria are addressed through the Project Review Board (NBVCINST 11010). Any proposed towers will also comply with USFWS guidelines for reducing fatal bird strikes to the greatest extent practicable.	1	SAIA, NEPA, MBTA, EO 11514	Annual	2011 - 2030	6. Ecosystem Integrity 7. INRMP Impact on the Installation Mission	Utilize the Project Review Board (NBVC 11010).
5.4			*Beneficial Partnerships and Collaborative Resources Planning*						
4.1 (V) 5.1.1 (V)	NBVC NR In House		Participate in conservation, ecosystem, invasive species, and feral animal control planning in collaboration with other government agencies.	1	SAIA	Annual	2011 - 2030	3. Partnership Effectiveness	Participate in collaborative planning efforts with relevant state and federal agencies.
4.3.3.5 (II)	NBVC NR In House		Seek out and encourage partners to support independent scientific research and to develop cooperative research agreements focused on examining marine recruitment processes of important indicator species or species of concern.	1	SAIA	Annual	2011 - 2030	3. Partnership Effectiveness	Participate in collaborative planning efforts with relevant state and federal agencies.
4.5.2.5 (III) 4.5.2.6 (III)	NBVC NR In House		Remain an active participant with other agencies regarding San Nicolas Island fox and San Nicolas Island deer mouse issues.	1	SAIA	Annual	2011 - 2030	3. Partnership Effectiveness	Participate in collaborative planning efforts with relevant state and federal agencies.
4.6.1 (XVII)	NBVC NR In House		Support the integration of SNI into the Invasive Species Task Force on Santa Cruz Island and other Channel Islands as opportunities arise.	1	SAIA	Annual	2011 - 2030	3. Partnership Effectiveness	Participate in collaborative planning efforts with relevant state and federal agencies.
4.6.2 (IV)	NBVC NR In House		Promote cooperative interagency efforts to collect and analyze comprehensive aquatic invasive species monitoring data, including shared funding and staff.	1	SAIA	Annual	2011 - 2030	3. Partnership Effectiveness	Participate in collaborative planning efforts with relevant state and federal agencies.
5.4 (I, II, III, IV)	NBVC NR In House		Consult with USFWS and CDFG at least annually to fulfill SAIA provisions and related inter-agency cooperative agreements.	1	SAIA	Annual	2011 - 2030	3. Partnership Effectiveness	Participate in collaborative planning efforts with relevant state and federal agencies.
5.13.1 (IV)	NBVC NR In House		Consider the use of Cooperative Agreements to get work done, especially research. A long-term advisory relationship and cooperative research relationship could continue with local universities.	1	SAIA	Annual	2011 - 2030	3. Partnership Effectiveness	Participate in collaborative planning efforts with relevant state and federal agencies.
5.5			*Public Access*						
5.5 (I, II)	NBVC NR In House		Establish and implement clear, coherent policies regarding public access to SNI including the near short environment. Take active measures to discourage trespass and minimize the impacts of unauthorized access.	1	SAIA	Annual	2011 - 2030	4. Fish and Wildlife Management and Public Use	Establish policies for public access to SNI.
5.6			*Public Outreach*						
5.6 (I, II)	NBVC NR In House		Identify natural resource themes for public outreach. Participate in Earth Day and annual science festivals that occur in adjacent communities on the mainland.	1	SAIA	Annual	2011 - 2030	4. Fish and Wildlife Management and Public Use	Develop a public outreach program.

Table D-7. Integrated Natural Resources Management Plan Implementation Summary, including the assignment of priorities based on legal driver behind each project (Continued).

INRMP Management Strategy	Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level	Legal Driver	Implementation		Natural Resources Metrics Builder	Desired Future Condition
						Frequency	Year		
5.7			*Consistency with other Plans*						
5.13.1 (V)	NBVC NR In House		Ensure consistency with Coastal Zone Plans.	1	SAIA	Annual	2011 - 2030	3. Partnership Effectiveness	Coastal Zone Plan consistency.
5.7.1			*Consistency with Integrated Cultural Resource Management Plan*						
5.7.1 (I, II, III)	NBVC NR In House		Continue to participate in the Project Review Board and the Site Approval and Project Review Process and coordinate with the Cultural Resources program.	1	SAIA	Annual	2011 - 2030	1. INRMP Project Implementation	Participate in collaborative planning efforts with NBVC Cultural Resource management program.
5.8			*NEPA Compliance*						
4.6.1 (X) 5.1.1 (IX) 5.8 (I, II, III, IV)	NBVC NR In House		Continue to use NEPA planning processes and documentation to guide specific projects and document choices and enforce mitigation measures proposed in those NEPA documents.	1	SAIA, NEPA, EO 11514	Annual	2011 - 2030	1. INRMP Project Implementation	Comply with NEPA requirements.
5.9			*Stormwater Management*						
5.9 (I) 5.14 (III)	NBVC NR In House		Revise and implement the Storm Water Pollution Prevention Plan and water quality protection efforts throughout the SNI watershed.	1	SAIA, CWA, ASBS	Five Years	2015, 2020, 2025, 2030	6. Ecosystem Integrity	Implement the Storm Water Pollution Prevention Plan.
5.10			*Remediation of Contaminated Sediment*						
5.10 (I, II, III, IV)	NBVC NR In House		Collect and distribute data on sediment contamination to minimize risks to recreational and commercial water contact users, recreational and commercial fisheries, and to wildlife species.	1	SAIA, RCRA-HSWA, EO 13101, ASBS	Three Years	2013, 2016, 2019, 2022, 2025, 2028	6. Ecosystem Integrity	Monitor sediment contamination.
5.11			*Oil Spill or Hazardous Substance Prevention and Cleanup*						
5.11 (I, II, III)	NBVC NR In House		Integrate the protection priorities of this INRMP into the Emergency Response Action Plan and the Integrated Contingency Plan for Oil and Hazardous Substance Spill Prevention and Response.	1	SAIA, OPPA	Five Years	2015, 2020, 2025, 2030	6. Ecosystem Integrity	Implement the Emergency Response Action Plan and the Integrated Contingency Plan.
5.12			*Cumulative Effects*						
5.12 (I, II, III, IV, V)	NBVC NR In House		Support research to improve the adequacy of cumulative effects analysis, standardize the format in documents, and develop and implement compensation for cumulative effects.	1	SAIA, NEPA, EO 11514	Annual	2011 - 2030	1. INRMP Project Implementation	Maintain NEPA compliance.
5.12.1			*Shoreline Construction*						
5.12.1 (I, II, III, IV, V)	NBVC NR In House		Conserve existing habitat values by promoting experimentation and application of alternative shoreline and underwater habitat structures. Encourage refitting of developed shorelines and existing structures to enhance habitat values.	1	SAIA, CZMA	Annual	2011 - 2030	6. Ecosystem Integrity	Investigate and implement alternative shoreline structures.
5.12.1 (VI)	NBVC NR In House		Promote experimentation and application of alternative LID and habitat-friendly landscaped areas adjacent to the shore.	1	SAIA, CZMA, EO 13101	Annual	2011 - 2030	6. Ecosystem Integrity	Implement LID approaches adjacent to the shoreline.

Table D-7. Integrated Natural Resources Management Plan Implementation Summary, including the assignment of priorities based on legal driver behind each project (Continued).

INRMP Management Strategy	Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level	Legal Driver	Implementation		Natural Resources Metrics Builder	Desired Future Condition
						Frequency	Year		
5.13			*Natural Resources Consultation Requirements*						
5.13.1			*Project or Mitigation Planning*						
4.3.1 (VIII) 4.6.1 (XII) 5.13.1 (I, II, III, VI)	NBVC NR In House		Implement this INRMP by applying it as an initial screen for review of projects proposed on the installation from both Navy and outside interests to improve the success of mitigation and enhancement projects based on regulatory, functional, and ecosystem criteria.	1	SAIA, NEPA	Annual	2011 - 2030	1. INRMP Project Implementation	Develop and implement mitigation and enhancement projects.
5.13.1 (VII, VIII)	NBVC NR In House		Enforce Seasonal Avoidance Measures and Standard Mitigation Measures.	1	SAIA, NEPA, ESA	Annual	2011 - 2030	1. INRMP Project Implementation	Enforce measures.
5.14			*Landscaping and Grounds Maintenance*						
5.14 (I, II, IV, V, VI, VII, VIII, IX)	O&MN	63126EPR Landscape	Develop, implement, and revise as needed a Landscaping and Grounds Maintenance Plan and Instruction that outlines an appropriate landscaping and grounds maintenance program (e.g. that considers environmental factors and that adopts an Integrated Pest Management approach) to dealing with pest problems.	1	SAIA, EO 13148, EO 13112	Five Years	2015, 2020, 2025, 2030	6. Ecosystem Integrity	Develop and implement a Landscaping and Grounds Maintenance Plan.
5.16			*Outdoor Recreation*						
5.16 (I, II, III, IV)	NBVC NR In House		Develop, implement, and update as need an Outdoor Recreation Plan that identifies and evaluates suitable outdoor recreation opportunities for installation personnel in undeveloped areas and that continues to limit public access and outdoor recreation that are not consistent with the military mission at SNI.	1	SAIA, EO 12962	Five Years	2015, 2020, 2025, 2030	4. Fish and Wildlife Management and Public Use	Develop and implement an Outdoor Recreation Plan.
5.17			*Environmental Education*						
4.4.1 (II) 4.4.3 (XI) 4.5.1.1 (V) 4.5.1.2 (IV) 4.5.1.3 (III) 4.6.1 (II, IV) 5.17 (I, II, III, IV, V, VI, VII)	O&MN	63126EPR Education	Improve SNI community and environmental outreach through facilitating development of environmental education curriculum for researchers, personnel, and contractors. This will be accomplished by developing and distributing educational material, expanding education partnerships, by securing long-term funding to continue environmental education programs (e.g. brochures and videos), and evaluate the effectiveness of existing environmental education programs.	1	SAIA	Annual	2011 - 2030	4. Fish and Wildlife Management and Public Use 7. INRMP Impact on the Installation Mission	Maintain an environmental education program.
5.18			*Natural Resources Law Enforcement*						
5.18 (I, II)	NBVC NR In House		Provide information and education for the enforcement of natural resource laws and regulations by professionally trained personnel such as federal and state Conservation Officers.	1	SAIA	Annual	2011 - 2030	5. Team Adequacy 7. INRMP Impact on the Installation Mission	Enforce compliance with legal drivers.

Table D-7. Integrated Natural Resources Management Plan Implementation Summary, including the assignment of priorities based on legal driver behind each project (Continued).

INRMP Management Strategy	Funding Source	EPR Project Code	Project Description	Budget Priority / Class Level	Legal Driver	Implementation		Natural Resources Metrics Builder	Desired Future Condition
						Frequency	Year		
6.0			*Implementation Strategy*						
6.1			*General Considerations*						
6.1.4			*Personnel Training*						
6.1.4 (I, II)	NBVC NR In House		Maintain staff knowledge through training and participation in natural resource research and conservation programs and share information with natural resource experts.	1	SAIA	Annual	2011 - 2030	5. Team Adequacy	Maintain current knowledge in natural resource management.
6.2			*Adaptive Management*						
6.2.1			*Annual Update, Review, and Metrics*						
6.2.1 (I)	NBVC NR In House		Provide a notice of the intent to revise the INRMP to the USFWS and CDFG if a revision is found necessary.	1	SAIA	Annual	2011 - 2030	3. Partnership Effectiveness	Participate in collaborative planning efforts with relevant state and federal agencies.
6.2.1 (II, III, IV)	NBVC NR In House		Comply with recent CNI draft guidance on INRMPs and continue to utilize the INRMP Metrics Builder to assess implementation.	1	SAIA	Annual	2011 - 2030	1. INRMP Project Implementation	Utilize the INRMP Natural Resources Metrics Builder.
6.3			*Budget Considerations*						
6.3.2			*External Assistance*						
6.3.2.2			*Planned External Support*						
6.3.2.2 (I)	NBVC NR In House		Provide funding and support for research and other studies to further SNI natural resources management.	1	SAIA	Annual	2011 - 2030	1. INRMP Project Implementation	Conduct research and studies to further natural resources management.
6.4			*Funding Sources*						
6.4 (I)	NBVC NR In House		Provide documentation to secure appropriate levels of NBVC NR In House funding to support natural resource management programs.	1	SAIA	Annual	2011 - 2030	1. INRMP Project Implementation	Effective natural resource conservation and stewardship while supporting the military mission.
6.4 (II)	NBVC NR In House		Develop prioritized lists of proposed management efforts to guide development of funding proposals.	1	SAIA	Annual	2011 - 2030	1. INRMP Project Implementation	Effective natural resource conservation and stewardship while supporting the military mission.
6.4 (III, IV)	NBVC NR In House		Develop plans and documentation to secure external funding and continue to request external funding from other state and federal agencies.	1	SAIA	Annual	2011 - 2030	1. INRMP Project Implementation	Effective natural resource conservation and stewardship while supporting the military mission.
6.4 (V)	NBVC NR In House		Support scientific, academic, and volunteer efforts to initiate or supplement natural resources management programs.	1	SAIA	Annual	2011 - 2030	1. INRMP Project Implementation	Effective natural resource conservation and stewardship while supporting the military mission.
6.5			*INRMP Implementation Summary and Schedule*						
6.5 (I, II)	NBVC NR In House		Identify and ensure departments prioritize and allocate funding to support compliance requirements.	1	SAIA	Annual	2011 - 2030	1. INRMP Project Implementation	Effective natural resource conservation and stewardship while supporting the military mission.
6.5 (III)	NBVC NR In House		Seek awards for natural resource work conducted at SNI.	1	SAIA	Annual	2011 - 2030	1. INRMP Project Implementation	Effective natural resource conservation and stewardship while supporting the military mission.
6.5 (IV)	NBVC NR In House		Continue to ensure effective communication, adaptive oversight, and policy leadership through the USDON Natural Resources Strategic Plan.	1	SAIA	Annual	2011 - 2030	1. INRMP Project Implementation	Effective natural resource conservation and stewardship while supporting the military mission.

2. The plan provides certainty that the conservation effort will be effective.

A) Goals

The following are the SNI INRMP goals as identified in *Section 1.7: INRMP Vision, Goals and Objectives*:

- *Utilize adaptive management to maintain long term ecosystem health and minimize impacts to existing habitats consistent with the operational requirements of USDOD's training and testing mission.*
- *Facilitate sustainable military readiness and foreclose no options for future requirements of USDOD.*
- *Conserve the full suite of native species and restore ecological communities to self-sustaining levels.*
- *Achieve ecosystem resilience to mission impacts.*

B) Parameters

The specific objectives and management strategies for the black abalone, white abalone, island night lizard, western snowy plover and Guadalupe fur seal are identified in the relevant discussion that follows in this Appendix.

C) Monitoring

The specific monitoring activities for the black abalone, white abalone, island night lizard, western snowy plover and Guadalupe fur seal are identified in the relevant discussion that follows in this Appendix.

D) Report progress on implementation

The following is an excerpt from *Section 6.2.1: Annual Update, Review and Metrics* that describes the measures that will be taken to ensure that the provisions for reporting progress on implementation are adhered to:

"U.S. Department of Defense policy requires installations to review INRMPs annually in cooperation with the two primary partnering parties to the INRMP: USFWS and the state fish and wildlife agency. Annual reviews facilitate "adaptive management" by providing an opportunity to review the goals and objectives of the plan, as well as establish a realistic schedule for undertaking proposed actions. In addition to tracking the implementation of the INRMP, an annual report is to be provided that briefly summarizes the project and activities that have been implemented during the fiscal year and how these fulfill the objective identified in the INRMP.

Section 101(b)(2) of the SAIA [16 USC 670a(b)(2)] specifically directs that the INRMPs be reviewed "as to operation and effect" by the primary parties "on a regular basis, but not less often than every five years," emphasizing that the review is intended to determine whether existing INRMPs are being implemented to meet the requirements of the SAIA and contribute to the conservation and rehabilitation of natural resources on military installations. The OUSD guidance (17 May 2005) states that joint review should be reflected in a memo or letters.

Recent guidance on INRMP implementation interpreted that the five-year review would not necessarily constitute a "revision," that this would occur only if deemed necessary. The Annual Review process is broadly guided by the Real Estate Manual (USDOD4715.DD-R 1996) and by OPNAVINST 5090.1C, Environmental and Natural Resources Program Manual, 03 October 2007. Policy memoranda in 2002, and supplemented in 2004, clarified procedures for INRMP reviews and revisions:

- DUSD[I&E] Policy Memo 10 October 2002, which replaced a 1998 policy memorandum.
- ADUSD ESOH Policy Memo (01 November 2004).

The INRMP Implementation Guidance (10 October 2002 Memo) improved coordination external to USDOD (USFWS, state agencies, and the public) and internal to USDOD (military operators and trainers, cultural resources managers, pest managers). It also added new tracking procedures, called metrics, to ensure proper INRMP coordination occurred and that projects were implemented.

The 2002 guidance also required that each installation provide a notice of intent to prepare or revise the INRMP. Each military installation now must request that USFWS and the state fish and wildlife agency participate in both the development and review of the INRMPs. Current coordination guidelines are that the USFWS field office is the appropriate entry point for military installations, and the USFWS Regional Sikes Act Coordinator is the liaison to facilitate INRMP review.

The Supplemental USDOD INRMP Guidance (01 November 2004 Memo) further defined the scope of the annual and five-year review, public comment on INRMP reviews, and ESA consultation. A formal review must be performed by "the parties" at least every five years. Informal annual reviews are mandatory to facilitate adaptive management, during which INRMP goals, objectives, and "must fund" projects are reviewed, and a realistic schedule established to undertake proposed actions.

There is no legal obligation to invite the public either to review or to comment upon the parties' mutually agreed upon decision to continue implementation of an existing INRMP without revision. If the parties determine that substantial revisions to an INRMP are necessary, public comment shall be invited in conjunction with any required NEPA analysis.

In most cases INRMPs will incorporate by reference the results of an installation's previous species-by-species ESA consultations, including any reasonable and prudent measures identified in an incidental take statement. Neither a separate biological assessment nor a separate formal consultation should be necessary. Nonetheless, because the INRMP may include management strategies designed to balance the potentially competing needs of multiple species, it may be prudent to engage in informal consultation.

Objectives and Strategies for INRMP Annual Review

Objective: Improve and refine natural resources management, by adaptively adjusting success criteria and priorities based on past accomplishments, new risks and threats, new biological information, and changes in policy (USDOD 4715.DD-R 1996).

I. Provide a notice of intent to revise the INRMP to USFWS Field Office and the CDFG if a revision is found necessary. Ensure that the USFWS Regional Sikes Act Coordinator is notified.

II. Comply with recent CNI draft guidance (January 2005) on INRMPs and compliance with SAIA:

A. All INRMPs shall be reviewed annually by the USDOD installation with the cooperation of the USFWS and the state fish and wildlife agency, and others with a stake in the outcome of the INRMP at the discretion of the Conservation Program Manager. Annual reviews shall verify that:

1. Current information on all conservation metrics is available.

2. All "must fund" projects and activities have been budgeted for and implementation is on schedule.

3. All required trained natural resources positions are filled or are in the process of being filled.

4. Projects and activities for the upcoming year have been identified and included in the INRMP. An updated project list does not necessitate revising the INRMP.

5. All required coordinations have occurred.

6. All significant changes in the installation's mission requirements or its natural resources have been identified.

B. Establish a mutually agreed-upon, realistic schedule to undertake proposed actions.

C. The outcome of this joint review should be documented in a memorandum or letter summarizing the rationale for the conclusions the parties have reached. This written documentation should reflect the parties' mutual agreement.

III. Fulfill the reporting requirements of new measures to promote better understanding of the health of Navy conservation programs, using the "INRMP Metrics Builder" as defined by CNI. This is set of metrics for Navy natural resources programs measure conservation impacts on installation missions and the success of partnerships with the USFWS and state fish and game agencies as required by the SAIA. See Figure 6-1 for an introduction to the metrics.

A. Conduct a performance measure based self-review annually, based on the Metrics Builder (Figure 6-1). These tables use the Navy and Marine Corps Natural Resources Metrics Builder Reference Guide (04 May 2005) and updated based on the NAVFAC metrics website in March 2008.

1. Add SNI-specific questions.

2. Ensure long-term threats to the health of habitats, such as sea level rise and aquatic species invasion, are addressed.

3. Develop specific questions to support annual review process from the SNI's perspective.

IV. Track implementation to guide and learn from past experience.

A. Derive the most benefit possible from learning and experience by documenting it and disseminating the information to others.

B. To track the progress of each of the INRMP's strategies, a spreadsheet program (e.g. Paradox, Access) should be constructed and maintained. Fields can be included to help (a) build queries; (b) track progress by location, type, sponsor, year, etc.; and (c) provide different types of reports. This database was developed as part of this INRMP.

C. The GIS database (ARC/INFO) established for this INRMP should be maintained to track updates on various implementation activities, such as results of resource inventories, and locations of restoration projects."

E) Duration

The duration of this INRMP is from 2010 to 2030.

Black Abalone

1. The plan provides a conservation benefit to the species.

The plan will provide a cumulative benefit to the black abalone at SNI through protection of its habitat in the rocky intertidal zone and through management efforts focused on water quality protection of the ASBS. The INRMP will provide a cumulative benefit to the black abalone population through implementation of objectives and management strategies for the following sections: *Section 4.1: Ecosystem Approach*, *Section 4.2.1: Water Resources and Water Quality*, *Section 4.2.2: Soil Conservation*, *Section 4.3.3: Coastal and Marine Habitats and Communities*, *Section 4.3.3.2: Rocky Intertidal Community*, *Section 4.4.5: Marine Macroalgae and Plants*, *Section 4.4.6: Marine Invertebrates*, *Section 4.5.1.3: Black Abalone - Federally Endangered*, *Section 4.6.2: Aquatic Invasive Species*, *Section 4.8: Data Integration, Access, and Reporting*, *Section 5.1.1: Integrated Military Mission and Sustainable Land Use Decisions*, *Section 5.1.2: Adapting to Effects of Climate Change and Regional Growth*, *Section 5.4: Beneficial Partnerships and Collaborative Resources Planning*, *Section 5.8: NEPA Compliance*, *Section 5.9: Stormwater Management*, *Section 5.11: Oil Spill or Hazardous Substance Prevention and CleanUp*, *Section 5.12: Cumulative Effects*, *Section 5.12.1: Shoreline Construction*, *Section 5.13.1: Project and Mitigation Planning*, Section 5.17 Environmental Education, and *Section 5.18: Natural Resources Law Enforcement*. These management efforts will ensure that the black abalone population is maintained at SNI.

2. The plan provides certainty that the management plan will be implemented.

Projects that will be implemented at SNI that will provide a direct and or cumulative benefit to the black abalone population at SNI include:

- Black abalone management activities (63126-EPR-BlackAb);
- Marine resource management activities (63126-EPR-Marine);
- Erosion Control Plan (63126-EPR-Erosion);
- Climate Change Vulnerability Assessment (63126-EPR-Climate Change); and
- Natural Resource Education Activities (63126-EPR-Education).

3. The plan provides certainty that the conservation effort will be effective.

A) Biological objectives

Objective: Protect California black abalone habitat and existing populations.

B) Parameters/Management Strategies

Management Strategies for Black Abalone

I. Continue to conduct presence and absence surveys where suitable habitat exists and develop annual abalone monitoring protocols.

A. Map current survey sites established by Dr. VanBlaricom in the 1970s to establish functional GIS layers to facilitate management decisions and inform project review boards.

II. Implement complementary baseline surveys to provide additional information on current conditions and establish regular monitoring intervals.

A. Support establishment of rocky intertidal sites on SNI using accepted scientific methodologies to provide complementary data sets documenting trends of key rocky intertidal species assemblages.

B. Support scientific studies to investigate recruitment and predation.

C. Support the monitoring of key environmental variables that may play an important role in modulating population dynamics.

III. Develop educational materials for personnel and visitors informing them of black abalone issues and their role in helping to preserve the species.

IV. Continue to support appropriate closures at SNI.

A. Continue the SNI south side area closures, limiting access to and protecting habitat for the largest known black abalone population sites.

V. Continue to review all military activities to ensure compliance with ESA and avoid or minimize impacts to black abalone.

VI. Integrate historical monitoring data sets into SNI databases for management consideration.

VII. Support recovery plan efforts to establish stable black abalone populations.

A. Support Channel Islands-wide review of population status of the species.

C) Monitoring

Section 4.5.1.3: Black Abalone - Federally Endangered includes provisions for monitoring the black abalone population at SNI in management strategy I, II, and VI. These monitoring efforts will be included as a component of the black abalone management activities identified in the black abalone EPR (63126-EPR-BlackAb).

D) Report progress on implementation

Refer to the discussion of reporting progress on implementation for SNI Ecosystem management activities for the means by which NBVC will annually update and report on progress of implementation for the INRMP including management activities pertaining to the black abalone population.

E) Duration

The duration of the INRMP is from 2010 to 2030.

White Abalone

1. The plan provides a conservation benefit to the species.

The plan will provide a cumulative benefit to the white abalone at SNI through protection and maintenance of viable populations of white abalone in suitable rocky substrate habitat and through management efforts focused on water quality protection of the ASBS. The INRMP will provide a cumulative benefit to the white abalone population through implementation of objectives and management strategies for the following sections: *Section 4.1: Ecosystem Approach*, *Section 4.2.1: Water Resources and Water Quality*, *Section 4.2.2: Soil Conservation*, *Section 4.3.3: Coastal and Marine Habitats and Communities*, *Section 4.3.3.3: Nearshore Waters - Unvegetated Soft Bottom*, *Section 4.4.5: Marine Macroalgae and Plants*, *Section 4.4.6: Marine Invertebrates*, *Section 4.5.1.4: White Abalone - Federally Endangered*, *Section 4.6.2: Aquatic Invasive Species*, *Section 4.8: Data Integration, Access, and Reporting*, *Section 5.1.1: Integrated Military Mission and Sustainable Land Use Decisions*, *Section 5.1.2: Adapting to Effects of Climate Change and Regional Growth*, *Section 5.4: Beneficial Partnerships and Collaborative Resources Planning*, *Section 5.8: NEPA Compliance*, *Section 5.9: Stormwater Management*, *Section 5.11: Oil Spill or Hazardous Substance Prevention and CleanUp*, *Section 5.12: Cumulative Effects*, *Section 5.12.1: Shoreline Construction*, *Section 5.13.1: Project and Mitigation Planning*, and *Section 5.18: Natural Resources Law Enforcement*. These management efforts will ensure that the white abalone population is protected and maintained at SNI.

2. The plan provides certainty that the management plan will be implemented.

Projects that will be implemented at SNI that will provide a direct and or cumulative benefit to the white abalone population at SNI include:

- Marine resource management activities (63126-EPR-Marine);
- Erosion Control Plan (63126-EPR-Erosion);
- Climate Change Vulnerability Assessment (63126-EPR-Climate Change); and
- Natural Resource Education Activities (63126-EPR-Education).

3. The plan provides certainty that the conservation effort will be effective.

A) Objective

Objective: Protect and maintain viable populations of white abalone in suitable rocky substrate habitat at SNI.

B) Parameters

Management Strategies for White Abalone

I. Support efforts to identify white abalone habitat and densities of individuals around SNI.

  A. Support regular surveys and integrate historical data sets into SNI databases for management consideration.

  B. Support mapping of current survey sites to establish functional GIS layers to facilitate management decisions and project review boards.

II. Implement complementary baseline surveys to provide more obtainable information on current conditions and establish regular monitoring intervals.

A. Support scientific studies to investigate recruitment and predation.

III. Support recovery plan efforts to establish stable white abalone populations.

A. Support Channel Islands wide review of population status of the species.

C) Monitoring

Section 4.5.1.4: White Abalone - Federally Endangered include provisions for monitoring the white abalone population at SNI in management strategies I and II. These monitoring efforts will be included as a component of the marine resource management activities identified in the marine resource EPR (63126-EPR-Marine).

D) Report progress on implementation

Refer to discussion of reporting progress on implementation for SNI Ecosystem management activities for the means by which NBVC will annually update and report on progress of implementation for the INRMP including management activities pertaining to the white abalone population.

E) Duration

The duration of the INRMP is from 2010-2030.

Island Night Lizard

1. The plan provides a conservation benefit to the species.

The plan will provide a cumulative benefit to the island night lizard population at SNI by maintaining a viable population of island night lizards through habitat protections, monitoring, and compliance with BO provisions (e.g. BO 1-8-01-F-14 dated 15 October 2001). The INRMP will provide a cumulative benefit to the island night lizard population through implementation of objectives and management strategies for the following sections: *Section 4.1: Ecosystem Approach*, *Section 4.2.3: Wildland Fire Management*, *Section 4.3.1: Terrestrial Vegetation Communities*, *Section 4.3.1.1: Coastal Scrub*, *Section 4.4.2: Reptiles and Amphibians*, *Section 4.5.1: Federally Listed Species and Critical Habitat*, *Section 4.5.1.1: Island Night Lizard - Federally Threatened*, *Section 4.6.1: Terrestrial Invasive Exotic Species*, *Section 4.7.2: Pest/Predator Control*, *Section 4.8: Data Integration, Access, and Reporting*, *Section 5.1.1: Integrated Military Mission and Sustainable Land Use Decisions*, *Section 5.1.2: Adapting to Effects of Climate Change and Regional Growth*, *Section 5.2: Construction and Facility Maintenance*, *Section 5.2.1: Road Maintenance*, *Section 5.4: Beneficial Partnerships and Collaborative Resources Planning*, *Section 5.8: NEPA Compliance*, *Section 5.12: Cumulative Effects*, *Section 5.13.1: Project and Mitigation Planning*, *Section 5.14: Landscaping and Grounds Maintenance*, and *Section 5.18: Natural Resources Law Enforcement*. These management efforts will ensure that the island night lizard population is maintained as a viable population.

2. The plan provides certainty that the management plan will be implemented.

Projects that will be implemented at SNI that will provide a direct and or cumulative benefit to the island night lizard population at SNI include:

- Island night lizard surveys (63126-XXX-85);
- Feral cat removal (69232-240-86);
- Invasive Exotic Plant Eradication (69232-XXX-90);
- Vegetation Surveys (63126-XXX-89);
- Climate Change Vulnerability Assessment (63126-EPR-Climate Change);
- Wildland Fire Management Plan (63126-EPR-Fire); and
- Natural Resource Education Activities (63126-EPR-Education).

3. The plan provides certainty that the conservation effort will be effective.

A) Objective

Objective: Maintain a viable population of island night lizards on SNI.

B) Parameters

Management Strategies for the Island Night Lizard

I. Continue to develop and implement protocols to resolve any baseline biological data gaps and to monitor distribution, population size, population trends, and habitat usage of the island night lizard population.

- *A.* Conduct site-specific surveys in known or suitable habitat prior to disturbance activities.

II. Protect and maintain island night lizard habitat quality and integrity.

- *A.* Conduct an invasive non-native control, monitoring, and removal program in island night lizard habitat in order to reduce impacts upon the island night lizard population.
- *B.* Define and clearly mark work areas during road maintenance and other activities to prevent island night lizard mortality in accordance with the Terms and Conditions listed in the BO (USFWS 2001).
- *C.* Exclude high quality lizard habitat areas from the roadside-mowing regime.
- *D.* Maintain a bare ground buffer zone around equipment and storage areas in high quality island night lizard habitat where practicable.
- *E.* Site staging areas for storage of equipment and materials in areas with low island night lizard densities, whenever feasible.

III. Conduct relocation of island night lizards in accordance with the Terms and Conditions identified in the current BO (USFWS 2001).

IV. Support studies to investigate the effectiveness of island night lizard management strategies.

- *A.* Support scientific studies of competition relationships between alligator lizards and island night lizards.
- *B.* Support genetic studies of isolated island night lizard populations to determine population structure and size.

V. Educate island personnel on laws covering prohibition on taking listed species for pets or for sale in pet trade.

VI. Support recovery plan efforts to establish stable island night lizard populations and eventual delisting.

- *A.* Support Channel Islands-wide review of population status of the species.

C) Monitoring

Section 4.5.1.1: Island Night Lizard - Federally Threatened includes provisions for monitoring the island night lizard population in management strategy I. This monitoring effort will be included as a component of the island night lizard management activities identified in the island night lizard surveys EPR (63126-XXX-85).

D) Report progress on implementation

Refer to the discussion of reporting progress on implementation for SNI Ecosystem management activities for the means by which NBVC will annually update and report on progress of implementation for the INRMP including management activities pertaining to the island night lizard population.

E) Duration

The duration of the INRMP is from 2010 to 2030.

Western Snowy Plover

1. The plan provides a conservation benefit to the species.

The plan will provide a cumulative benefit to the western snowy plover at SNI through protection and maintenance of viable populations of western snowy plover and through management efforts focused on habitat conservation. The INRMP will provide a cumulative benefit to the western snowy plover population through implementation of objectives and management strategies for the following sections: *Section 4.1: Ecosystem Approach*, *Section 4.3.3: Coastal and Marine Habitats and Communities*, *Section 4.3.3.1: Sandy Beaches*, *Section 4.4.3: Birds*, *Section 4.5.1: Federally Listed Species and Critical Habitat*, *Section 4.5.1.2: Western Snowy Plover - Federally Threatened*, *Section 4.6.1: Terrestrial Invasive Exotic Species*, *Section 4.6.2: Aquatic Invasive Species*, *Section 4.7.2: Pest/Predator Control*, *Section 4.8: Data Integration, Access, and Reporting*, *Section 5.1.1: Integrated Military Mission and Sustainable Land Use Decisions*, *Section 5.1.2: Adapting to Effects of Climate Change and Regional Growth*, *Section 5.2: Construction and Facility Maintenance*, *Section 5.4: Beneficial Partnerships and Collaborative Resources Planning*, *Section 5.8: NEPA Compliance*, *Section 5.9: Stormwater Management*, *Section 5.11: Oil Spill or Hazardous Substance Prevention and CleanUp*, *Section 5.12: Cumulative Effects*, *Section 5.12.1: Shoreline Construction*, *Section 5.13.1: Project and Mitigation Planning*, and *Section 5.18: Natural Resources Law Enforcement*. These management efforts will ensure that the western snowy plover population is protected and maintained at SNI.

2. The plan provides certainty that the management plan will be implemented.

Projects that will be implemented at SNI that will provide a direct and or cumulative benefit to the western snowy plover population at SNI will include:

- Western snowy plover monitoring and habitat protection (Navy tenant funded);
- Feral cat removal (69232-240-86);
- Invasive Exotic Plant Eradication (69232-XXX-90);
- Climate Change Vulnerability Assessment (63126-EPR-Climate Change);
- Erosion Control Plan (63126-EPR-Erosion);
- Dune Drift Management Plan (631269-EPR-Dune;)
- Marine Resource Management Activities (63126-EPR-Marine);
- Migratory and Resident Bird Management Activities (63126-EPR-Bird); and
- Natural Resource Education Activities (63126-EPR-Education).

3. The plan provides certainty that the conservation effort will be effective.

A) Objective

Objective: Protect, monitor and maintain a viable population of western snowy plovers.

B) Parameters

Management Strategies for Western Snowy Plover

I. Protect western snowy plover populations and habitat.

A. Maintain compliance with the ESA by closing nesting areas to recreational activity during the March 1 - September 15 breeding season. Alternative measures to ensure compliance will be evaluated periodically.

B. Maintain signs around breeding sites to alert personnel of closures.

C. Conduct an invasive non-native control, monitoring, and removal program in western snowy plover habitat to reduce impacts upon the western snowy plover population.

D. Remove unnecessary structures in snowy plover nesting areas in accordance with the Terms and Conditions of the BO (USFWS 2001) and attach avian excluders to essential structures, if feasible.

E. Conduct amphibious training exercises on beaches not harboring nesting snowy plovers.

II. Monitor western snowy plover populations and habitat.

A. Conduct island-wide snowy plover censuses twice annually, once during the breeding season and once during the winter season. Alternative monitoring programs may be implemented if they are determined to provide adequate monitoring data.

B. Monitor snowy plover nests during missile or target launches, general operations, and other activities that may disturb nesting behaviors in accordance with the Terms and Conditions listed in the BO (USFWS 2001).

C. Conduct site-specific snowy plover surveys in potential or known breeding habitat prior to disturbance activities as required by the BO (USFWS 2001).

D. Increase efforts to determine nesting success of snowy plovers.

III. Support research to explore the effects of increasing pinniped populations on nesting success of snowy plovers.

IV. Educate island personnel regarding protected species regulations and responsibilities.

V. Develop and maintain a computer database for storing information on locations of nesting sites, incidental sightings and size and results of surveys for resource management purposes.

VI. Support recovery plan efforts to establish stable western snowy plover populations and eventual delisting.

A. Continue to participate with recovery planning and other efforts to help establish stable snowy plover populations.

C) Monitoring

Section 4.5.1.2: Western Snowy Plover - Federally Threatened includes provisions for monitoring the western snowy plover population at SNI in management strategies II and V. This monitoring effort will be included as a component of the western snowy plover monitoring and management activities that are Navy tenant funded.

D) Report progress on implementation

Refer to the discussion of reporting progress on implementation for SNI Ecosystem management activities for the means by which NBVC will annually update and report on progress of implementation for the INRMP including management activities pertaining to the western snowy plover population.

E) Duration

The duration of the INRMP is from 2010 to 2030.

Guadalupe Fur Seal

1. The plan provides a conservation benefit to the species.

The plan will provide a cumulative benefit to the Guadalupe fur seal at SNI through monitoring efforts, protection of marine mammal haul out sites, and through management efforts focused on water quality protection of the ASBS. The INRMP will provide a cumulative benefit to the Guadalupe fur seal population that utilizes SNI's marine mammal haul out sites through implementation of objectives and management strategies for the following sections: *Section 4.1: Ecosystem Approach*,

Section 4.2.1: Water Resources and Water Quality, *Section 4.3.3: Coastal and Marine Habitats and Communities*, *Section 4.3.3.1: Sandy Beaches*, *Section 4.3.3.2: Rocky Intertidal Community*, *Section 4.3.3.4: Nearshore Waters - Vegetated Soft Bottom*, *Section 4.4.5: Marine Macroalgae and Plants*, *Section 4.4.7: Fishes*, *Section 4.4.8: Marine Mammals*, *Section 4.5.1: Federally Listed Species and Critical Habitat*, *Section 4.5.1.5: Guadalupe Fur Seal - Federally Threatened*, *Section 4.6.2: Aquatic Invasive Species*, *Section 4.8: Data Integration, Access, and Reporting*, *Section 5.1.1: Integrated Military Mission and Sustainable Land Use Decisions*, *Section 5.1.2: Adapting to Effects of Climate Change and Regional Growth*, *Section 5.2: Construction and Facility Maintenance*, *Section 5.4: Beneficial Partnerships and Collaborative Resources Planning*, *Section 5.8: NEPA Compliance*, *Section 5.9: Stormwater Management*, *Section 5.11: Oil Spill or Hazardous Substance Prevention and CleanUp*, *Section 5.12: Cumulative Effects*, *Section 5.12.1: Shoreline Construction*, *Section 5.13.1: Project and Mitigation Planning*, and *Section 5.18: Natural Resources Law Enforcement*. These management efforts will ensure that the Guadalupe fur seal population that utilizes SNI's marine mammal haul out sites are protected and maintained at SNI.

2. The plan provides certainty that the management plan will be implemented.

Projects that will be implemented at SNI that will provide a direct and or a cumulative benefit to the Guadalupe fur seal population at SNI will include:

- Pinniped Monitoring (63126-XXX-88);
- Climate Change Vulnerability Assessment (63126-EPR-Climate Change);
- Dune Drift Management Plan (63126-EPR-Dune);
- Marine Resource Management Activities (63126-EPR-Marine); and
- Natural Resource Education Activities (63126-EPR-Education).

3. The plan provides certainty that the conservation effort will be effective.

A) Objective

Objective: Resolve baseline biological data gaps for Guadalupe fur seal populations at SNI.

B) Parameters

Management Strategies for the Guadalupe Fur Seal

I. Support on-going and new research on distribution and ecology of the Guadalupe fur seal. Encourage academic institutions to facilitate resource data collection.

II. Record all sightings of Guadalupe fur seals and develop a database to track numbers of individuals, time of year, and location.

C) Monitoring

Section 4.5.1.5: Guadalupe Fur Seal - Federally Threatened includes provisions for monitoring the Guadalupe fur seal population that utilizes SNI's marine mammal haul out sites in management strategy II. This monitoring effort will be included as a component of the pinniped management activities identified in the Pinniped monitoring EPR (63126-XXX-88).

D) Report progress on implementation

Refer to the discussion of reporting progress on implementation for SNI Ecosystem management activities for the means by which NBVC will annually update and report on progress of implementation for the INRMP including management activities pertaining to the Guadalupe fur seal population.

E) Duration

The duration of the INRMP is from 2010 to 2030.

Appendix E: Species List

E.1 Plants

Terrestrial - Vascular Plants

Nomenclature reference: Junak 2008.

Table E-1. Vascular plant species recorded on San Nicolas Island from 1993-2009 (TDI 2009) .

Species name	Common name	Native/ Exotic	Sensitive Status
PTERIDOPHYTES (Ferns and Allies)			
Family Polypodiaceae			
Polypodium californicum	California polypody	N	
Family Pteridaceae			
Adiantum jordani	California maidenhair	N	
Pellaea andromedifolia	coffee fern	N	
Pentagramma triangularis ssp. *triangularis*	goldback fern	N	
Family Alliaceae			
Dichelostemma capitatum	blue dicks	N	
Family Cyperaceae			
Eleocharis macrostachya	pale spikerush	N	
Schoenoplectus americanus	three-square	N	
Family Juncaceae			
Juncus bufonius	toad rush	N	
Family Poaceae			
Achnatherum diegoense	San Diego needlegrass	N	
Ammophila arenaria	European beachgrass	E	
Arundo donax	giant reed	E	
Avena barbata	slender wild oats	E	
Avena fatua	wild oats	E	
Brachypodium distachyon	purple false brome	E	
Bromus arizonicus	Arizona brome	N	
Bromus carinatus var. *carinatus*	California brome	N	
Bromus catharticus var. *catharticus*	rescue grass	E	
Bromus diandrus	ripgut brome	E	
Bromus hordeaceus	soft chess	E	
Bromus madritensis	Madrid brome	E	
Bromus maritimus	maritime brome	N	
Bromus rubens	red brome	E	
Cortaderia selloana	pampas grass	E	
Cynodon dactylon	Bermuda grass	E	
Distichlis spicata	saltgrass	N	
Festuca arundinacea	tall fescue	E	
Hordeum brachyantherum ssp. *californicum*	California barley	N	
Hordeum intercedens	vernal barley, little barley	N	
Hordeum marinum ssp. *gussoneanum*	Mediterranean barley	N	
Hordeum murinum	farmer's foxtail	E	
Hordeum murinum ssp. *glaucum*	farmer's foxtail	E	
Hordeum murinum ssp. *leporinum*	barley	E	
Hordeum vulgare var. *vulgare*	cultivated barley	E	
Lamarckia aurea	goldentop	E	

Table E-1. Vascular plant species recorded on San Nicolas Island from 1993-2009 (TDI 2009) (Continued).

Species name	Common name	Native/ Exotic	Sensitive Status
Lolium multiflorum	annual ryegrass, Italian rye	E	
Lolium perenne	perennial ryegrass, english rye	E	
Melica imperfecta	coast range melic, small-flowered melic	N	
Nassella cernua	nodding needlegrass	N	
Nassella lepida	foothill needlegrass, small-flowered needlegrass	N	
Nassella pulchra	purple needlegrass	N	
Parapholis incurva	sickle grass	E	
Pennisetum clandestinum	Kikuyu grass	E	
Phalaris aquatica	harding grass	E	
Phalaris caroliniana	Carolina canary grass	E	
Phalaris minor	Mediterranean canary grass	E	
Phalaris paradoxa	hooded canary grass	E	
Piptatherum miliaceum ssp. *miliaceum*	rice grass, smilo grass	E	
Poa annua	annual bluegrass	E	
Poa secunda ssp. *secunda*	Pacific bluegrass	N	
Polypogon monspeliensis	rabbitsfoot grass	E	
Schismus arabicus	Arabian schismus	E	
Stenotaphrum secundatum	Saint Augustine grass	E	
Triticum aestivum	common wheat	E	
Vulpia myuros	foxtail fescue	E	
Vulpia octoflora var. *hirtella*	six-weeks fescue	N	
Family Ruppiaceae			
Ruppia maritima	ditchgrass	N	
Family Typhaceae			
Typha domingensis	narrowleaf cattail	N	
Typha latifolia	broadleaf cattail	N	
Family Zosteraceae			
Phyllospadix scouleri	Scouler's surf grass	N	
Phyllospadix torreyi	Torrey's surf grass	N	
Zostera pacifica	eelgrass	N	
DICOTS			
Family Aizoaceae			
Carpobrotus chilensis	sea fig	E	
Carpobrotus edulis	hottentot fig	E	
Delosperma litorale	seaside delosperma	E	
Malephora crocea	coppery mesembryanthemum	E	
Mesembryanthemum crystallinum	crystalline iceplant	E	
Mesembryanthemum nodiflorum	small-flowered iceplant	E	
Tetragonia tetragonioides	New Zealand spinach	E	
Family Anacardiaceae			
Schinus molle	Peruvian pepper tree, California pepper tree	E	
Toxicodendron diversilobum	poison oak	N	
Family Apiaceae			
Apiastrum angustifolium	wild celery	N	
Apium graveolens	celery	E	
Berula erecta	cut-leaf water parsnip	N	
Conium maculatum	poison hemlock	E	
Daucus carota	wild carrot, Queen Anne's lace	E	
Daucus pusillus	rattlesnake weed	N	
Foeniculum vulgare	sweet fennel	E	
Lomatium insulare	San Nicolas Island lomatium	N	CBI-E, FC2, CNPS 1B
Sanicula arguta	sharp-toothed snakeroot	N	
Torilis nodosa	knotted hedge-parsley	E	
Family Asteraceae			
Achillea millefolium	yarrow, milfoil	N	
Amblyopappus pusillus	pineapple weed	N	
Ambrosia chamissonis var. *bipinnatisecta*	silver beach weed, beach bur	N	
Ambrosia psilostachya	western ragweed	N	
Artemisia californica	coastal sagebrush	N	
Artemisia nesiotica	island sagebrush	N	CI-E, CNPS 4
Baccharis pilularis	coyote brush	N	
Baccharis salicifolia	mule fat	N	
Calendula officinalis	garden marigold, pot marigold	E	
Centaurea melitensis	tocalote	E	
Centaurea solstitialus	yellow star thistle	E	

Table E-1. Vascular plant species recorded on San Nicolas Island from 1993-2009 (TDI 2009) (Continued).

Species name	Common name	Native / Exotic	Sensitive Status
Chrysanthemum coronarium	crown daisy	E	
Cirsium occidentale	cobwebby thistle, western thistle	N	
Conyza bonariensis	flax-leaved fleabane	E	
Conyza canadensis	horseweed	E	
Coreopsis gigantea	giant coreopsis	N	
Cotula coronopifolia	brass buttons	E	
Cynara cardunculus	cardoon, artichoke thistle	E	
Deinandra clementina	Catalina tarplant	N	CI-E, CNPS 4
Encelia californica	bush sunflower	N[1]	
Gnaphalium palustre	lowland cudweed, western marsh cudweed	N	
Helianthus annuus	common sunflower	N	
Heterotheca grandiflora	telegraph weed	N	
Hypochaeris radicata	hairy cat's ear	E	
Isocoma menziesii var. *menziesii*	coastal goldenbush	N	
Isocoma menziesii var. *vernoniodes*	coastal goldenbush	N	
Lactuca serriola	prickly lettuce	E	
Lasthenia gracilis	goldfields	N	
Malacothrix foliosa var. *polycephala*	San Nicolas Island malacothrix	N	CI-E, CNPS 4
Malacothrix incana	dune malacothrix, dunedelion	N	
Malacothrix saxatilis var. *implicata*	cliff malacothrix	N	
Malacothrix saxatilis var. *tenuifolia*	cliff aster	E	
Microseris douglasii ssp. *douglasii*	microseris	N	
Microseris douglasii ssp. *tenella*	microseris	N	
Microseris elegans	microseris	N	
Picris echioides	bristly ox tongue	E	
Pseudognaphalium biolettii	bicolored everlasting	N	
Pseudognaphalium californicum	green everlasting	N	
Pseudognaphalium luteo-album	weedy cudweed	E	
Pseudognaphalium stramineum	cotton batting	N	
Senecio vulgaris	common groundsel	E	
Silybum marianum	milk-thistle	E	
Sonchus asper	prickly sow thistle	E	
Sonchus oleraceus	common sow thistle	E	
Sonchus tenerrimus	slender sow thistle	E	
Stebbinsoseris heterocarpa	stebbinsoseris	N	
Taraxacum officinale	common dandelion	E	
Tragopogon porrifolius	salsify, oyster plant	E	
Uropappus lindleyi	silver puffs	N	
Xanthium strumarium	cocklebur	E	
Family Boraginaceae			
Amsinckia menziesii var. *intermedia*	common fiddleneck	N	
Amsinckia spectabilis var. *spectabilis*	seaside fiddleneck	N	
Cryptantha maritima	Guadalupe Island cryptantha	N	
Cryptantha traskiae	Trask's cryptantha	N	CI-E, FC2, CNPS 1B
Heliotropium curassavicum	heliotrope	N	
Pectocarya linearis ssp. *ferocula*	slender comb seed	N	
Family Brassicaceae			
Brassica nigra	black mustard	E	
Brassica tournefortii	Sahara mustard	E	
Cakile edentula ssp. *edentula*	sea rocket	E	
Cakile maritima ssp. *maritima*	sea rocket	E	
Dithyrea maritima	beach spectacle pod	N	CT, CNPS 1B
Draba cuneifolia var. *integrifolia*		N	
Hirschfeldia incana	short-podded mustard	E	
Hornungia procumbens	hornungia	N	
Lepidium lasiocarpum var. *lasiocarpum*	sand peppergrass	N	CNPS 1B
Lepidium nitidum var. *nitidum*	shining peppergrass	N	
Lepidium oblongum var. *insulare*	lentejilla	N	
Lobularia maritima	sweet alyssum	E	
Nasturtium officinale	water cress	E	
Raphanus sativus	wild radish	E	
Sisymbrium irio	London rocket	E	
Sisymbrium orientale	Indian hedge mustard	E	
Family Cactaceae			
Opuntia ficus-indica	mission cactus	E	

Table E-1. Vascular plant species recorded on San Nicolas Island from 1993-2009 (TDI 2009) (Continued).

Species name	Common name	Native/ Exotic	Sensitive Status
Opuntia littoralis	coastal prickley pear	N	
Opuntia oricola	tall prickley pear	N	
Opuntia prolifera	coastal cholla	N	
Family Caryophylaceae			
Herniaria hirsuta ssp. *cinerea*	hairy rupturewort	E	
Loeflingia squarrosa	spreading pygmy leaf	N	
Sagina apetala	dwarf pearlwort	N	
Silene gallica	windmill pink	E	
Spergularia bocconii	sand spurry	E	
Spergularia macrotheca var. *macrotheca*	large-flowered sand spurry	N	
Spergularia salina	saltmarsh sand spurrey	N	
Family Chenopodiaceae			
Aphanisma blitoides	aphanisma	N	CNPS 1B
Atriplex argentea ssp. *mohavensis*	silverscale	N	
Atriplex californica	California saltbush	N	
Atriplex canescens var. *canescens*	four-wing saltbush	N	
Atriplex coulteri	Coulter's saltscale	N	
Atriplex lentiformis	quail bush, Brewer's saltbush	N	
Atriplex leucophylla	sea scale	N	
Atriplex pacifica	South Coast saltscale	N	
Atriplex prostrata	spear-leaf saltbush	E	
Atriplex semibaccata	Australian saltbush	E	
Atriplex watsonii	matscale	N	
Bassia hyssopifolia	five-hook bassia	E	
Chenopodium ambrosioides	epazote, Mexican tea	E	
Chenopodium berlandieri	goosefoot	E	
Chenopodium californicum	soap plant	N	
Chenopodium murale	nettle-leaf goosefoot	E	
Salicornia depressa	pickleweed	N	
Salsola kali ssp. *pontica*	saltwort	E	
Salsola tragus	Russian thistle, tumbleweed	E	
Suaeda taxifolia	woolly seablite	N	
Family Convolvulaceae			
Calystegia macrostegia ssp. *amplissima*	Southern Island morning glory	N	CI-E, FC2, CNPS 4
Calystegia malacophylla ssp. *pedicellata*	morning glory	E	
Calystegia soldanella	beach morning glory	N	
Convolvulus arvensis	bindweed	E	
Cressa truxillensis	spreading alkali weed	N	
Family Crassulaceae			
Crassula connata	pygmy weed	E	
Dudleya virens var. insularis	Palos Verdes live forever	N	CNPS 1B.2
Family Cucurbitaceae			
Marah macrocarpus var. major	wild cucumber	N	
Family Euphorbiaceae			
Ricinus communis	castor bean	E	
Family Fabaceae			
Astragalus didymocarpus var. *didymocarpus*	common dwarf locoweed, two-seeded milkvetch	N	
Astragalus traskiae	Trask's locoweed	N	CNPS 1B.2 State S2.2
Lotus argophyllus var. *argenteus*	Southern Island silver lotus	N	
Lotus salsuginosus var. *salsuginosus*	coastal lotus	N	
Lupinus albifrons var. *douglasii*	silver lupine	N	
Lupinus bicolor	dove lupine	N	
Lupinus succulentus	succulent lupine	E	
Medicago polymorpha	bur clover	E	
Medicago sativa	alfalfa	E	
Melilotus albus	white sweet clover	E	
Melilotus indicus	yellow sweet clover	E	
Robinia pseudoacacia	black locust	E	
Spartium junceum	Spanish broom	E	
Trifolium albopurpureum	rancheria clover	N	
Trifolium depauperatum var. *truncatum*	dwarf bladder clover	N	
Trifolium gracilentum	pinpoint clover	N	
Trifolium microcephalum	small-headed clover	N	
Trifolium microdon	Valparaiso clover	N	

Table E-1. Vascular plant species recorded on San Nicolas Island from 1993-2009 (TDI 2009) (Continued).

Species name	Common name	Native / Exotic	Sensitive Status
Trifolium palmeri	southern island clover	N	CBI-E, CNPS 4
Trifolium willdenovii	tomcat clover	N	
Vicia hassei	slender vetch	N	
Vicia sativa ssp. *sativa*	common vetch, spring vetch	E	
Vicia villosa ssp. *varia*	winter vetch	E	
Family Frankeniaceae			
Frankenia salina	alkali heath, yerba reuma	N	
Family Gentianaceae			
Zeltnera venusta	canchalagua	N	
Family Geraniaceae			
Erodium botrys	broad-leaf filaree	E	
Erodium cicutarium	redstem filaree	E	
Erodium moschatum	whitestem filaree	E	
Pelargonium peltatum	ivy-leaved geranium	E	
Pelargonium x *hortorum*	garden geranium	E	
Family Hydrophyllaceae			
Nemophila pedunculata	nemophila	N	
Phacelia distans	phacelia	N	
Family Lamiaceae			
Marrubium vulgare	horehound	E	
Family Loasaceae			
Mentzelia affinis	hydra stick-leaf	E	
Family Lythraceae			
Lythrum hyssopifolia	common loosestrife	E	
Family Malvaceae			
Lavatera assurgentiflora ssp. *assurgentiflora*	malva rosa, northern island tree mallow	N	CNPS 1B
Malva parviflora	cheeseweed	E	
Family Myoporaceae			
Myoporum laetum	myoporum	E	
Family Nyctaginaceae			
Abronia maritima	sticky sand verbena	N	
Abronia umbellata var. *umbellata*	beach sand verbena	N	
Family Onagraceae			
Camissonia cheiranthifolia ssp. *cheiranthifolia*	beach primrose	N	
Camissonia cheiranthifolia ssp. *suffruticosa*	beach primrose	N	
Family Orobanchaceae			
Orobanche fasiculata	clustered broom rape	N	
Orobanche parishii ssp. *brachyloba*	short-lobed broom rape	N	
Family Oxalidaceae			
Oxalis corniculata	creeping wood sorrel	E	
Oxalis pes-caprae	Bermuda buttercup	E	
Family Papaveraceae			
Eschscholzia californica ssp. *californica*	California poppy	E	
Eschscholzia ramosa	island poppy	N	CBI-E, CNPS 4
Platystemon californicus	cream cups	N	
Family Plantaginaceae			
Plantago coronopus	cut-leaved plantain	E	
Plantago major	common plantain	E	
Plantago ovata (insularis)	plantain	N	
Family Polemoniaceae			
Gilia nevinii	island gilia	N	CBI-E, CNPS 4
Family Polygonaceae			
Eriogonum cinereum	ashy-leaf buckwheat	E	
Eriogonum fasciculatum var. *polifolium*	eastern Mojave buckwheat	E	
Eriogonum grande var. *timorum*	San Nicolas Island buckwheat	N	CE, CNPS 1B
Polygonum arenastrum	common knotweed	E	
Polygonum argyrocoleon	Persian knotweed	E	
Pterostegia drymarioides	fairy mist	N	
Rumex crispus	curly dock	E	
Rumex obtusifolius	bitter dock	E	
Rumex salicifolius	willow dock	N	

Table E-1. Vascular plant species recorded on San Nicolas Island from 1993-2009 (TDI 2009) (Continued).

Species name	Common name	Native/ Exotic	Sensitive Status
Family Portulacaceae			
Calandrinia ciliata	red maids	N	
Claytonia parviflora ssp. *parviflora*	miner's lettuce	N	
Claytonia perfoliata ssp. *mexicana*	miner's lettuce	N	
Family Primulaceae			
Anagallis arvensis	scarlet pimpernel	E	
Primula clevelandii ssp. *insulare*	shooting star	N	
Family Resedaceae			
Oligomeris linifolia	oligomeris	N	
Family Rubiaceae			
Galium aparine	cleavers grass, goose grass	E	
Family Salicaceae			
Salix exigua	sand bar willow	N	
Salix lasiolepis	arroyo willow	N	
Family Saururaceae			
Anemopsis californica	yerba mansa	N	
Family Saxifragaceae			
Jepsonia malvifolia	island jepsonia	N	CBI-E, FC2, CNPS 4
Family Scrophulariaceae			
Castilleja densiflora	owl's clover	N	
Family Solanaceae			
Lycium brevipes	desert boxthorn	N	
Lycium californicum	California boxthorn	N	
Lycium verrucosum	San Nicolas Island boxthorn	N	Extirpated, CNPS 1B
Nicotiana glauca	tree tobacco	E	
Solanum americanum	white nightshade	E	
Solanum douglasii	Douglas' nightshade	N	
Solanum lycopersicum var. *lycopersicum*	tomato	E	
Family Tamaricaceae			
Tamarix ramosissima	saltcedar	E	
Family Urticaceae			
Parietaria hespera var. *californica*	western pellitory	N	
Soleirolia soleirolii	mother-of-thousands	E	
Family Verbenaceae			
Verbena lasiostachys var. *lasiostachys*	western verbena	E	

1. Bush sunflower (Encelia californica) is native to California, but is introduced to San Nicolas Island.

Terrestrial - Moss and Lichens

Table E-2. Mosses and lichens on San Nicolas Island (Smith 1993) .

MOSSES (Class Musci)[a]	
Barbula brachyphylla	*Didymodon tophaceus*
Barbula vinealis	*Entosthodon bolanderi* Borlander's entosthodon moss
Ceratodon purpureus	*Eucladium verticillatum*
Crossidium desertorum desert tassle-leaf moss	*Scleropodium californicum* California hard-stalk moss
LICHENS	
Acarospora scheicheri	*Collema critatum*
Acarospora thelococcoides	*Collema tenax*
Acrocordia conoidea	*Cresponea chloroconia*
Amandinea punctata	*Dendrographa leucophaea*
Arthonia pruinata	*Dimelaena radiata*
Arthothelium orbilliferum	*Diploicia canescens*
Arthothelium sanguineum	*Diploschistes actinostomus*

a. Sources:
Harthill, M.P., D.M. Long and B.D. Mishler. 1979. Preliminary list of Southern California Mosses. In theBryologist 82 (2).
Mishler, B.D. 1978. The Mosses of the Channel Islands, California. Madrofio 21: 435-438.

Table E-2. Mosses and lichens on San Nicolas Island (Smith 1993) (Continued).

Bacidia inularis	*Diploschistes diacapsis*
Bacidia jacobii	*Diploschistes scruposus*
Buellia alboatra	*Diplotomma alboatrum*
Buellia bolacina	*Dirina catalinariae*
Buellia fimbriata	*Distopyrenis americana*
Buellia halonia	*Endocarpon lepidallum*
Buellia oidalea	*Endocarpon pusillum*
Buellia saxicola	*Endocarpon subnitescens*
Buellia spuria	*Evernia prunastri*
Buellia turgescens	*Flavopunctelia flaventior*
Buellia venusta	*Fulgensia bracteata*
Caloplaca bolacina	*Fulgensia desertorum*
Caloplaca californica	*Heterodermia comosa*
Caloplaca cerina	*Heterodermia erinacea*
Caloplaca coralloides	*Heterodermia leucomelos*
Caloplaca decipiens	*Heterodermia namaquana*
Caloplaca holocarpa	*Heteroplacidium acarosporoides*
Caloplaca luteominia luteo	*Lecanactis californica*
Caloplaca rosei	*Lecanactis dimelaenoides*
Caloplaca stantonii	*Lecanactis salicina*
Caloplaca stipitata	*Lecania californica*
Candelariella aurella	*Lecania cyrtella*
Candelariella xanthostigma	*Lecania dudleyi*
Catapyrenium lachneum	*Lecania fuscella*
Catapyrenium lacinulatum	*Lecania subdispersa*
Catapyrenium pilosellum	*Lecanographa lynceoides*
Catapyrenium squamulosum	*Lecanora caesiella*
Catillaria franciscana	*Lecanora caesiorubella ssp merrillii*
Catillaria globulosa	*Lecanora crenulata*
Chrysothrix candelaris	*Lecanora dispersa*
Cliostomum griffithii	*Lecanora gangaleoides*
Collema bachmanianum	*Lecanora horiza*
Collema coccophorum	*Lecanora pacifica*
Lecanora subcarnea	*Toninia aromatica*
Lecanora symmicta	*Toninia ruginosa pacific*
Lecanora varia	*Toninia ruginosa ruginos*
Lecanora xylophila	*Toninia sedifolia*
Lecidella asema	*Toninia submexicana*
Leprocaulon microscopicum	*Toninia talparum*
Leproloma sp.	*Vermilacinia cephalota*
Niebla palmeri	*Ramalina subleptocarpha*
Niebla ramosissima	*Rinodina exigua*
Opegrapha atra	*Rocella babingtonii*
Opegrapha herbarum	*Roccella fimbriata*
Opegrapha varia	*Sarcogyne regularis*
Pertusaria amara	*Sarcogyne similis*
Pertusaria flavicunda	*Schismatomma rediunta*
Physcia tenella	*Schizopelte californica*
Physconia enteroxantha	*Sigridia californica*
Physconia isidiigera	*Solenopsora caesia*
Placidium californicum	*Solenopsora crenata*
Placidium pilosellum	*Solenopsora venturae*
Placidium squamuloum	*Teloschistes californicus*
Pleopsidium chlorophanum	*Teloschistes exilis*
Psora decipiens	*Tephromela atra*
Punctelia borreri	*Tephromela nashii*
Pyrrhospora quernea	*Vermilacinia nylanderi*

a. Sources:
Harthill, M.P., D.M. Long and B.D. Mishler. 1979. Preliminary list of Southern California Mosses. In theBryologist 82 (2).
Mishler, B.D. 1978. The Mosses of the Channel Islands, California. Madrofio 21: 435-438.

Table E-2. Mosses and lichens on San Nicolas Island (Smith 1993) (Continued).

Ramalina canariensis	*Vermilacinia procera*
Ramalina farinacea	*Verrucaria calciseda*
Ramalina fastigata	*Xanthoria candelaria*
Ramalina lacera	*Xanthoria polycarpa*
Ramalina leptocarpha	*Xanthoria ramulosa*
Ramalina menziesii	*Xanthoria tenax*
Ramalina pollinaria	

a. Sources:
Harthill, M.P., D.M. Long and B.D. Mishler. 1979. Preliminary list of Southern California Mosses. In theBryologist 82 (2).
Mishler, B.D. 1978. The Mosses of the Channel Islands, California. Madrofio 21: 435-438.

E.2 Invertebrates

Terrestrial - Snails

Table E-3. Snails of San Nicolas Island (Smith 1993) .

Scientific Name	Common Name
Binneya notabilis	Santa Barbara shelled slug
Haplotrema duranti	Durant's island snail
Micrarionta feralis	San Nicolas island snail
Micrarionta gabbii	San Clemente island snail
Micrarionta opuntia	pricklypear island snail
Sterkia clementina	San Clemente Island blunt-top snail
Vertigo californica	California vertigo snail
Xerarionta tryoni	Tryon's island snail
Succinea sp.	succine island snail
Micrarionta micromphala	
Micrarionta sodalis	
Rumina decollata	
Helix aspersa	common garden snail

Terrestrial - Insects, Spiders and Related Animals[1]

Table E-4. Insects, Spiders and Related Animals .

ARACHNIDA	
Araneida	
Agelenidae (funnel-web spiders)	
Rualena alleni	Chamberlin & Ivie 1942 (probable SNI endemic)
Araneidae (orb-weaver spiders)	
Metepeira gosoga	Chamberlin & Ivie 1935
Ghaphosidae	
Drassyllus insularis	(Banks) 1900
Gnaphosa maritima	Platnick & Shadab 1975
Haplodrassus signifer	(Koch) Platnick 1984
Sergiolus montanus	(Emerton) 1890
Lycosidae (wolf spiders)	
Pardosa sternalis	(Thorell) 1877 (thin-legged wolf spider)
Micryphantidae (dwarf spiders) (e.g. Erigonidae)	
Erigone sp.	Cockerell 1940
Salticidae (jumping spiders)	
Dendryphantes sp.	Cockerell 1940
Therdiidae (comb-footed spiders)	
Latrodectus hesperus	Chamberlin & Ivie 1935 (western widow)
Steatoda grossa	(Koch) 1838

1. The species listed under Insects, Spiders, and Related Animals is from the 2006-2010 INRMP for San Nicolas Island (USDON 2005), Appendix 6, compiled by Grace Smith, Ecologist, Environmental Division, NAWS Point Mugu, CA in 1993 (Smith 1993).

Table E-4. Insects, Spiders and Related Animals (Continued).

Steatoda medialis	(Banks) 1898
Steatoda washona	Gertsch 1960
Thomisidae (crab spiders)	
Ebo pepinensis	Gertsch 1933
Xysticus montanensis	Keyserling 1887
Zodariidae (zodariid spiders)	
Lutica nicolasia	Gertsch 1961 (endemic SNI) (SNI lutica spider)
PSEUDOSCORPIONIDA	
Garypidae	
Garypus californicus	Banks 1909
CHILOPODA (CENTIPEDES)	
Geophilomorpha	
Geophilidae (earth-loving centipedes)	
Geophilus nicolanus	Chamberlin 1940 (probable SNI endemic)
INSECTA	
Coleoptera (beetles)	
Bostrichidae (branch-boring beetles)	
Scobicia declivis	(LeConte) 1857 (short-circuit beetle)
Carabidae (ground beetles)	
Amara sp.	(*A. insularis* Horn 1875, needs revision)
Bembidion indistinctum	Dejean
Calosoma semilaeve	LeConte 1851 (caterpillar-hunter)
Cicindelidae (tiger beetles)	
Cicindela oregona	LeConte
Cicindela haemorrhagica	LeConte
Coccinellidae (ladybird beetles)	
Coccinella californica	Mannerheim 1943
Coccinella johnsoni	Casey 1908
Hippodamia quinquesignata	Kirby
Nephus guttulatus	(LeConte)
Nephus sordidus	(Horn)
Psyllobora vigintimaculata	Say
Curculionidae (snout beetles)	
Hypera brunneipennis	(Boheman) (clover weevil)
Listroderes costirostris obliquus	(Klug) (probably)
Paragoges maculatus	LeConte
Trigonoscuta nicolana	Pierce 1975 (SNI dune weevil)
Dermestidae (skin beetles)	
Dermestes caninus mannerheimerii	LeConte 1854
Dermestes marmoratus	Say 1823
Elateridae (click beetles)	
Anchastus cinereipennis	(Eschscholtz) 1829
	perhaps one other undetermined species
Histeridae (hister beetles)	
Hypocaccus sp.	(known only from larva)
Neopachylopus sulcifrons	(Mannerheim)
Saprinus lucidulus	LeConte
Saprinus lugens	Erichson 1834
Lathridiidae	
Cortilena casta	(Fall) 1899
Meloidae	
Meloe barbarus	LeConte 1861
Melyridae (soft-winged flower beetles)	
Collops crusoe	Fall 1910
Trichochrous (s.l.) sp.	
Oedemeridae (false blister beetles)	
Copidita quadrimaculata	(Motschulsky) 1852
Phalacridae (shining flower beetles)	
Phalacris sp.	
Scarabaeidae (scarab beetles)	
Coenonycha clementina	Casey 1909
Cyclocephala longula	LeConte 1863
Ligyrus gibbosus	Dejean 1874
Parathyce palpalis	(Horn) 1880
Phobetus comatus	LeConte
	perhaps one or two others undetermined
Staphylinidae (rove beetles)	
Bledius albonotatus	Maklin 1853

Table E-4. Insects, Spiders and Related Animals (Continued).

Bledius fenyesi	Bernhauer & Schubert 1911
Cafius lithocharinus	LeConte 1863
Cafius canescens	(Maklin) 1852
Cafius seminitens	Horn 1884
Funda sulcicollis	(Mannerheim) 1843
Hadrotes crassus	Mannerheim 1846
Tenebrionidae (darkling beetles)	
Apsena grossa	(LeConte) 1866
Coelus globosus	LeConte 1851 (globose dune beetle)
Coelus pacificus	Fall 1897 (pacific dune beetle)
Contiontis sp.	Blaisdell 1921
Eleodes dentipes	Escholtz
Eleodes laticollis apprima	Blaisdell 1921
Eleodes subvestita	(Blaisdell) 1939 (endemic SNI)
Epantius obscurus	LeConte 1851
Helops bachei	LeConte 1861
Helops blaisdelli	Casey 1891 (possible syn. with following)
Helops sp.	Spilman in ed.
Phaleria rotundata	LeConte 1851
Collembola (springtails)	
Entomobryidae	
Entomobrya atrocincta	Schott
Entomobrya multifasciata	
Entomobrya sp.	
Entomobrya unostrigata	Stach
Dermaptera (earwigs)	
Forficulidae (lobe-footed earwigs)	
Forficula auricularia Linnaeus (european earwig)	
Diptera (two-winged flies)	
Anthomyiidae (anthomyid flies)	
Fucellia assimilis	Malloch 1918
Fucellia costalis	Stein 1910
Fucellia pacifica	Malloch 1923
Fucellia separata	Stein 1910
Fucellia thinobia	(Thomson) 1863
Hylemya (Paregle) cinerella	(Fallen) 1825
Asilidae (robber flies)	
Cophura hennei	(Wilcox & Martin) 1945 (endemic SNI) (Henne's robber)
Bombyliidae (bee flies)	
Lepidanthrax angelus	Osten-Sacken
Lepidanthrax borius	Hall
Canaceidae (beach flies)	
Canaceoides nudatus	(Cresson) 1926 (nude beach fly)
Ceratopogonidae (punkies)	
Leptoconops freeborni	Wirth 1952 (freeborn's biting punkie)
Coelopidae (seaweed flies)	
Coelopa vanduzeei	Cresson (seaweed fly)
Culicidae (mosquitoes)	
Culex tarsalis	Coquillett
Culiseta inornata	(Williston)
Ephydridae (shore flies)	
Ilythea spilota	(Curtis) 1832
Parascatella sp.	
Scatella paludum	(Meigen) 1830
Muscidae (muscid flies)	
Fannia sp.	Cockerell 1940 (false house fly)
Piophilidae (skipper flies)	
Piophila casei (Linnaeus)	1758 (cheese skipper)
Sphaeroceridae (small dung flies)	
Leptocera johnsoni	Spuler 1925 (johnson's dung fly)
	possibly one other undetermined species
Syrphidae (flower flies)	
Copestylum mexicana	Maquart
Tephritidae (peacock/fruit flies)	
Paroxyna sp. nov.	Foote (SNI peacock fly)
Therevidae (stiletto flies)	
Thereva smithae	Holston and Irwin 2005
Tipulidae (crane flies)	

Table E-4. Insects, Spiders and Related Animals (Continued).

Gonomyia virgata	Doane 1900
Gonomyia sp.	Sanders 1964
Limonia venusta	Bergroth 1888
Tipula sp.	(known only from pupa)
Hemiptera (true bugs)	
Alydidae (broad-headed bugs)	
Alydus tomentosa	Fracker
Lygaeidae (seed bugs)	
Emblethis bicarius	Horvath
Miridae (plant and leaf bugs)	
Lygus hesperus	Knight
Reduviidae (assassin bugs)	
Rasahus biguttatus	(Say)
Homoptera (roof-winged insects)	
Pseudococcidae (mealybugs)	
Chorizococcus abroniae	McKenzie
Ferrisia virgata	
Phenacoccus gossypii	Townsend & Cockerell
Phenacoccus solani	
Puto yuccae	(Colquillett)
Rhizoecus bicirculus	
Rhizoecus gracilis	McKenzie
Scaptococcus sp.	
Spilococcus pressus	
Tridiscus distichlii	Ferris
Hymenoptera (membrane-winged insects)	
Alloxystidae	
Alloxysta sp.	
Anthophoridae	
Anthophora urbana nicolai	Cockerell 1939 (probable SNI endemic)
Diadasia rinconis mimetica	Cockerell 1924
Hypochrotaenia formula	(Viereck)
Braconidae (braconids)	
Apanteles (s.l.) sp.	Cockerell 1940)
Deuterixys sp. nov.	Mason (dist. unknown)
Rogas spp.	(2 different species)
Chalcididae (chalcids)	
Euchalcidia sp.	
Encyrtidae (encyrtids)	
Euryhopalus sp.	
Eulophidae (eulophids)	
Zagrammosoma sp.	
Eumenidae	
Stenodynerus sp.	
Formicidae (ants)	
Aphaenogaster patruelis	Forel 1886
Monomorium minutum	Buckley (aka M. ergatogyra Wheeler)
Halictidae (halictid bees)	
Agapostemon texanus	Cresson 1872 (aka A. californicus Crawford)
Diadasia rinconis mimetica	Cockerell 1924
Dialictus incompletus	(Crawford) 1907
Dialictus megastictum	(Cockerell)
Dialictus nevadensis	(Crawford) 1907
Dialictus perichlarus	(Cockerell) 1937
Dialictus pilosicaudus	(Cockerell) 1937
Evylaeus kindaidii	(Cockerell)
Ichneumonidae (ichneumons)	
Aclastus sp.	
Enicospilus sp.	
Gelis sp.	
Hyposoter sp.	
Netilia sp.	
Ophoin sp.	
Spilichneumon sp.	(near *S. superbus* (Prov.)
Triclistus sp.	
Mymaridae (fairyfly chalcids)	
Gonatocerus sp.	
Polynema sp.	

Table E-4. Insects, Spiders and Related Animals (Continued).

Pteromalidae	
Halticoptera sp.	
Scelionidae	
Idris sp.	
Sphecidae (sphecid wasps)	
*Bembix americana nicolai (*aka *B. hamata nicolai)*	Cockerell 1938 (endemic SNI) (SNI sand wasp)
Mimesa cahuilla	Finnamore 1983
Podalonia mexicana	(Saussure)
	and 8 other species per Menke
Tiphiidae (tiphiid wasps)	
Brachycistis agama	(DellaTorre) 1897
Isoptera (termites)	
undetermined family and sp. at Daytona Beach	
Lepidoptera (butterflies and moths)	
Arctiidae (tiger moths)	
Apantesis proxima	Guerin-Meneville (mexican tiger moth)
Geometridae (geometer moths)	
Euphyia implicata	Guenee
Perizoma custodiata	Guenee
Hesperiidae (skippers)	
Pyrgus albescens	Ploetz (resident) (western checkered skipper)
Lycaenidae (gossamer-winged butterflies)	
Brephidium exilis	(Boisduval) (resident) (western pygmy blue)
Everes amyntula amyntula	(Boisduval) (resident) (western tailed blue)
Plebejus acmon acmon	(West. & Hewit.) (resident) (acmon blue)
Strymon melinus	Huebner (resident) (gray hairstreak)
Noctuidae (noctuid moths)	
Euxoa messoria	(Harris) 1841 (reaper dart)
Lacinipolia strigicollis	(Wallengren) 1860
Pseudaletia unipuncta	(Haworth) (armyworm)
Spodoptera frugiperda	(Abbot & Smith) (fall armyworm)
Trichoclea edwardsi	Smith 1887
Nymphalidae (brush-footed butterflies)	
Vanessa (Cynthia) anabella	(Field) (resident) (west coast lady)
Vanessa (Cynthia) cardui	(Linnaeus) (painted lady)
Vanessa (Cynthia) virginiensis	(Drury) (virginia lady)
Pieridae (whites, sulphurs and orangetips)	
Colias eurytheme Boisduval	(resident) (alfalfa sulphur)
Pieris protodice	Boisduval & LeConte (resident) (checkered white)
Pterophoridae (plume moths) (microleps)	
Anstenoptilia marmarodactyla	(Dyar) 1902
Platyptilia williamsii	Grinnell 1908
Pyralidae (grass moths) (microleps)	
Diastictus fracturalis	(Zeller)
Dicymolomia metalliferalis	(Packard)
Nomophila nearctica	Munroe
Protasia mirabilicornella	(Dyar)
Sphingidae (sphinx moths)	
Hyles lineata	(Fabricius) 1775 (striped morning sphinx)
Tineidae (clothes moths) (microleps)	
Amydria sp.	
Tortricidae (leaf-roller moths) (microleps)	
Argyrotaenia franciscana insulana	Powell 1964 (aka Argrotaenia)
Epiblema strenuana	(Walker)
Neuroptera (nerve-winged insects)	
Myrmeleontidae (antlions)	
Brachynemurus peregrinis	(Hagen) 1861
Orthoptera (straight-winged insects)	
Acrididae (short-horned grasshoppers)	
Camnula pellucida	(Scudder) 1862
Microtes nicolai	Rentz & Weissman 1982 (endemic SNI)
Schistocera nitens nitens	(Thunberg)
Trimerotropis pallidipennis pallidipennis	(Burmeister) 1838
Trimerotropis pseudofasciata	Scudder
Blatellidae (german and wood roaches)	
Blatella germanica	(Linnaeus)
Gryllacrididae (wingless long-horned grasshoppers)	

Table E-4. Insects, Spiders and Related Animals (Continued).

Cnemotettix spinulus	Rentz & Weismann 1973
Pristoceuthophilus marmoratus	Rehn
Gryllidae (crickets)	
Gryllus integer	Scudder 1901
Gryllus lineaticeps	Stal 1858
Thysanura (aka Microcoryphia) (bristletails)	
Machilidae (jumping bristletails)	
Neomachilis sp.	

E.3 Vertebrates

E.3.1 Reptiles

Table E-5. Terrestrial Reptiles.[1]

Species Name	Common Name	Status (if any)
Elgaria multicarinata	southern alligator lizard	
Uta stansburiana elegans	sideblotched lizard	
Xantusia riversiana	island night lizard	FT

FE = Federally Endangered, FT = Federally Threatened, SE = State Endangered, ST = State Threatened, SS = Sensitive Species

1. Sources: G. Smith, pers. comm, 2010.

E.3.2 Birds

ABUNDANCE AND SEASONAL OCCURRENCE

a - Abundant 100+/day	E Extirpated	a – Autumn
c – Common 25-100/day	P Perennial Visitor	s – Spring
u – Uncommon 1-24/day	R Resident	* - Confirmed Breeder
r – Rare 1-10/year	S Summer Visitor	? – Suspected Breeder
	T Transient	
x – extremely rare, of casual or accidental occurrence	W Winter Visitor	

Table E-6. Checklist of the Birds of San Nicolas Island[1] *.*

Scientific Name	Common Name	Status
ANATIDAE (DUCKS, GEESE AND SWANS)		
Anser albifrons	greater white-fronted goose	xT, xW
Chen caerulescens	snow goose	xW
Branta bernicla	brant	rTs, xTa
Branta canadensis	Canada goose	xW
Cygnus columbianus	tundra swan	xW
Anas strepera	gadwall	xTa
Anas penelope	Eurasian wigeon	xTa
Anas americana	American wigeon	xTa
Anas platyrhynchos	mallard	xTa
Anas discors	blue-winged teal	xTa
Anas cyanoptera	cinnamon teal	rW
Anas clypeata	northern shoveler	rT
Anas acuta	northern pintail	rW, rT
Anas crecca	green-winged teal	rW, rT
Aythya collaris	ring-necked duck	xTa
Aythya marila	greater scaup	xTa
Aythya affinis	lesser scaup	rW
Melanitta perspicillata	surf scoter	cW

Table E-6. Checklist of the Birds of San Nicolas Island[1] (Continued).

Scientific Name	Common Name	Status
Melanitta fusca	white-winged scoter	xTs
Mergus serrator	red-breasted merganser	uW
Oxyura jamaicensis	ruddy duck	rW
GAVIIDAE (LOONS)		
Gavia stellata	red-throated loon	rW
Gavia pacifica	Pacific loon	uW, xS
Gavia immer	common loon	uW, xS
PODICIPEDIDAE (GREBES)		
Podilymbus podiceps	pied-billed grebe	xT
Podiceps auritus	horned grebe	xT
Podiceps nigricollis	eared grebe	uW
Aechmophorus occidentalis	western grebe	cW, rS
Aechmophorus clarkii	Clark's grebe	xTa
DIOMEDEIDAE (ALBATROSSES)		
Phoebastria immutabilis	Laysan albatross	xTs
PROCELLARIIDAE (SHEARWATERS AND PETRELS)		
Fulmarus glacialis	northern fulmar	uW
Pterodroma ultima	Murphy's petrel	xTs
Puffinus creatopus	pink-footed shearwater	cS
Puffinus bulleri	Buller's shearwater	xTa
Puffinus griseus	sooty shearwater	aTs, rS, cTa
Puffinus opisthomelas	black-vented shearwater	xTa
HYDROBATIDAE (STORM-PETRELS)		
Oceanodroma leucorhoa	Leach's storm-petrel	xTa
Oceanodroma homochroa	ashy storm-petrel	xTa
Oceanodroma melania	black storm-petrel	xTa
PHAETHONTIDAE (TROPICBIRDS)		
Phaethon aethereus	red-billed tropicbird	xTa
SULIDAE (BOOBIES)		
Sula dactylatra	masked booby	xT
PHALACROCORACIDAE (CORMORANTS)		
Phalacrocorax penicillatus	Brandt's cormorant	aR*
Phalacrocorax auritus	double-crested cormorant	uR
Phalacrocorax pelagicus	Pelagic cormorant	uR*
PELECANIDAE (PELICANS)		
Pelecanus occidentalis	brown pelican	aR, E*
ARDEIDAE (HERONS, BITTERNS AND ALLIES)		
Botaurus lentiginosus	American bittem	xTa
Ardea herodias	great blue heron	uW
Ardea alba	great egret	xTa
Egretta thula	snowy egret	xT, xW
Bubulcus ibis	cattle egret	xP
Butorides virescens	green heron	xTa
Nycticorox nycticorox	black-crowned night-heron	xTa
THRESKIORNITHIDAE (IBISES AND SPOONBILLS)		
Plegadis chihi	white-faced ibis	xTa
CATHARTIDAE (NEW WORLD VULTURES)		
Cathartes aura	turkey vulture	xTs
PANDIONIDAE (OSPREY)		
Pandion haliaetus	osprey	xTa
ACCIPITRIDAE (HAWKS, KITES, AND EAGLES)		
Elanus leucurus	white-tailed kite	xTa
Haliaeetus leucocephalus	bald eagle	E*
Circus cyaneus	northem harrier	uW
Accipiter striatus	sharp-shinned hawk	rT
Accipiter cooperii	Cooper's hawk	rW
Buteo jamaicensis	red-tailed hawk	xT, xW
FALCONIDAE (CARACARAS AND FALCONS)		
Falco sparverius	American kestrel	cR*
Falco columbarius	merlin	rW
Falco peregrinus	peregrine falcon	uW
Falco mexicanus	prairie falcon	xTa
RALLIDAE (RAILS, GALLINULES AND COOTS)		
Rallus limicola	Virginia rail	rT
Porzana carolina	sora	rT
Fulica americana	American coot	rW
GRUIDAE (CRANES)		

Table E-6. Checklist of the Birds of San Nicolas Island[1] (Continued).

Scientific Name	Common Name	Status
Grus canadensis	sandhill crane	xW
CHARADRIINAE (LAPWINGS AND PLOVERS)		
Pluvialis squatarola	black-bellied plover	cW, rS
Pluvialis fulva	Pacific golden-plover	uW
Charadrius alexandrinus	snowy plover	cR*
Charadrius semipalmatus	semipalmated plover	uTas
Charadrius vociferus	killdeer	uR*
Charadrius montanus	mountain plover	xW
HAEMATOPODIDAE (OYSTERCATCHERS)		
Haematopus palliatus	American oystercatcher	rR?
Haematopus bachmani	black oystercatcher	uR*
RECURVIROSTRIDAE (STILTS AND AVOCETS)		
Himantopus mexicanus	black-necked btilt	rT
Recurvirostra americana	American avocet	xTas
SCOLOPACIDAE (SANDPIPERS, PHALAROPES, AND ALLIES)		
Actitis macularius	spotted sandpiper	rW
Tringa incana	wandering tattler	uW, rS
Tringa melanoleuca	greater yellowlegs	rTa, xTs
Tringa semipalmata	willet	cW, rS
Tringa flavipes	lesser yellowlegs	rTa, xTs
Tringa solitaria	solitary sandpiper	xTa
Numenius phaeopus	whimbrel	uW, rS
Numenius americanus	long-billed curlew	rW
Limosa haemastica	Hudsonian godwit	xTa
Limosa fedoa	marbled godwit	cW, uS
Arenaria interpres	ruddy turnstone	uW, rS
Arenaria melanocephala	black turnstone	cW, uS
Aphriza virgata	surfbird	uW, rS
Calidris canutus	red knot	xTa
Calidris alba	sanderling	cT, uW
Calidris pusilla	semipalmated sandpiper	xTa
Calidris mauri	western sandpiper	cTa, uW
Calidris minutilla	least sandpiper	cTa, uW
Calidris bairdii	Baird's sandpiper	rTa
Calidris melanotos	pectoral sandpiper	rTa
Calidris alpina	dunlin	rT
Tryngites subruficollis	buff-breasted sandpiper	xTa
Philomachus pugnax	ruff	xTa
Limnodromus griseus	short-billed dowitcher	rTa, xTs
Limnodromus scolopaceus	long-billed dowitcher	uTa
Gallinago gallinago	common snipe	rT
Phalaropus tricolor	Wilson's phalarope	rTa, xTs
Phalaropus lobatus	red-necked phalarope	rT
Phalaropus fulicaria	red phalarope	xTas
LARIDAE (GULLS, TERNS AND SKIMMERS)		
Rissa tridactyla	black-legged kittiwake	uW
Chroicocephalus philadelphia	Bonaparte's gull	rW
Larus atricilla	laughing gull	xT
Larus heermanni	Heerman's gull	aW, rS
Larus canus	mew gull	rW
Larus delawarensis	ring-billed gull	xTa
Larus occidentalis	westem gull	aR*
Larus californicus	California gull	cW
Larus argentatus	herring gull	uW
Larus thayeri	Thayer's gull	rW
Larus glaucescens	glaucous-winged gull	uW, rS
Larus hyperboreus	glaucous gull	xW
Hydroprogne caspia	Caspian tern	xT
Sterna forsteri	Forster's tern	xTs
Thalasseus maximus	royal tern	cW, uS
Thalasseus elegans	elegant tern	xT
Rynchops niger	black skimmer	xT
STERCORARIIDAE (SKUAS AND JAEGERS)		
Catharacta maccormicki	south polar skua	xTa
Stercorarius pomarimus	pomarine jaeger	rW
Stercorarius parasiticus	parasitic jaeger	rW
ALCIDAE (AUKS, MURRES AND PUFFINS)		

Table E-6. Checklist of the Birds of San Nicolas Island[1] (Continued).

Scientific Name	Common Name	Status
Uria aalge	common murre	xW
Cepphus columba	pigeon guillemot	uTa, rP
Synthliboramphus hypoleucus	Xantus's murrelet	xP
Ptychoramphus aleuticus	Cassin's auklet	rR
Aethia psittacula	parakeet auklet	xW
Cerorhinca monocerata	rhinoceros auklet	rR
Fratercula cirrhata	tufted puffin	xTs
COLUMBIDAE (PIGEONS AND DOVES)		
Patagioenas fasciata	band-tailed pigeon	rS
Zenaida asiatica	white-winged dove	rTs
Zenaida macroura	mourning dove	uTa
CUCULIDAE (CUCKOOS, ROADRUNNERS AND ANIS)		
Coccyzus erythropthalmus	black-billed cuckoo	xTa
Coccyzus americanus	yellow-billed cuckoo	xTa
TYTONIDAE (BARN OWLS)		
Tyto alba	barn owl	uR*
STRIGIDAE (TYPICAL OWLS)		
Athene cunicularia	burrowing owl	uW
Asio otus	long-eared owl	xTa
Asio flammeus	short-eared owl	xT
CAPRIMULGIDAE (GOATSUCKERS)		
Chordeiles acutipennis	lesser nighthawk	xTs
Phalaenoptilus nuttallii	common poorwill	xTa
APODIDAE (SWIFTS)		
Cypseloides niger	black swift	xTs
Chaetura pelagica	chimney swift	xTs
Chaetura vauxi	Vaux's swift	xTa
Aeronautes saxatalis	white-throated swift	xTs
TROCHILIDAE (HUMMINGBIRDS)		
Archilochus alexandri	black-chinned hummingbird	xTa
Calypte anna	Anna's hummingbird	uW, rS
Calypte costae	Costa's hummingbird	xTsa
Selasphorus rufus	rufous hummingbird	rTs, xTa
Selasphorus sasin	Allen's hummingbird	rTs, xTa
ALCEDINIDAE (KINGFISHERS)		
Megaceryle alcyon	belted kingfisher	rW
PICIDAE (WOODPECKERS)		
Melanerpes lewis	Lewis's woodpecker	xTa
Melanerpes formicivorus	acorn woodpecker	xT
Sphyrapicus nuchalis	red-naped sapsucker	xTa
Sphyrapicus ruber	red-breasted sapsucker	xTa
Colaptes auratus	northern flicker	uW
TYRANNIDAE (TYRANT FLYCATCHERS)		
Contopus cooperi	olive-sided flycatcher	rT
Contopus sordidulus	western wood-pewee	rt
Empidonax flaviventris	yellow-bellied flycatcher	xTa
Empidonax traillii	willow flycatcher	rT
Empidonax minimus	least flycatcher	xTa
Empidonax hammondii	hammond's flycatcher	rT
Emipidonax wrightii	gray flycatcher	rT
Empidonax oberholseri	dusky flycatcher	xT
Empidonax difficilis	Pacific-slope flycatcher	cTa
Sayornis nigricans	black phoebe	uW
Sayornis phoebe	eastem phoebe	xTa
Sayornis saya	Say's phoebe	cW
Pyrocephalus rubinus	vermilion flycatcher	xTa
Myiarchus cinerascens	ash-throated flycatcher	xT
Tyrannus melancholicus	tropical kingbird	xTa
Tyrannus vociferans	Cassin's kingbird	xTa
Tyrannus verticalis	westem kingbird	cT
Tyrannus tyrannus	eastem kingbird	rT
Tyrannus forficatus	scissor-tailed flycatcher	xT
LANIIDAE (SHRIKES)		
Lanius ludovicianus	loggerhead shrike	rW
VIREONIDAE (VIREOS)		
Vireo bellii	Bell's vireo	xTs
Vireo cassinii	Cassin's vireo	rT

Table E-6. Checklist of the Birds of San Nicolas Island[1] (Continued).

Scientific Name	Common Name	Status
Vireo huttoni	Hutton's vireo	rT
Vireo gilvus	warbling vireo	cT
Vireo olivaceus	red-eyed vireo	xTs
CORVIDAE (CROWS AND JAYS)		
Corvus corax	common raven	E*, xT
ALAUDIDAE (LARKS)		
Eremophila alpestris	homed lark	aR*
HIRUNDINIDAE (MARTINS AND SWALLOWS)		
Progne subis	purple martin	xTa
Tachycineta bicolor	tree swallow	rT
Tachycineta thalassina	violet-green swallow	rT
Stelgidopteryx serripennis	northern rough-winged swallow	rT
Riparia riparia	bank swallow	xT
Petrochelidon pyrrhonota	cliff swallow	rT
Hirundo rustica	barn swallow	rS*, rT
SITTIDAE (NUTHATCHES)		
Sitta canadensis	red-breasted nuthatch	rT
Sitta pygmaea	pygmy nuthatch	xTs
CERTHIIDAE (CREEPERS)		
Certhia americana	brown creeper	rT
TROGLODYTIDAE (WRENS)		
Salpinctes obsoletus	rock wren	cR*
Thryomanes bewickii	Bewick's wren	rT
Troglodytes aedon	house wren	uW, uT
Troglodytes pacificus	Pacific wren	rW, rT
Cistothorus palustris	marsh wren	rW, rT
POLIOPTILIDAE (GNATCATCHERS)		
Polioptila caerulea	clue-gray gnatcatcher	rT
REGULIDAE (KINGLETS)		
Regulus satrapa	golden-crowned kinglet	xTa
Regulus calendula	ruby-crowned kinglet	cT, uW
TURDIDAE (SOLITAIRES, THRUSHES AND ALLIES)		
Sialia currucoides	mountain bluebird	rW
Myadestes townsendi	Townsend's solitaire	rTa, xTs
Catharus ustulatus cT	Swainson's thrush	
Catharus guttatus	hermit thrush	cT, uW
Turdus migratorius	American robin	uT
Ixoreus naevius	varied thrush	uT, rW
MIMIDAE (MOCKINGBIRDS, THRASHERS AND ALLIES)		
Dumetella carolinensis	gray catbird	xTa
Mimus polyglottos	northern mockingbird	cR*
Oreoscoptes montanus	sage thrasher	rT, rW
Toxostoma rufum	brown thrasher	xT
Toxostoma bendirei	Bendire's thrasher	xTa
MOTACILLIDAE (WAGTAILS AND PIPITS)		
Anthus cervinus	red-throated pipit	xTa
Anthus rubescens	American pipit	uW
BOMBYCILLIDAE (WAXWINGS)		
Bombycilla cedrorum	cedar waxwing	cT
PTILOGONATIDAE (SILKY-FLYCATCHERS)		
Phainopepla nitens	phainopepla	uT
CALCARIIDAE (LONGSPURS)		
Calcarius lapponicus	Lapland longspur	rTa
Calcarius ornatus	chestnut-collared longspur	xTa
PARULIDAE (WOOD WARBLERS)		
Vermivora chrysoptera	golden-winged warbler	xTs
Oreothlypis peregrina	Tennessee warbler	xT
Oreothlypis celata	orange-crowned warbler	aS*, cT, uW
Oreothlypis ruficapilla	Nashville warbler	rT
Oreothlypis virginiae	Virginia's warbler	xT
Oreothlypis luciae	Lucy's warbler	xT
Parula americana	northern parula	xTs
Dendroica petechia	yellow warbler	cT
Dendroica pensylvanica	chestnut-sided warbler	xTa
Dendroica magnolia	magnolia warbler	xT
Dendroica tigrina	Cape May warbler	xT
Dendroica caerulescens	black-throated blue warbler	xTas

Table E-6. Checklist of the Birds of San Nicolas Island[1] (Continued).

Scientific Name	Common Name	Status
Dendroica coronata	yellow-rumped warbler	cT, uW
Dendroica nigrescens	black-throated gray warbler	rT
Dendroica virens	black-throated green warbler	xT
Dendroica townsendi	Townsend's warbler	uT, rw
Dendroica occidentalis	hermit warbler	uT
Dendroica fusca	Blackburnian warbler	xTas
Dendroica dominica	yellow-throated warbler	xTa
Dendroica discolor	prairie warbler	xTa
Dendroica palmarum	palm warbler	uT, rW
Dendroica castanea	bay-breasted warbler	xT
Dendroica striata	Blackpoll warbler	rTa
Mniotilta varia	black-and-white warbler	rT
Setophaga ruticilla	American redstart	uT
Protonotaria citrea	prothonotary warbler	xTs
Helmitheros vermivorum	worm-eating warbler	xTs
Seiurus aurocapilla	ovenbird	rT
Parkesia noveboracensis	northern waterthrush	rTa, xTs
Oporornis agilis	Connecticut warbler	xTa
Oporornis philadelphia	mourning warbler	xTa
Oporonis tolmiei	MacGillivray's warbler	uT
Geothlypis trichas	common yellowthroat	cT, uW
Wilsonia citrina	hooded warbler	xT
Wilsonia pusilla	Wilson's warbler	cT
Myioborus pictus	painted redstart	xTa
Icteria virens	yellow-breasted chat	uTa, rTs
EMBERIZIDAE (TOWHEES, SPARROWS, AND JUNCOS)		
Pipilo chlorurus	green-tailed towhee	rT
Pilpilo maculatus	spotted towhee	uT, rW
Spizella passerina	chipping sparrow	cT
Spizella pallida	clay-colored sparrow	rTa, xTs
Spizella breweri	Brewer's sparrow	rT
Spizella atrogularis	black-chinned sparrow	xTa
Pooecetes gramineus	Vesper sparrow	rT
Chondestes grammacus	lark sparrow	uT
Amphispiza bilineata	black-throated sparrow	xTa
Calamospiza melanocorys	lark Bunting	rTa
Passerculus sandwichensis	savannah sparrow	cTa, uW
Ammodramus savannarum	grasshopper sparrow	xT
Passerella iliaca	fox sparrow	uT, uW
Melospiza melodia	song sparrow	rT
Melospiza lincolnii	Lincoln's sparrow	cW
Zonotrichia albicollis	white-throated sparrow	rTa, xTs
Zonotrichia querula	Harris's sparrow	rW
Zonotrichia leucophrys	white-crowned sparrow	aW
Zonotrichia atricapilla	golden-crowned sparrow	cW
Junco hyemalis	dark-eyed junco	uT, rW
CARDINALIDAE (GROSBEAKS, BUNTINGS AND ALLIES)		
Piranga rubra	summer tanager	xT
Piranga olivacea	scarlet tanager	xT
Piranga ludoviciana	western tanager	cT
Pheucticus ludovicianus	rose-breasted grosbeak	rT
Pheucticus melanocephalus	black-headed grosbeak	cT
Passerina caerulea	blue grosbeak	uT
Passerina amoena	lazuli bunting	cT
Passerina cyanea	indigo bunting	rT
Spiza americana	dickcissel	rTa
ICTERIDAE (BLACKBIRDS, ORIOLES AND ALLIES)		
Dolichonyx oryzivorus	bobolink	uTa, xTs
Agelaius phoeniceus	red-winged blackbird	uW
Agelaius tricolor	tricolored blackbird	xTa
Sturnella neglecta	western meadowlark	aR*
Xanthocephalus xanthocephalus	yellow-headed blackbird	uT
Euphagus carolinus	rusty blackbird	xTa
Euphagus cyanocephalus	Brewer's blackbird	cT, uW
Molothrus ater	brown-headed cowbird	cTf, uW, uTs
Icterus spurius	orchard oriole	xTa
Icterus cucullatus	hooded oriole	uT

Table E-6. Checklist of the Birds of San Nicolas Island[1] (Continued).

Scientific Name	Common Name	Status
Icterus bullockii	Bullock's oriole	cT
Icterus galbula	Baltimore oriole	rT
Icterus parisorum	Scott's oriole	rTa
FRINGILLIDAE (FINCHES AND ALLIES)		
Carpodacus purpureus	purple finch	rT
Carpodacus cassinii	Cassin's finch	rT
Carpodacus mexicanus	house finch	aR*
Loxia curvirostra	red crossbill	xTa
Spinus pinus	pine siskin	rTa, xTs
Spinus psaltria	lesser goldfinch	uT, xW
Spinus lawrencei	Lawrence's goldfinch	rT
Spinus tristis	American goldfinch	xT
Coccothraustes vespertinus	evening grosbeak	xT
NON-NATIVE SPECIES		
Alectoris chukar	chukar	aR*
Phasianus colchicus	ring-necked pheasant	E
Callipepla californica	California quail	E
Columba livia	rock dove	uT
Sturnus vulgaris	European starling	aR*
Passer domesticus	house sparrow	uR*

1. This checklist was compiled by the Santa Barbara Museum of Natural History in 2000 and was appended to the 2006-2010 INRMP for San Nicolas Island (USDON 2005).

E.3.3 Mammals

Table E-7. Terrestrial Mammals.[1]

Species Name	Common Name	Status (if any)
Urocyon littoralis dickeyi	San Nicolas Island fox	ST
Peromyscus maniculatus exterus	San Nicolas Island deer mouse	SS

FE = Federally Endangered, FT = Federally Threatened,
SE = State Endangered, ST = State Threatened, SS = Sensitive Species

1. Sources: G. Smith, pers. comm, 2010.

E.4 Conspicuous Marine Species

It is important to note that marine species lists should not be considered complete listings of all species present in an area. The marine environment is highly dynamic and individual animals may move over great distances. Additionally, surveys of marine species are limited in their ability to detect and document species due to the complex nature of the environment and methodological limitations. The following should be considered lists of relatively abundant or conspicuous species. Cryptic, sparse, or otherwise difficult to identify species may not be represented.

Table E-8. Marine Plants and Algae.[1]

Species Name	Common Name	Status (if any)
Acrosorium ciliolatum	red algae	
Bossiella spp.	coralline algae	
Botryocladia pseudodichotoma	red algae	
Bryopsis spp.	hair algae	
Calliarthron spp.	coralline algae	
Callithamnion rupicola	red algae	
Callophyllis spp.	red algae	
Caulacanthus ustulatus	red algae	
Centroceras spp.	red algae	
Ceramium spp.	red algae	
Chaetomorpha spiralis	chaetomorpha algae	

Table E-8. Marine Plants and Algae.[1]

Species Name	Common Name	Status (if any)
Chondracanthus canaliculatus	gigartina red algae	
Chondracanthus spinosus	gigartina red algae	
Chondria acrorhizophora	red algae	
Chondria decipiens	red algae	
Chondria spp.	red algae	
Cladophora columbiana	green tuft algae	
Codium fragile	dead man's fingers	
Codium setchellii	green algae	
Colpomenia spp.	brown algae	
Corallina spp.	coraline algae	
Corallophila spp.	red algae	
Cryptopleura spp.	red algae	
Cyanobacteria	bluegreen algae	
Cystoseira osmundacea	woody chain bladder algae	
Dasya binghamiae	red algae	
Dasya californica	red algae	
Dasya sinicola	red algae	
Desmarestia ligulata	brown algae	
Dictyopteris undulata	brown algae	
Dictyota spp.	brown algae	
Egregia menziesii	feather boa kelp	
Eisenia arborea	southern sea palm	
Endarachne binghamiae	brown algae	
Endocladia muricata	rock weed	
Erythroglossum californicum	red algae	
Farlowia spp.	red algae	
Fucus spp.	brown algae	
Gastroclonium parvum	green algae	
Gastroclonium subarticulatum	red algae	
Gelidiaceae spp.	red algae	
Gelidium coulteri	red algae	
Gelidium nudifrons	red algae	
Gelidium purpurascens	red algae	
Gelidium pusillum	red algae	
Gelidium robustum	red algae	
Gelidium spp.	red algae	
Gracilariopsis andersonii	red algae	
Gracilariopsis papenfussii	red algae	
Halidrys dioica	brown algae	
Haliptylon gracile	red algae	
Herposiphonia littoralis	red algae	
Herposiphonia spp.	red algae	
Herposiphonia verticillata	red algae	
Hesperophycus harveyanus	green algae	
Hildenbrandia spp.	red algae	
Hymenena spp.	red algae	
Hypnea valentiae	red algae	
Jania crassa	red algae	
Jania tenella	red algae	
Laminaria farlowii	laminaria kelp	
Laminaria setchellii	laminaria kelp	
Laurencia decidua	red algae	
Laurencia masonii	red algae	
Laurencia pacifica	red algae	
Laurencia snyderae	red algae	
Laurencia spp.	red algae	
Leathesia spp.	sea potato, brown algae	
Lithothamnion spp.	red algae	
Lithophyllum spp.	red algae	
Lithothrix aspergillum	coraline algae	
Lomentaria hakodatensis	brown algae	
Lomentaria spp.	brown algae	
Macrocystis pyrifera	giant kelp	
Macrocystis spp.	kelp	
Mastocarpus papillatus	rock weed	
Mazzaella affinis	red algae	
Mazzaella leptorhynchos	red algae	

Table E-8. Marine Plants and Algae.[1]

Species Name	Common Name	Status (if any)
Mazzaella linearis	red algae	
Nemalion helminthoides	sea noodles algae	
Nienburgia andersoniana	red algae	
Osmundea sinicola	red algae	
Osmundea spectabilis	sea laurel algae	
Pachydictyon coriaceum	brown algae	
Pelvetiopsis spp.	green algae	
Petalonia fascia	brown algae	
Petrocelis spp.	red algae	
Petrospongium rugosum	brown algae	
Peyssonnelia spp.	crustose coraline algae	
Phaeophyceae	brown algae	
Phycodrys setchellii	red algae	
Phyllospadix scouleri	Scouler's surfgrass	
Phyllospadix sp.	surfgrass	
Phyllospadix torreyi	Torrey's surfgrass	
Pikea spp.	red algae	
Plocamium cartilagineum	red algae	
Plocamium pacificum	red algae	
Plocamium violaceum	red algae	
Pogonophorella californica	red algae	
Polysiphonia spp.	red algae	
Porphyra spp.	red algae	
Prionitis lanceolata	red algae	
Prionitis linearis	red algae	
Prionitis spp.	red algae	
Pseudolithoderma nigra	red algae	
Pseudolithoderma nigrum (previously nigra)	green algae	
Pterocladiella capillacea	red algae	
Pterosiphonia baileyi	red algae	
Pterosiphonia bipinnata	black tassel	
Pterosiphonia dendroidea	red algae	
Pterosiphonia pennata	red algae	
Pterothamnion spp.	red algae	
Pterygophora californica	palm kelp	
Ralfsiaceae	brown algae	
Rhodoglossum spp.	red algae	
Rhodymenia californica	red algae	
Rhodymenia pacifica	red algae	
Sargassum agardhianum	brown algae	
Sargassum muticum	brown algae	
Scytosiphon spp.	brown algae	
Silvetia compressa	brown algae	
Sorella delicatula	red algae	
Tiffaniella snyderiae	red algae	
Ulva spp.	sea lettuce	
Zonaria farlowii	red algae	

1. Sources:

Daniel Pondella, Vantuna Research Group, subtidal surveys conducted as part of the Southern California Coastal Water Research Project's BIGHT '08 program (2008-2009).

Pete Raimondi, UCSC, PISCO intertidal surveys conducted as part of the ASBS storm water exemption package.

Merkel & Associates, Inc, Naval Base Ventura County, San Nicolas Island Area of Special Biological Significance Biological Survey Report (2007)

Table E-9. Marine Invertebrates.[1]

Species Name	Common Name	Status (if any)
Acanthinucella spp.	sea snails	
Alia spp.	sea snail	
Amphissa versicolor	sea snail	
Anemone	unspecified anemones	
Anisodoris nobilis	sea lemon nudibranch	
Anthopleura artemisia	burrowing anemone	
Anthopleura elegantissima	aggregating anemone or colonial anemone	
Anthopleura sola	starburst anemone	

Table E-9. Marine Invertebrates.[1]

Species Name	Common Name	Status (if any)
Anthopleura xanthogrammica	giant green anemone	
Aplidium californicum	sea pork tunicate	
Aplidium solidum	sea pork tunicate	
Aplysia californica	California sea slug or sea hare	
Asterina miniata	bat star	
Astrangia lajollensis	cup coral	
Balanophyllia elegans	orange cup coral	
Balanus glandula	acorn barnacle	
Bittium eschrichtii	sea snail	
Blepharipoda occidentalis	sand crabs	
Brachidontes spp.	mussels	
Bryozoans	moss animals	
Bugula neritina	bryozoan	
Cancer spp.	rock crabs	
Ceratostoma foliatum	sea snail	
Ceratostoma nuttalli	sea snail	
Chaetopterus variopedatus	parchment worm	
Chthamalus spp.	barnacle	
Clavelina huntsmani	lighbulb tunicate	
Coenocyathus bowersi	colonial cup coral	
Conus californicus	California cone	
Coralliophila spp.	sea snails	
Corynactis californica	strawberry anemone	
Crassedoma giganteum	rock scallop	
Cucumaria miniata	sea cucumber	
Cucumaria piperata	sea cucumber	
Cucumaria pseudocurata	sea cucumber	
Cyanoplax hartwegii (previously lepidochitona)	Hartweg's chiton	
Cyanoplax spp.	chitons	
Cypraea spadicea	chestnut cowrie	
Dendraster excentricus	sand dollars	
Dendropoma lituella	flat wormsnail	
Dermasterias imbricata	leather star	
Didemnum spp.	colonial tunicate	
Diopatra spp.	tube worm	
Disporella separata	purple encrusting bryozoan	
Distaplia occidentalis	colonial tunicate	
Dodecaceria fewkesi	colonial tubeworm	
Dodecaceria spp.	tube worm	
Emerita analoga	sand crabs	
Epiactis prolifera	brooding anemone	
Euzonus mucronata	bloodworms	
Excirolana chiltoni	isopods	
Fissurella volcano	volcano keyhole limpet	
Flabellina iodinea	spanish shawl nudibranch	
Haliclona spp.	purple encrusting sponges	
Haliotis corrugata	pink abalone	
Haliotis cracherodii	black abalone	Endangered
Haliotis fulgens	green abalone	
Haliotis kamtschatkana assimilis	pinto/threaded abalone	
Haliotis rufescens	red abalone	
Haliotis sorenseni	white abalone	Endangered
Henricia leviuscula	Pacific blood star	
Hermissenda crassicornis	opalescent nudibranch	
Homalopoma baculum	berry dwarf turban snail	
Homalopoma luridum	dark dwarf turban snail	
Hydroid	hydroid	
Hymenamphiastra cyanocrypta	cobalt sponge	
Kelletia kelletii	Kellet's whelk	
Lacuna marmorata	sea snail	
Lepidochitona dentiens	chiton	
Leptasterias spp.	sea star	
Leucilla nuttingi	smooth urn sponge	
Linckia columbianus	sea star	
Lirularia spp.	sea snail	
Lithopoma gibberosum	red turban snail	
Littorina keenae	sea snail, periwinkle	

Table E-9. Marine Invertebrates.[1]

Species Name	Common Name	Status (if any)
Littorina plena	sea snail, periwinkle	
Littorina scutulata	sea snail, periwinkle	
Loligo opalescens	Market squid	
Lophogorgia chilensis	red gorgonian	
Lottia austrodigitalis	southern finger limpet	
Lottia conus	limpet	
Lottia digitalis	California fingered limpet	
Lottia gigantea	owl limplet	
Lottia limatula	file limpet	
Lottia ochracea	yellow limpet	
Lottia paradigitalis	limpet	
Lottia pelta	shield limpet	
Lottia scabra	California rough limpet	
Lottia scutum	Pacific plate limpet	
Lottia strigatella	limpet	
Loxorhynchus grandis	sheep crab	
Margarites spp.	sea snail	
Maxwellia gemma	sea snail	
Megabalanus californicus	acorn barnacle	
Megalorchestia spp. [Orchestoidea spp.]	beach hopper amphipods	
*Megastraea undosa (*prev. *Lithopoma undosum* and *astera undosa)*	wavy turban snail	
Megathura crenulata	giant keyhole limpet	
Metridium sp.	plumose sea anemone	
Mitra idae	Ida's miter	
Mopalia spp.	chitons	
Muricea californica	golden gorgonian	
Muricea fruticosa	brown gorgonian	
Mytilus californianus	California mussel	
Mytilus galloprovincialis	saltwater mussel	
Mytilus trossulus	foolish mussel	
Norrisia norrisi	Norris' top snail	
Nucella emarginata	rock whelk	
Nucella ostrina	whelk	
Nuttallina spp.	chitons	
Ocenebra circumtexta	sea snail	
Olivella biplicata	purple olive snails	
Ophioplocus esmarki	smooth brittle star	
Ophiothrix spp.	brittle star	
Ophlitaspongia pennata	red encrusting sponge	
Orthasterias koehleri	rainbow star, redbanded star	
Pachycerianthus fimbriatus	tube anemone	
Pachygrapsus crassipes	striped shore crab	
Pagurus hirsutiusculus	hairy hermit crab	
Pagurus samuelis	bluebanded hermit crab	
Panulirus interruptus	California spiny lobster	
Paracyathus stearnsi	brown cup coral	
Parapholas californica	scale-sided piddock clam	
Parastichopus californicus	California sea cucumber	
Parastichopus parvimensis	warty sea cucumber	
Petaloconchus montereyensis	Monterey wormsnail	
Phragmatopoma californica	sandcastle worm	
Physa virgata	pouch snail	
Pisaster brevispinus	short-spined star, pink sea star	
Pisaster giganteus	giant spined star	
Pisaster ochraceous	ochre sea star	
Pista elongate	worm	
Pollicipes polymerus	gooseneck barnacle	
Porifera spp.	sponges	
Pseudochama exogyra	Pacific jewelbox	
Pseudocnus spp.	sea cucumber	
Pseudocnus spp.	tar spot sea cucumber	
Pteriomorpha	mussel	
Pugettia spp.	kelp crab	
Pycnopodia helianthoides	sunflower star	
Randallia ornata	purple globe crab	
Sabellariidae	honeycomb worms	
Salmacina tribranchiata	fragile tube worm	

Table E-9. Marine Invertebrates.[1]

Species Name	Common Name	Status (if any)
Semibalanus cariosus	thatched barnacle	
Septifer spp.	sand mussel	
Serpula vermicularis	red tube worm	
Serpulorbis squamigerus	scaled wormsnail	
Spirobranchus spinosus	Christmas tree worm	
Spirorbis spp.	spiral tube worm	
Strongylocentrotus franciscanus	red sea urchin	
Strongylocentrotus purpuratus	purple sea urchin	
Styela montereyensis	long-stalked sea squirt	
Stylantheca porphyra	encrusting hydrocoral	
Stylaster californica	purple hydrocoral, California hydrocoral	
Tegula aureotincta	sea snail, tegula snail	
Tegula eiseni	western banded tegula snail	
Tegula funebralis	black turban snail	
Tethya aurantia	orange puffball sponge	
Tetraclita rubescens	pink acorn barnacle	
Tivella stultorum	Pismo clams	
Tridacna crocea	boring clam	
Trivia californica	California trivia, coffee bean trivia	
Urticina lofotensis	whitespotted rose anemone	
Urticina piscivora	fish-eating anemone	
Urticina sp.	anemone	

1. Sources:

Daniel Pondella, Vantuna Research Group, subtidal surveys conducted as part of the Southern California Coastal Water Research Project's BIGHT '08 program (SCCWRP 2008).

Merkel & Associates, Inc, (MA&I). 2007. Naval Base Ventura County, San Nicolas Island Area of Special Biological Significance Biological Survey Report.

Pete Raimondi, UCSC, PISCO intertidal surveys conducted as part of the ASBS storm water discharge exemption process (2007-2009). As referenced in MA&I 2007.

Ian Taniguchi, CDFG, *pers. comm.*

John Ugoretz, NAVAIR marine biologist, *pers. comm.*

Table E-10. Marine Fishes.[1]

Species Name	Common Name	Status (if any)
Alloclinus holderi	island kelpfish	
Artedius lateralis	smoothhead sculpin	
Atractoscion nobilis	white seabass	
Aulorhynchus flavidus	tubesnout	
Brachyistius frenatus	kelp perch	
Caulolatilus princeps	ocean whitefish	
Cephaloscyllium ventriosum	swell shark	
Chromis punctipinnis	blacksmith	
Clinocottus analis	woolly sculpin	
Embiotoca jacksoni	black surfperch	
Embiotoca lateralis	striped seapearch	
Girella nigricans	opaleye	
Gymnothorax mordax	California moray eel	
Halichoeres semicinctus	rock wrasse	
Heterodontus francisci	horn shark	
Heterostichus rostratus	giant kelpfish	
Hypsurus caryi	rainbow seaperch	
Hypsypops rubicundus	garibaldi	
Medialuna californiensis	halfmoon	
Myliobatis californica	bat ray	
Ophiodon elongatus	lingcod	
Orthonopias triacis	snubnose sculpin	
Oxyjulis californica	señorita	
Oxylebius pictus	painted greenling	
Paralabrax clathratus	kelp bass, calico bass	
Paralichthys californicus	California halibut	
Phanerodon furcatus	white seaperch	
Pleuronichthys ritteri	spotted turbot	
Rhacochilus (damalichthys) vacca	pile perch	

Table E-10. Marine Fishes.[1]

Species Name	Common Name	Status (if any)
Rhacochilus toxotes	rubberlip seaperch	
Rhinogobiops (coryphopterus) nicholsii	blackeye goby	
Scorpaena guttata	California scorpionfish, sculpin	
Scorpaenichthys marmoratus	cabezon	
Sebastes atrovirens	kelp rockfish	
Sebastes auriculatus	brown rockfish	
Sebastes carnatus	gopher rockfish	
Sebastes caurinus	copper rockfish	
Sebastes chrysomelas	black and yellow rockfish	
Sebastes dallii	calico rockfish	
Sebastes levis	cowcod	Federally overfished
Sebastes miniatus	vermillion rockfish	
Sebastes mystinus	blue rockfish	
Sebastes rastrelliger	grass rockfish	
Sebastes serranoides	olive rockfish	
Semicossyphus pulcher	California sheephead	
Seriola lalandi	yellowtail	
Sphyraena argetea	Pacific barracuda	
Stereolepis gigas	giant sea bass	
Torpedo californica	torpedo ray, electric ray	
Trachurus symmetricus	leopard shark	
Zalembius rosaceus	pink seaperch	

1. Sources:

Biogeography of the nearshore rocky-reef fishes at the southern and Baja California islands, Daniel J. Pondella II, Brooke E. Gintert, Jana R. Cobb and Larry G. Allen, Journal of Biogeography (J. Biogeogr.) (2005) 32, 187-201

Merkel & Associates, Inc, Naval Base Ventura County, San Nicolas Island Area of Special Biological Significance Biological Survey Report (2007)

John Ugoretz, NAVAIR marine biologist, *pers. comm.*

Table E-11. Pinnipeds and Fissiped.[1]

Species Name	Common Name	Status (if any)
Zalophus californianus	California sea lion	MMPA protected
Mirounga angustirostris	northern elephant seal	MMPA protected
Phoca vitulina richardii	Pacific harbor seal	MMPA protected
Arctocephalus townsendi	Guadalupe fur seal	FT, MMPA protected
Enhydra lutris nereis	southern sea otter	FT*, MMPA protected

1. Sources: (NAWCWD 2002)

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Appendix F: San Nicolas Island Landscaping Plant List

The following list contains approved native plants for use on San Nicolas Island (SNI). Due to strict biosecurity measures, plants and/or soil may not be brought to the island in order to reduce the threat of transmitting disease or pests. All plants listed below may either be developed from stock on the island or brought in from seed. **ANY PLANT MATERIAL MUST BE APPROVED BY NBVC ENVIRONMENTAL BEFORE TRANSPORT TO SNI.** Other plants may be requested and approved by NBVC Environmental. Use the Landscaping Guidelines which provide web sources to identify plants that are not known to be invasive at this time. Contact NBVC Environmental to receive these guidelines.

Herbaceous Plants - native perennials grown in the island native plant nursery.

- *Abronia maritima*
- *Abronia umbellatum*
- *Achillea millefolium*
- *Ambrosia chamissonis*
- *Artemesia nesiotica*, endemic perennial
- *Astragalus traskiae*, endemic perennial
- *Atriplex pacifica*
- *Atriplex watsonii*, perennial
- *Baccharis pilularis* ssp. *consanguinea*
- *Calystegia macrostegia amplissima*, endemic perennial
- *Camissonia cheiranthifolia* ssp. *suffruticosa*
- *Cirsium occidentale*
- *Coreopsis gigantea*
- *Dudleya virens*, endemic perennial, use salvaged or seed grown only
- *Eriogonum grande*, endemic perennial
- *Heliotropium curassavicum*
- *Hemizonia clementina*, endemic perennial
- *Isocoma menziesii*
- *Lomatium insulare*, endemic perennial
- *Lotus argophyllus*, endemic
- *Lupinus albifrons*
- *Malocothrix saxatilis* var. *implicata*
- *Marah macrocarpus*
- *Nassella cernua*, from seed only
- *Stipa diegoensis*, from seed only

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Appendix G: Reporting on Migratory Bird Management

Each INRMP must address the conservation of birds and their habitat to promote and support migratory birds in compliance with the MBTA, EO 13186 and any subsequent rules, and agreements. Navy policy is that, during annual reviews of INRMPs, installations will discuss with the USFWS conservation measures implemented and the effectiveness of these measures in avoiding, minimizing, or mitigating the take of migratory birds (USDON 2006).

USDOD Migratory Bird Rule and Guidance

The USDOD has specific requirements under implementation of MBTA regulations. Following a U.S. District Court decision that granted an injunction on live fire military training on behalf of a private party, Congress enacted the 2003 NDAA, which authorized an interim period during which the prohibitions on incidental take of migratory birds would not apply to military readiness activities. During this interim period, Congress also directed the Secretary of Interior to, not later than one year after enactment of the NDAA, promulgate a regulation to deal with the incidental take of migratory birds in conjunction with military readiness activities from the take prohibition of the MBTA. Under the 2003 National Defense Authorization Bill, the House Armed Services Committee authorized a set of initiatives intended to "restore a balance between protecting the environment and military readiness." One of these initiatives, regarding the MBTA, stated:

> "The Migratory Bird Treaty Act allows federal agencies to obtain permits to remove migratory birds for economic or safety reasons, such as clearing geese from a golf course or runway. However, a federal court ruled in March 2002 that Navy activities at a training range near Guam violated the MBTA because the court felt that the law does not allow for permits for the accidental taking of birds during military readiness activities. As a result, the court temporarily shut down military training at the facility. In order to ensure that USDOD can operate all of its facilities without further interruptions of this nature, the conferees provided the USDOD with authority under which the MBTA would not apply to the incidental taking of a migratory bird by USDOD during an authorized military readiness activity. In addition, the conferees directed the Secretary of the Interior, with the concurrence of USDOD, to exercise its authority within one year to initiate regulations that would exempt USDOD from the MBTA for incidental takings of migratory birds during authorized military readiness activities."

The Migratory Bird Rule relates to military readiness activities and was established in accordance with Section 315 of the NDAA for FY 2003. The final rule, "Migratory Bird Permits: Take of Migratory Birds by the Armed Forces", was published as 50 CFR Part 21 in the 28 February FR (pg. 8931-8950). It authorizes the military to "take" migratory birds under the MBTA without a permit, but if the military determines that the activity will "significantly" affect a population of migratory birds, they must work with the USFWS to implement conservation measures to minimize/mitigate the effects.

This is different from the USFWS/USDOD MOU (FR 30 August 2006) which addresses the conservation of migratory birds on military lands in relation to all activities except readiness. The MOU is a guidance document on how the USDOD will conserve migratory birds and does not authorize any take. Key to implementing the MBTA Rule and guidance documents on the MOU between the USFWS and USDOD are the wording of the authorization for take that requires an understanding of the definition of the following terms:

Population, as used in Section 21.15, a group of distinct, coexisting (conspecific) individuals of a single species, whose breeding site fidelity, migration routes, and wintering areas are temporally and spatially stable, sufficiently distinct geographically (at some time of the year), and adequately described so that the population can be effectively monitored to discern changes in its status.

Significant adverse effect on a population, used in Section 21.15, means an effect that could, within a reasonable period of time, diminish the capacity of a population of migratory bird species to sustain itself at a biologically viable level. A population is "biologically viable" when its ability to maintain its genetic diversity, to reproduce, and to function effectively in its native ecosystem are not significantly harmed. This effect may be characterized by increased risk to the population from actions that cause direct mortality or a reduction in fecundity. Assessment of impacts should take into account yearly variations and migratory movements of the impacted species. Due to the significant variability in potential military readiness activities and the species that may be impacted, estimates of significant measurable decline will be determined on a case-by-case basis.

In April 2007, guidance was issued by the Under Secretary of Defense for Acquisition, Technology and Logistics on implementing the MOU to Promote the Conservation of Migratory Birds between the USFWS and USDOD in accordance with EO 13186 (17 January 2001). This guidance covers all activities on Navy property including natural resources management, routine maintenance and construction, industrial activities, and hazardous waste cleanups.

The guidance emphasizes interdisciplinary collaboration in framework of NABCI Bird Conservation Regions, collaborative inventory and long-term monitoring.

Many questions remain about how to implement the Migratory Bird Rule and the new guidance on the USFWS-USDOD MOU. For example, how the evaluation of significance needs to be addressed in decision documents is still being worked out. Since the impact assessment must be conducted on populations of migratory birds, there may be a need to collect better population baseline data.

Conservation measures undertaken under the Migratory Bird Rule require monitoring and record-keeping for five years from the date the Armed Forces commence their conservation action. During INRMP reviews, the Armed Forces must report to the USFWS migratory bird conservation measures implemented and the effectiveness of the conservation measures in avoiding, minimizing, or mitigating take of migratory birds.

Executive Order 13186 and USDOD Migratory Bird MOU

For USDOD activities other than military readiness, migratory bird concerns are addressed through a MOU (July 2006) developed in accordance with EO 13186 “Responsibilities of Federal Agencies to Protect Migratory Birds, signed 10 January 2001.” The USFWS/USDOD MOU (FR 30 August 2006) that evolved out of the requirements of the EO addresses the conservation of migratory birds on military lands in relation to all activities except readiness. The MOU is a guidance document on how the USDOD will conserve migratory birds and does not authorize any take. In April 2007, further guidance was issued by the Under Secretary of Defense for Acquisition, Technology and Logistics on implementing the MOU to Promote the Conservation of Migratory Birds between the USFWS and USDOD in accordance with EO 13186. This guidance covers all activities at SNI, including natural resources management, routine maintenance and construction, industrial activities, and hazardous waste cleanups. The guidance emphasizes interdisciplinary collaboration in framework of NABCI Bird Conservation Regions, collaborative inventory and long-term monitoring. The EO directs executive departments to take certain actions regarding the protection of migratory birds. In the interim period until the MOU is signed, the EO encourages federal

agencies “to begin immediately implementing the conservation measures” identified in the EO, “as appropriate and practicable.” The DASN(I&E) in a 19 January 2001 memorandum to the CNO and Commandant of the Marine Corps issued guidance on EO compliance. This guidance provides that U.S. Navy activities should comply with the “intent” of the EO until the EO required MOU is completed.

A Council for the Conservation of Migratory Birds was established to help agencies implement the EO. The EO requires NEPA evaluations to include effects on migratory birds and that advance notice or annual reports must be made to the USFWS concerning actions that result in the taking of migratory birds. The EO also requires agencies to control the establishment of exotic species that may endanger migratory birds and their habitat. Pursuant to its MOU, each agency shall, to the extent permitted by law and subject to the availability of appropriations and within Administration budgetary limits, and in harmony with agency missions:

- Support the conservation intent of the migratory bird conventions by integrating bird conservation principles, measures, and practices into agency activities and by avoiding or minimizing, to the extent practicable, adverse impacts on migratory bird resources when conducting agency actions;
- Restore and enhance the habitat of migratory birds, as practicable;
- Prevent or abate the pollution or detrimental alteration of the environment for the benefit of migratory birds, as practicable;
- Design migratory bird habitat and population conservation principles, measures, and practices, into agency plans and planning processes (natural resource, land management, and environmental quality planning, including, but not limited to, forest and rangeland planning, coastal management planning, watershed planning, etc.) as practicable, and coordinate with other agencies and nonfederal partners in planning efforts;
- Within established authorities and in conjunction with the adoption, amendment, or revision of agency management plans and guidance, ensure that agency plans and actions promote programs and recommendations of comprehensive migratory bird planning efforts such as PIF, U.S. National Shorebird Plan, North American Waterfowl Management Plan, North American Colonial Waterbird Plan, and other planning efforts, as well as guidance from other sources, including the Food and Agricultural Organization's International Plan of Action for Reducing Incidental Catch of Seabirds in Longline Fisheries;
- Ensure that environmental analyses of federal actions required by the NEPA or other established environmental review processes evaluate the effects of actions and agency plans on migratory birds, with emphasis on species of concern;
- Provide notice to USFWS in advance of conducting an action that is intended to take migratory birds, or annually report to USFWS on the number of individuals of each species of migratory birds intentionally taken during the conduct of any agency action, including but not limited to banding or marking, scientific collecting, taxidermy, and depredation control;
- Minimize the intentional take of species of concern by: (i) delineating standards and procedures for such take; and (ii) developing procedures for the review and evaluation of take actions. With respect to intentional take, the MOU shall be consistent with the appropriate sections of 50 CFR parts 10, 21, and 22;
- Identify where unintentional take reasonably attributable to agency actions is having, or is likely to have, a measurable negative effect on migratory bird populations, focusing first on species of concern, priority habitats, and key risk factors. With respect to those actions so identified, the agency shall develop and use principles, standards, and practices that will lessen the amount of unintentional take, developing any such conservation efforts in cooperation with USFWS. These principles, standards, and practices shall be regularly evaluated and revised to ensure that they are effective in lessening the detrimental effect of agency actions on migratory bird populations. The agency also shall inventory and monitor bird habitat and populations within the agency's capabilities and authorities to the extent feasible to facilitate decisions about the need for, and effectiveness of, conservation efforts;

- Within the scope of its statutorily-designated authorities, control the import, export, and establishment in the wild of live exotic animals and plants that may be harmful to migratory bird resources;
- Promote research and information exchange related to the conservation of migratory bird resources, including coordinated inventorying and monitoring and the collection and assessment of information on environmental contaminants and other physical or biological stressors having potential relevance to migratory bird conservation. Where such information is collected in the course of agency actions or supported through federal financial assistance, reasonable efforts shall be made to share such information with USFWS, the USGS-Biological Resources Division, and other appropriate repositories of such data (e.g. the Cornell Laboratory of Ornithology);
- Provide training and information to appropriate employees on methods and means of avoiding or minimizing the take of migratory birds and conserving and restoring migratory bird habitat;
- Promote migratory bird conservation in international activities and with other countries and international partners, in consultation with the Department of State, as appropriate or relevant to the agency's authorities;
- Recognize and promote economic and recreational values of birds, as appropriate; and
- Develop partnerships with non-federal entities to further bird conservation.

Migratory Birds and the SNI INRMP

Many natural resources management activities undertaken under this INRMP benefit migratory birds including feral cat control, habitat management, erosion control, managing for healthy habitats with little human activity, and invasive weed management. In addition, USFWS Birds of Conservation Concern and birds ranked in national and international plans that use SNI natural resources are identified. Annual monitoring and regularly scheduled surveys including project or readiness surveys are performed on SNI in compliance with the Migratory Bird Rule for all avian groups and potentially affected bird species.

Of the over 300 species identified to utilize SNI, 58 have some special status assigned by government or non-government agencies (ESA, CESA, MBTA, U.S. Shorebird Conservation Plan, and U.S. Seabird Conservation Plan; See Table 3-6 under *Section 3.8: Special Status Species*).

The following management measures are implemented by this INRMP:

Objectives and Strategies for Migratory Birds

Objective: Comply with the Migratory Bird Treaty Act, 2003 Defense Reauthorization Act Migratory Bird Rule, Executive Order 13186, and other federal laws, regulations, and Memoranda of Understanding regarding the protection of migratory birds.

Objective: Identify and conserve viable habitat for migratory birds that use SNI for breeding, nesting, resting, or feeding.

I. Inventory and monitor habitat and populations of migratory birds that use SNI to evaluate conservation effectiveness through Navy efforts at SNI and by cooperating with other large-scale efforts.

A. Identify migratory bird species of concern for SNI that will be the focus of monitoring (see Table 3-6).

1. To identify bird species of concern, SNI adopts the species that may use its land and waters listed in periodic reports of Birds of Conservation Concern published by the USFWS Division of Migratory Bird Management; priority migratory bird species documented in the comprehensive bird conservation plans (U.S. Shorebird Conservation Plan, Colonial Seabird Conservation Plan, North American Waterbird Conservation Plan); species or populations of waterfowl identified as high, or moderately

high, continental priority in the North American Waterfowl Management Plan; focus species identified in the California PIF plans; listed threatened and endangered bird species in 50 CFR 17.11; and MBTA-listed game birds below desired population sizes.

B. Maximize the effectiveness of ongoing monitoring and management efforts by continuing to implement standardized, scientifically sound survey protocols to collect and analyze population abundance and distribution of birds across water, upland, and transitional habitat types and seasonally. Ensure that survey protocols will establish current local population sizes and also permit credible estimates of population trends at five-year intervals. By standardizing monitoring techniques, researchers ensure that results can be compared across space and time.

1. Consolidate existing migratory bird monitoring information.

2. Maximize the cost effectiveness and value of existing specialized monitoring programs for listed species by collecting standardized data on multiple species (such as point counts) in addition to any specialized protocols aimed at one species.

a. Support efforts to monitor the established point count stations as a long-term standardized population monitoring program by partnering with the USFWS.

3. Inventory birds using methods that can be integrated with the work of regional partners.

a. Investigate the compatibility of the USFS published guidelines for standardized monitoring techniques for monitoring birds (Ralph *et al.* 1993) for use at SNI.

b. Determine how current established monitoring programs might contribute to regional databases and monitoring protocols, including the Breeding Bird Survey, Breeding Bird Atlas, Colonial Waterbird Surveys, International Shorebird Survey, Hawk Migration Surveys, Breeding Bird Census, Winter Bird Population Studies, survey information collected locally by federal and state agencies, and the USGS Bird Banding Laboratory. As appropriate, coordinate with Avian Knowledge Network and USDOD e-bird databases to ensure bird monitoring data are submitted.

C. The transitory nature of many migratory birds complicates assessment of the health of habitats and populations. In support of California PIF bird management plans, consider conducting intensive, long-term monitoring at selected sites for more than five years, including both reference sites and at key experimental sites.

1. In the Migratory Bird Rule under the Defense Reauthorization Act, the USFWS would "encourage the USDOD to develop information that will assist in guiding its decisions regarding migratory bird conservation, particularly in developing or amending INRMPs. This Rule would not require the USDOD to obtain new data to assess impacts of a proposed or an ongoing action on birds in order to comply with the provisions of this rule. Existing demographic, population, habitat association, species indicator, or ecological indicator data may be used to estimate the level of take and evaluate whether a proposed or an ongoing action is likely to have a significant adverse impact on a population."

D. Collect and assess information on environmental contaminants and other physical or biological stressors having potential relevance to migratory bird conservation. Where such information is collected in the course of agency actions or supported through federal financial assistance, reasonable efforts shall be made to share such information with the USFWS, the USGS-Biological Resources Division, and other appropriate repositories of such data.

E. To comply with the Defense Reauthorization Act, SNI should use the best scientific data available to assess through the NEPA process, or other environmental requirements, the expected impact of proposed or ongoing military readiness activities on migratory bird species likely to occur in action areas.

F. Regularly monitor infrastructure that may pose a hazard to migratory birds, such as wind turbines, in order to document any significant adverse impact to migratory bird populations.

G. SNI should address impacts on species of concern more thoroughly and specifically, focusing on the effects of the proposed action on the sustainability of these populations. Special consideration should be given to priority habitats, such as important nesting areas, migration stop-over areas, and wintering habitats.

H. Continue to update breeding bird surveys for migratory avian species.

1. Link this effort with that of other needed surveys to cost-effectively evaluate ecological conditions and trends.

I. Include the results of monitoring in the annual review of this INRMP.

J. Promote research and information exchange, including coordinated inventory and monitoring (EO 13186).

1. Increase communication and coordination between land managers and specialists hired to implement specific projects or conduct monitoring. Coordinate with monitoring and research projects targeted at non-avian taxa to maximize the benefits of the protection, management and restoration of riparian habitats.

2. Use cooperative assistance from wildlife agencies, organizations, and volunteers to help collect needed data. Integrate with regional databases.

II. Conserve, restore, and enhance migratory bird habitat, as practicable. Improvements to existing habitat include wetland protection, maintenance and enhancement of buffers, elimination of feral animals (in particular, feral cats) that may be a threat to migratory birds, and elimination of invasive species that crowd out other species necessary to migratory bird survival (2003 DRA Proposed Rule).

A. Avoid detrimental habitat alteration caused by establishment of invasive plants.

B. Avoid encroachment into the springs, seeps, and washes by preventing off-road activity and trespass into these areas.

C. Complete the feral cat removal program initiated in the spring of 2009 and perform post removal monitoring.

D. Ensure that use, protection, and enhancement of naturally occurring and man-made water sources do not adversely affect use by avian species.

E. Support biological research of species, interactions with mammalian predators, and impacts from increasing marine mammal presence.

F. Remove unused communication towers, antennas and other structures, which could pose a hazard to migratory birds.

G. When operationally practicable, follow the USFWS guidelines for the siting, construction and operation of communications towers.

H. Maintain and enhance primary roosting, foraging, and nesting sites.

1. Identify opportunities for maintaining and enhancing primary habitats.

2. Develop a migratory bird protection protocol for routine maintenance activities such as mowing and tree trimming.

I. Identify opportunities through mitigation and non-mitigation funding to protect existing, restore degraded, and recover priority bird habitats.

J. Support cleanup efforts to reduce contaminants and toxic buildup in the ecosystem, including monitoring and reducing nonpoint sources.

K. Investigate use by birds of unused antennae and guy wires, and means to eliminate these as a hazard to migratory birds.

III. Implement bird conservation principles, measures, and practices through avoidance and minimization measures to protect migratory bird populations.

A. The principal means of evaluating the effect of actions on migratory birds will be through the NEPA process or other established environmental review processes, with emphasis on species of concern (EO 13186).

B. NBVC will prepare NEPA analyses whenever it proposes to undertake a new military readiness activity that may significantly affect the quality of the human environment; make a substantial change to an ongoing military readiness activity that is relevant to environmental concerns; learn of significant new circumstances or information relevant to the environmental concerns bearing on an on-going military readiness activity; or prepare or revise an INRMP covering an area used for military readiness activities.

C. Obvious avoidance measures will be considered at the outset of project planning, such as siting projects to avoid important nesting areas or to avoid collisions of birds with structures, or timing projects to avoid peak breeding activity.

D. Minimize the intentional take of species of concern.

1. EO 13186 and MBTA require that SNI provide notice to the USFWS in advance of conducting an action that is intended to take migratory birds and is not directly related to authorized military readiness activities, or annually report to the Service on the number of individuals of each species of migratory birds intentionally taken during the conduct of any agency action, including but not limited to banding or marking, scientific collecting, taxidermy, and depredation control.

2. Develop standards, protocols, and procedures for such take.

3. Humanely control non-native animal species when necessary.

4. Review and evaluate actions that take migratory birds for means to avoid and minimize such take, with emphasis on activities that may affect the sustainability of migratory bird species of concern.

E. Identify areas of unintentional take of species of concern and minimize such take. Executive Order 13186 states that agencies will identify where unintentional take reasonably attributable to agency actions is having, or is likely to have, a measurable negative effect on migratory bird populations, focusing first on species of concern, priority habitats, and key risk factors. With respect to those actions, the agency (NBVC) shall develop and use principles, standards, and practices that will lessen the amount of unintentional take, developing any such conservation efforts in cooperation with the USFWS. These principles, standards, and practices shall be regularly evaluated and revised to ensure that they are effective in lessening the detrimental effect of agency actions on migratory bird populations.

1. Restrict access into and disturbance of nesting and breeding grounds during critical periods. Incorporate this restriction as a mitigation for proposed projects.

2. Prevent or abate effects on migratory bird populations caused by pollution.

3. Reduce pesticide use (see also *Section 5.14: Landscaping and Grounds Maintenance*). Continue to limit the use of rodenticides. Remove any dead or dying rodents from a treated area to reduce the possibility of secondary poisoning through raptor predation of poisoned rodents.

F. Provide training and information to employees regarding protection of migratory birds in compliance with laws to avoid and minimize take and conserve and restore habitat (EO 13186).

1. Limit disturbance during the breeding season. Promote understory and groundcover quality by postponing mowing until after peak breeding season. If mowing must be done during breeding season, maintain a low herbaceous layer of no more than six inches to discourage birds from nesting there in the first place. Limit restoration activities and disturbance events such as grazing, disking, and herbicide application to the nonbreeding season. When such actions are absolutely necessary during the breeding season, time disturbance to minimize its impacts on nesting birds.

G. Set guidelines to protect migratory birds such as requirements for towers and guy wires to reduce bird mortalities.

IV. Reduce bird/animal aircraft strike hazards.

A. Collect bird/animal aircraft incident data and maintain records of BASH incidents, including time of day, date, species involved, and location.

B. Continue efforts to develop and implement a BASH plan.

C. Ensure that SNI natural resources manager attends classes on bird hazards to aircraft operation.

D. Mow airfield and adjacent areas to discourage use by avian species.

E. Remove potential bird perches from the airfield vicinity.

F. Support censuses of the airfield area to determine avian usage patterns.

Objectives and Strategies for Resident Birds

Objective: Identify and conserve viable habitat for resident birds that use SNI for breeding, nesting, and feeding.

Objective: Continue to develop practical strategies that provide for the needs of federally-listed shorebirds and military values of the coastal strand/beach areas.

I. Monitor populations of resident land birds.

A. Support biannual counts (using established methodology) of resident land birds, to determine relative abundance of species during breeding and nonbreeding season.

1. Partner with the USFWS or other organizations when conducting point count surveys in order to support bird inventories for resident land birds.

B. Support additional surveys to determine the status of American kestrels.

C. Support winter surveys to determine numbers and locations of burrowing owls.

D. Investigate breeding bird use areas for land birds through using surveys that require a species-specific research design.

1. Support studies that investigate the habitat use of orange-crowned warblers on coreopsis or willow-patch.
2. Support studies that investigate the habitat use of house finches on cactus.

II. Protect the sustainability of resident land bird populations and their habitat.

A. Set guidelines and standards for construction of towers and guy wires to reduce bird mortalities.

B. Whenever possible, conduct roadside and airfield mowing outside the breeding season of native ground nesting land birds. Promote understory and groundcover quality by postponing mowing until after peak breeding season. If mowing must be done during breeding season, maintain a low herbaceous layer of no more than six inches to discourage birds from nest-

ing there in the first place. Limit restoration activities and disturbance events such as grazing, disking, and herbicide application to the nonbreeding season. When such actions are absolutely necessary during the breeding season, time disturbance to minimize its impacts on nesting birds.

C. Enhance important surface water areas used by resident land birds.

1. Continue Arundo donax removal and riparian restoration at Humphrey Sump.

2. Remove invasive non-native species at Humphrey Sump.

III. Monitor resident shorebird populations and breeding colonies.

A. Develop a standard format and a database to collect and maintain records of shorebird observations on SNI.

B. Support studies that document the loss of sandy beach habitat to shorebirds as a result of the increased use of those areas by marine mammal pinnipeds.

1. Support studies that investigate potential negative interactions between special status avian species such as the western snowy plover and increased use of sandy beach habitat by marine mammal pinnipeds.

C. Increase the level of western snowy plover monitoring in order to capture nesting success.

D. Continue to investigate and assess military activity effects on migratory birds, such as nesting shorebirds, in order to comply with the Migratory Bird Rule.

E. Determine the status, health, and habitat use of certain target or indicator species not currently listed, including the black oystercatcher.

F. Use cooperative assistance from wildlife agencies, non-governmental organizations, and volunteers to collect needed data.

G. Continue efforts to keep island free of feral cats.

H. Dead birds found in areas not inhabited by humans should be left alone and reported to the Environmental office or collected and given to an appropriate facility.

IV. Protect the sustainability of resident shorebird populations and their habitat.

A. Avoid shoreline construction that results in a loss of coastal strand/beach habitat, except for the currently planned improvement to the RO facility at Coast Guard Beach.

B. If it is determined that a non-native species is having a direct effect on a sensitive native resident shorebird species, then take appropriate removal actions for the pest.

V. Monitor resident seabird populations and breeding colonies.

A. Increase seabird monitoring to capture nesting success.

B. Continue aerial surveys of Brandt's cormorants nesting colonies to determine distribution and breeding population size.

C. Investigate methods to assess distribution of western gull nest sites and reproductive success.

1. Support studies that investigate potential negative interactions of the redistribution of western gull nests into western snowy plover habitat.

D. Support outside research of seabird biology, interactions with mammalian predators, and impacts from increasing marine mammal presence.

E. Continue to investigate and assess military activity effects on migratory birds, such as nesting seabirds, in order to comply with the Migratory Bird Rule.

VI. Protect the sustainability of resident sea bird populations and their habitat.

A. Maintain closure signs and gates around Brandt's cormorants nesting colonies.

B. Investigate feasibility of fencing cormorant colonies to keep out foxes.

C. Continue efforts to remove feral cats from the Island in support of the California's WAP recommendation to expand efforts to eradicate introduced predators from all seabird colonies and also in support of the Montrose Settlements Restoration Program Final Restoration Plan to restore seabirds at SNI.

VII. Prepare educational materials regarding SNI's resident birds and management practices. Include information on what personnel can do to help, species lists, and activities detrimental to resident bird populations.

Appendix H: Biological Opinions

(1) U.S. Fish and Wildlife Service. 2001. Programmatic Biological Opinion for Activities on San Nicolas Island, California (1-8-01-F-14).

(2) U.S. Fish and Widlife Service. 2010. Biological Opinion for the San Nicolas Island Wind Energy Project, Ventura County, California (8-8-10-F-35).

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United States Department of the Interior

FISH AND WILDLIFE SERVICE

2493 Portola Road, Suite B
Ventura, California 93003

October 15, 2001

Carolyn A. Shepherd, Head
Environmental Project Office
Naval Air Weapons Station
1 Administration Circle
China Lake, California 93555-6100

Subject: Biological Opinion for Activities on San Nicolas Island, California (5090 Ser 8G0000D/7284) (1-8-01-F-14)

Dear Ms. Shepherd:

This document transmits the U.S. Fish and Wildlife Service's (Service) biological opinion based on our review of the U.S. Navy's (Navy) ongoing activities on San Nicolas Island and the effects on the federally endangered brown pelican (*Pelecanus occidentalis*) and island night lizard (*Xantusia riversiana*), and the threatened western snowy plover (*Charadrius alexandrinus nivosus*) and its critical habitat, in accordance with section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.). Your December 21, 2000, request for formal consultation was received on December 26, 2000.

This biological opinion is based on information which accompanied your December 21, 2000, request for consultation, including the biological assessment (Navy 2000), discussions between Navy and Service biologists, and our files.

SOUTHERN SEA OTTER

Between 1987 and 1990, the Service translocated 140 endangered southern sea otters (*Enhydra lutris nereis*) to San Nicolas Island. Under Public Law 99-625, non-Department of Defense (DOD) related activities that may affect the southern sea otters at San Nicolas Island are to treated as if the species is listed as threatened. However, DOD-related actions carried out directly by a military department (such as those activities addressed in this document) that may affect the southern sea otter are treated differently under Public Law 99-625; that is, southern sea otters are to be treated as members of a species that is proposed to be listed under section 4 of the Act. Therefore, pursuant to section 7(a)(4) of the Act, the Navy must confer with the Service on any action that is likely to jeopardize the southern sea otter.

The Navy did not request conference on the southern sea otter. The Service has concluded that a conference opinion is not necessary because the activities analyzed in this programmatic biological opinion are not likely to jeopardize the species. We have reached this conclusion because, after a decline in numbers to 14 following the initial relocation of southern sea otters to San Nicolas Island, the number of southern sea otters has increased and appears to be stable at approximately 20 individuals. The Navy has not proposed any changes in its activities from those that have been conducted since the translocation. Consequently, southern sea otters are not likely to be affected differently than they have been over the past 14 years. Finally, the southern sea otters at San Nicolas Island represent a small portion of the subspecies' current population.

CONSULTATION HISTORY

Informal consultation regarding the activities on San Nicolas Island was initiated on July 28, 1998. On that date, Rick Farris of the Service met with Grace Smith and Steve Schwartz of the Navy to discuss the range of activities that were occurring on San Nicolas Island and the potential effects to listed species. We determined at that meeting that a programmatic approach, similar to that prepared for the Navy Base Ventura County (Service 2001), to satisfy the Navy's section 7 responsibilities for the ongoing activities should be undertaken. Following that initial meeting, intermittent discussions took place between Ms. Smith and Mr. Farris regarding elements of the biological assessment and changes to activities which had been implemented since the July 28, 1998, discussion.

We received the request to initiate consultation and the biological assessment on December 26, 2000. In our acknowledgment letter, we requested a 30-day extension to the 135-day timeline to complete the biological opinion. The Navy did not respond to this request. Mr. Farris and Ms. Smith met again on April 24, 2001, to discuss the biological assessment and to clarify some aspects of the information.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

As an element of the Naval Air Warfare Center Weapons Division Sea Range, the Outlying Landing Field San Nicolas Island is managed by the Naval Air Weapons Station at China Lake. The Sea Range covers 36,000 square nautical miles of open ocean, extending approximately 170 nautical miles seaward from the California coast (Figure 1). The Sea Range supports test and evaluation of sea, land, and air weapons systems and various types of training. As part of the Sea Range, San Nicolas Island provides a platform for launches of missiles and targets, while facilities on the island conduct radar tracking and control, range surveillance, telemetry, and communications for weapons testing.

The Navy has identified 13 ongoing and proposed activities that may affect listed species on San Nicolas Island. The actions are described in the biological assessment (Navy 2000) as follows:

Missile and Target Launches

Missiles are currently launched from two locations on San Nicolas Island (Figure 2). The Alpha Complex is located approximately two miles from the western shoreline. The large (38,000 pounds) Vandal missiles are launched from this complex and produce the loudest sounds of any activity on San Nicolas Island (Figure 3). The duration of the sound is short as the missiles cross the northwest shoreline in approximately 4.75 seconds after launching. If fired at the lowest angle of 6 degrees, the Vandals cross the shoreline at approximately 1,000 feet. Other launches are at angles up to 45 degrees so they cross the shoreline at higher elevation. Eight to 14 launches occur per year at the Alpha Complex.

The other launch facility is the Building 807 Launch Complex. These structures are located on the western end of the island near the shoreline (Figure 3). The Building 807 Complex is used to launch smaller missiles than the Alpha Complex. Missiles are launched westward, over the ocean, within a 60 degree azimuth. Two to six launches from the Building 807 Complex may occur any time of the year.

The Navy is proposing to construct and use a new 50K launcher and a vertical launcher. The 50K launcher would be built near, and would be the same size as, the existing Alpha Complex. It would be used approximately 3 times per year and could launch missiles up to 50,000 pounds (larger than the Vandals launched at the Alpha Complex and presumably louder). The vertical launch system would be built near the existing Building 807 Launch Complex. It would also be used three times per year to launch missiles similar to those currently launched from the existing complex. The Navy has not provided any further details on the proposed new launch complexes.

Barge Operations

Supplies are delivered to San Nicolas Island by barges. Barges land from 26 to 40 times each year. The materials brought in on the barge are unloaded at an established site at Daytona Beach (Figure 2). Daytona Beach is on the southeastern side of the island and is approximately 180 to 200 feet wide and 0.8 mile long. The established landing site is on the eastern end of the beach and includes a staging area consisting of an asphalt parking lot, trailer, and storage area. A landing ramp extends from the staging area to water's edge. The beach is at its narrowest here (approximately 75 feet) and is often inundated during high tide.

Depending upon the supplies and conditions, the barges are unloaded in one of two ways. Most commonly, the barge arrives at the landing ramp and the supplies are driven off to the staging area. Alternatively, the barges may land directly on the beach where a temporary landing is formed with sand. The barge is offloaded and the beach is restored to its original condition.

Proposed Pier Construction

The Navy proposes to construct a pier and upgrade existing facilities at the current barge landing site on Daytona Beach (Figure 2). The project has not been finalized and would occur in the near future. The basic components are expected to include: construction of a pier extending into the ocean from the asphalt staging area; removal or replacement of existing structures at the staging area; improvement of the road to the landing site; and extension of utilities to the facility. The Navy believes the construction would take a maximum of two years.

Reverse Osmosis Plant Operation

The Navy currently operates a desalination (reverse osmosis) system to provide potable water for the San Nicolas Island facilities. The plant is at Coast Guard Beach on the eastern end of the island (Figure 2). It consists of shallow wells and a pumping station on the beach. The desalination plant sits on a bluff above the beach. Water that collects in the wells is pumped from the beach to the desalination plant and then to the Navy's facilities. Brine waste generated by the processing is discharged to a well 400 feet from the shoreline on the upper beach. Because the volume of brine waste may exceed the percolation rate, a ponded area of brine water accumulates occasionally around the well site. Up to 70,000 gallons of brine waste is discharged per day and the brine lake may expand to approximately .25 acre. The formation of the brine lake is not predictable and its size fluctuates from the maximum .25 acre to completely dry.

The desalination plant operates continuously during regular work days and the pump must be started at the beginning of each week. Personnel walk to the pump station to start the pump and inspect it; this activity may take 15 minutes. If the pump malfunctions, additional trips to the beach may be needed. Maintenance is required every two years; well points are removed and replaced at this time. This requires movement of sand with an endloader and temporary disturbance of the beach.

In a letter dated February 7, 2001, the Navy requested our concurrence that a proposal to replace the existing desalination plant with a more modern facility would not adversely affect the western snowy plover or its critical habitat. The goal of the project was to remove the pump station and wells from Coast Guard Beach and avoid the weekly disturbance of nesting western snowy plovers, and to eliminate the excavation of the old wells every two or three years. The project included placement of a permanent underground intake and a remotely activated in-line pump. Maintenance of the pump would occur annually thereafter during the season when western snowy plovers are absent. Access to construct the system included installation of a temporary road 150 yards long and 8 yards wide.

The new desalination plant was completed in 2001 prior to the issuance of our response to the request for concurrence. The Navy proceeded with the project because of its desire to complete activities prior to the arrival of nesting western snowy plovers. The new desalination plant failed to function as planned and San Nicolas Island had to revert to its old system until the problems

could be solved. In the interim, the temporary road could not be removed and the new facility could not be repaired because western snowy plovers arrived and began occupying the Coast Guard Beach area. The Navy will revisit the pump station after the western snowy plover nesting season is over in 2001 and repair the new system and remove the temporary road. The repair work, road removal, and operation of the new facility are activities to be evaluated in this biological opinion.

Equipment/Materials Storage and Staging Areas

Storage and staging areas for equipment and construction materials are established at various locations around San Nicolas Island (Figure 2). Materials stored include lumber, pipe, rock, and concrete blocks. Most of the existing staging areas are on the eastern end of the island to be close to the barge landing. Some are permanent while other staging and storage areas are temporary. The Public Works Storage Yard is a permanent area approximately 3 acres in size. The existing temporary sites range from 2,500 square feet up to 4 acres and are placed on previously disturbed areas. Materials are stored in these locations after offloading from the barge or aircraft. As needed, the materials are removed and used at the Navy facilities and the storage areas fluctuate from being bare to holding materials for future use.

Debris Removal

Occasionally, the Navy abandons project sites, leaving behind construction and other materials. These old project sites are located throughout the island and range in size from 100 square feet to 0.5 acre. Debris piles are removed as funding is available or if volunteers undertake the cleanup. The total area covered by debris piles is not known and fluctuates as materials are deposited and removed.

Roadside Maintenance

The Navy must periodically maintain the shoulders of roads on San Nicolas Island to prevent erosion and undermining. This maintenance includes grading and replacement of shoulder materials such as gravel and repair of asphalt. The shoulders range in width from 0 to 8 feet. Roadsides are also mowed to increase visibility of both vehicles and San Nicolas Island foxes (*Urocyon littoralis dickeyi*).

Recreation

Approximately 150 personnel are assigned to San Nicolas Island and they participate in recreational activities. These activities include beachcombing, fishing, boating, kayaking, scuba diving, and biking. Most activity is concentrated on sandy beaches or rocky intertidal areas. Personal watercraft are typically launched from Cissy Cove, Tranquility Beach, or the barge landing (Figure 2). Beach closures are determined by the Environmental Protection Office (EPO) based upon the presence or absence of listed species or marine mammals and are enforced by Navy security.

Natural Resource Research and Management

The Navy conducts or allows numerous resource management and research activities to take place on San Nicolas Island. These include monitoring of state and federally listed species, ecosystem monitoring, removal of non-native species, habitat preservation and restoration, beach and island clean-up projects, and cultural resource surveys.

The Navy-sponsored research and monitoring is conducted by the EPO. This work is mainly monitoring of the western snowy plover population on San Nicolas Island to assess potential impacts from Navy activities. Two island-wide western snowy plover surveys are conducted each year; a breeding season survey in late May, and a census of wintering individuals in December or January. The surveys focus on areas that have operational value for the Navy, such as the barge landing, Coast Guard Beach, Red Eye Beach and Building 807 (Figure 2). The operational areas are surveyed to determine how many western snowy plovers use them and to document nesting success. Nests are not approached or marked.

Surveys for brown pelicans are conducted by aircraft. Monitoring of the island night lizard population is done through a cooperative agreement with the Biological Research Division of the U.S. Geological Survey and under individual recovery permits issued by the Service. The Biological Research Division is proposing more intensive research, including continuation of capture/mark/recapture experiments to establish the ages of individual island night lizards. The effects of these activities on the island night lizard will be evaluated by the Service under the authorization of section 10(a)(1)(A) of the Act.

Amphibious Training Exercises

The Navy conducts amphibious training exercises four to six times per year. These exercises involve a small group of military personnel (30 or less) who approach the island by swimming to shore from a boat. They then traverse the shoreline, conduct clandestine patrols, and overtake a predetermined inland site, typically the airfield. The training lasts from 8 hours to 2 days. Beach landings occur on Red Eye Beach, Tender Beach, Cissy Cove, Coast Guard Beach, or Daytona Beach at the barge landing (Figure 2).

Explosive Ordnance Disposal

On an as-needed, emergency basis, the Navy must dispose of unexploded ordnance. The materials are transported to a designated range and detonated with 2 to 10 pound charges. The explosive ordnance disposal site is 900 feet south of Red Eye Beach.

Proposed Multi-purpose Instrumentation Sites

The Navy proposes to construct five multi-purpose instrumentation sites on San Nicolas Island. The sites would consist of a concrete pad and an access road with mobile instrumentation placed on the pads as needed. The pads would be placed in various locations on the island in areas of coastal scrub or grassland (Figure 2). The Navy does not know the size of the sites and the length of access roads until plans and locations have been finalized.

Routine Small Construction Projects and Utilities Maintenance

The Navy conducts approximately six to ten small construction and utilities projects each year to maintain the facilities' infrastructure. These projects occur in most habitats on the island and each one typically involves less than 5,000 square feet of habitat removal. The area of effect totals approximately 1 acre per year.

Proposed Protective Measures

The Navy proposes to avoid and minimize the effects of the 13 activities discussed above on listed species and critical habitat through the following measures. Some of the measures are meant to be compensatory; that is, while they may not avoid or minimize the effects of the activities, they will support the conservation of the listed species discussed in this biological opinion. These measures are or would be implemented by the EPO.

1. The south side of San Nicolas Island is closed by EPO to all activities to protect the western snowy plover and brown pelican. This closure also provides protection for marine mammals and other sensitive wildlife species.

2. All western snowy plover nesting areas are closed for the duration of the breeding season. Signs and barricades are erected to denote closures and the EPO patrols the beaches periodically.

3. The EPO conducts consistent monitoring of listed species and their habitat to assess the potential for adverse effects from Navy activities.

4. All permanent and visiting personnel are required to attend an environmental briefing that emphasizes federal and Navy regulations pertaining to the protection of listed species and describes the beach closures and their enforcement.

5. Disturbed and unused areas are revegetated with cactus (*Opuntia* spp.) and boxthorn (*Lycium californicum*) to provide habitat for island night lizards.

6. Potential perches for avian predators are removed when feasible.

In addition to these general measures, the Navy proposes to minimize the effects of the specific activities on listed species and critical habitat as follows:

Missile and Target Launches

7. Western snowy plovers currently use the area adjacent to the Building 807 Launch Complex and are at risk of injury or nest loss due to human activities. Approximately 2,500 square feet of the substrate immediately adjacent to the Building 807 Launch Complex may be compacted to make it unsuitable for western snowy plover nesting. The Navy has not established a timeframe for this activity.

Barge Operations

8. All unnecessary structures adjacent to the barge landing facilities that could provide predator perches would be removed or rendered unsuitable for that purpose, as feasible.

9. If western snowy plover nests are found within 600 feet of the barge landing area, the Navy will contact the Service to develop actions to avoid adverse effects.

10. All construction equipment, vehicles, and supplies will be thoroughly cleaned and inspected prior to shipment to San Nicolas Island to reduce the potential for introducing non-native species.

Proposed Pier Construction

11. If western snowy plover nests are discovered within 1,200 feet of the proposed pier location during construction, the Navy will halt its activities and contact the Service to develop actions to avoid adverse effects.

Reverse Osmosis Plant Operation

12. The EPO will coordinate with the operations personnel to define access routes to the pumping station to avoid disturbing nesting western snowy plovers. Operations personnel will not remain in the area any longer than necessary to complete maintenance or repairs.

13. Routine, non-emergency maintenance to the system will be performed outside of the western snowy plover breeding season.

14. Any future upgrades to the system will include modifications to further reduce effects on the western snowy plover.

15. All unnecessary structures in the area which could provide a perch for predators will be removed. Remaining essential structures will have perching deterrents installed, if feasible.

Equipment/Materials Storage

16. Staging areas for temporary storage of equipment and materials will be located where surveys have shown that island night lizard densities are low. If storage areas are located in high quality island night lizard habitat, a 50-foot buffer will be established around the equipment and materials. The buffer will consist of bare asphalt, open ground, or sand. No vegetation would be removed to establish the buffers; the buffers would be incorporated within the already disturbed areas.

17. Artificial habitat which may harbor island night lizards (*e.g.*, stored materials with hiding places) will be surveyed by EPO personnel before such materials are removed. If island night lizards are found, EPO personnel will be present when materials are removed and will relocate any island night lizards encountered to suitable habitat nearby.

18. Habitat for relocated island night lizards will be created by planting appropriate cover in barren areas adjacent to occupied habitat.

Debris Removal

19. Artificial habitat formed by debris which may harbor island night lizards (*e.g.*, stored materials with hiding places) will be surveyed by EPO personnel before any debris is removed. If island night lizards are found, EPO personnel will be present when debris is removed and will relocate any island night lizards encountered to suitable habitat nearby.

20. Habitat for relocated island night lizards will be created by planting appropriate cover in barren areas adjacent to occupied habitat.

Roadside Maintenance

21. Areas of high quality habitat for island night lizards will be excluded from the mowing regime.

Recreation

22. Beaches where western snowy plovers nest will continue to be closed from March 1 through September 15 of each year to prevent disturbance of nesting birds.

23. EPO personnel will monitor the beaches every year to determine if western snowy plovers persistently nest in historical nesting areas. Where western snowy plovers continue to nest, beaches will continue to be closed; if western snowy plovers are absent, beaches may be opened.

Management and Research Activities

24. EPO personnel will coordinate the research and management activities with the EPO natural resource manager to avoid and minimize adverse effects on listed species or critical habitat.

25. Persons conducting research with listed species on San Nicolas Island and not affiliated with the Navy will be required to hold section 10(a)(1)(A) permits from the Service for their activities prior to their access to the island.

Amphibious Training Exercises

26. Beaches where western snowy plovers nest will be closed to amphibious training exercises from March 1 through September 15 each year.

Explosive Ordnance Disposal Activities

27. The explosive ordnance disposal range will be relocated to a site which has no potential to affect listed species or critical habitat.

Proposed Multi-purpose Instrumentation Site Construction

28. The multi-purpose instrumentation sites will be placed to avoid habitat that supports island night lizards or other listed species or critical habitat.

Routine Small Construction Projects and Utilities Maintenance

29. Potential sites for these activities will be surveyed for island night lizards by EPO personnel before any construction or maintenance activity. If island night lizards are found, EPO personnel will be present when vegetation is removed and construction begins and will relocate any island night lizards encountered to suitable habitat nearby.

STATUS OF THE SPECIES

Island Night Lizard

The island night lizard was listed as threatened on August 11, 1977 (42 *Federal Register* 40682). The Service has not designated critical habitat for this species. The following information for the island night lizard was taken from Service (1980), Fellers and Drost (undated.), Fellers and Drost (1991), and Fellers *et al.* (1998).

The island night lizard is endemic to the Channel Islands off the coast of southern California. It occurs on Santa Barbara, San Clemente, and San Nicolas islands, and one small islet (Sutil Island) adjacent to Santa Barbara Island. Compared to other Channel Island endemic vertebrates, island night lizards are apparently the most morphologically distinct from their closest relatives on the mainland, indicating a longer period of isolation (Fellers *et al.* 1998).

The island night lizard is a medium-sized lizard (2.75 to 4 inches snout-vent length) with soft scales and folds of skin along the neck and sides of the body. The back is mottled with pale gray or beige and yellow-brown, darkened to varying degrees with black giving it a reticulated or netted pattern. Occasionally, individuals may have dark dorsolateral lines or a vertebral stripe. Some island night lizards have a bluish tinge on the belly changing to yellow on the underside of the tail. Color variations appear to differ between the islands but individuals tend to match the substrates they inhabit.

Despite the name, island night lizards are not nocturnal. They are most active at midday with little activity in the cool mornings or evenings and little, if any, activity at night. Activity peaks seasonally as well; island night lizards become active in spring during the mating season and activity subsides through the summer and fall. Young of the year may be active throughout the year, while adults display seasonal and daily variations in activity described.

Island night lizards become sexually mature in their third or fourth year. Unlike most reptiles, the island night lizard is viviparous, meaning that it bears live young that are nourished within the female. The females give birth to 3 to 9 young in September of each year following a 14-week gestation period. Researchers consider the species k-selected, meaning that they are slow-maturing, long-lived, with a low reproductive potential. Only half of the females give birth in a given year and even then only one brood is attempted. Fellers *et al.* (1998) estimate that some island night lizards may be more than 30 years old which is surprising for a reptile of its size.

Island night lizards inhabit a variety of habitats. They are most abundant in boxthorn and cactus scrub and rocky areas with fissures. These habitats provide protection from predatory birds which were the major source of mortality prior to the introduction of cats and rats to the islands. They also inhabit debris piles left by humans which may simulate the protected structure of shrublands or rock crevices.

In suitable habitat, island night lizards reach densities greater than any other ground-dwelling lizard that has been studied; up to 1,300 lizards per acre in boxthorn and 1,000 per acre in cactus scrub (Fellers and Drost 1991). These high densities are attributed to a low metabolic rate and associated lower energy demands, sedentary nature, and their ability to live on diverse foods. Island night lizards eat a wide variety of insects and spiders and they ingest a relatively large quantity of plant material for a lizard of their size. Consequently, home ranges overlap and a large number of island night lizards can occupy smaller areas.

This propensity to congregate in suitable habitat makes larger numbers of individual island night lizards susceptible to human activities. When debris is left adjacent to occupied habitat, island night lizards may move into the pile; when the debris is removed, many individuals could be injured or killed. Activities that remove stands of boxthorn or cactus scrub habitats may also affect large numbers of island night lizards. Other factors that threaten the island night lizard include: the introduction of non-native predators (*i.e.*, cats and rats); loss of habitat to development and grazing; introduction of non-native plants that displace boxthorn and cactus scrub habitats; direct mortality from vehicles; trampling by cattle and humans; and competition from introduced southern alligator lizards (*Elgaria multicarinata*). Human activities and non-native predators are the two greatest threats to the species.

Brown Pelican

The brown pelican was federally listed as endangered in 1970 (35 *Federal Register* 16047). The recovery plan describes the biology, reasons for decline, and the actions needed for recovery of the California brown pelican (Service 1983).

Brown pelicans are from 42 to 54 inches long and weigh from 8 to 10 pounds. Even though they have a 6.5- to 7.5-foot wingspan, brown pelicans are the smallest of the seven species in the pelican family (Pelecanidae). Adults have chestnut-and-white necks, white heads with pale yellow crowns, a brown-streaked back, rump, and tail, blackish-brown belly, grayish bill and pouch, and black legs and feet. They are rather clumsy on land and fly with their necks folded, heads resting on their backs, using slow, powerful wingbeats.

Adult brown pelicans are primarily fish eaters and require up to 4 pounds of fish per day. Their diet consists mainly of northern anchovy (*Engraulis mordax*), Pacific sardine (*Sardinopus sagax*), and other surface-schooling fish. Brown pelicans have also been known to eat some crustaceans, usually prawns. They have extremely keen eyesight and can spot a school of small fish, or even a single fish, from 60 to 70 feet above. To catch fish, they dive steeply into the water, where they may submerge completely or only partly depending on the height of the dive, and surface with a mouthful of fish. Air sacs beneath the skin cushion the impact and help it surface.

Brown pelicans are social and gregarious. Males and females, juveniles and adults, congregate in large flocks for much of the year. Brown pelicans nest in colonies on small coastal islands that are free of mammalian predators and human disturbance and are associated with an adequate and consistent food supply. Nesting colonies of the brown pelican on the Pacific coast range from the Channel Islands in the Southern California Bight to the islands off Nayarit, Mexico. Prior to 1959, intermittent nesting was observed as far north as Point Lobos in Monterey County, California. Currently in southern California, brown pelican colonies are found only on Anacapa and Santa Barbara islands; they do not nest on any of the other Channel Islands. The southern California population of brown pelicans today is estimated at 4,500 to 5,000 breeding pairs.

Dispersal between breeding seasons ranges from British Columbia, Canada, to southern Mexico and possibly to Central America. During the non-breeding season, which varies between colonies but typically extends from July to January, brown pelicans roost communally, generally in areas that are near adequate food supplies, have some type of physical barrier to predation and disturbance, and provide some protection from environmental stresses such as wind and high surf. Breakwaters and jetties are often used for roosting. Brown pelican numbers in a given area may vary greatly with the season.

Although nest predation may be a problem, adult brown pelicans have few natural enemies. Nests are sometimes destroyed by hurricanes, flooding, or other natural disasters; however, the biggest threat to brown pelican survival has historically been human activities. In the late 19th

and early 20th centuries, brown pelicans were hunted for their feathers, which adorned women's clothing, particularly hats. During the food shortages following World War I, fishermen claimed brown pelicans were decimating the commercial fishery resource and slaughtered them by the thousands. The nests were also frequently raided for eggs.

Brown pelicans experienced widespread reproductive failures in the 1960s and early 1970s. Much of the failure was attributed to eggshell thinning caused by high concentrations of DDE, a metabolite of DDT. Other factors implicated in the decline of this species include human disturbance at nesting colonies and food shortages. Brown pelicans have not nested north of the Channel Islands since the species' decline in the late 1950s and early 1960s. In 1972, the Environmental Protection Agency banned the use of DDT in the U.S. and placed restrictions on the use of other pesticides. Since then, the level of chemical contaminants in pelican eggs has decreased. Brown pelican nesting success has subsequently increased. The brown pelican was the first species to apparently recover from the effects of pesticides.

Western Snowy Plover

The Pacific coast population of the western snowy plover was federally listed as threatened on March 5, 1993 (58 *Federal Register* 12864), and critical habitat was designated on December 7, 1999 (64 *Federal Register* 68508).

A notice of availability of a draft recovery plan for the western snowy plover was published on August 14, 2001 (66 *Federal Register* 42676). The range of the western snowy plover is divided into six recovery units, with more than half of the breeding adults expected to exist in central and southern California. The recovery plan describes the actions needed to recover the western snowy plover to the point where populations are self-sustaining and the subspecies can be delisted. These actions include: monitoring and management of breeding and wintering habitat; establishment of working groups to prepare and implement management plans for the six recovery units; developing and testing new predator management techniques; improving monitoring of breeding success; public education; and working with Mexico to protect its western snowy plover populations and wintering habitat.

The western snowy plover is one of 12 subspecies of the snowy plover (*Charadrius alexandrinus*) in the family Charadriidae. The western snowy plover is a small, pale-colored shorebird with dark patches on either side of the upper breast. The bill and legs are blackish. Males have black head and breast markings in breeding plumage; in females, these markings are usually dark brown.

Western snowy plovers prefer sandy beaches that are relatively free from human disturbance and predation. Sandy beach habitat is unstable due to unconsolidated soils, high winds, storms, wave action, and colonization by plants. Sand spits, dune-backed beaches, beaches at creek and river mouths, and salt pans at lagoons and estuaries are the preferred habitats for nesting. The attributes considered essential to the conservation of the coastal population of the western snowy

plover can be found in the final rule for the designation of critical habitat (64 *Federal Register* 68508). The physical and biological features and primary constituent elements of critical habitat are provided by intertidal beaches (between mean low water and mean high tide), associated dune systems, and river estuaries. Important components of the beach/dune/estuarine ecosystem include surf-cast kelp, sparsely vegetated foredunes, interdunal flats, spits, washover areas, blowouts, intertidal flats, salt flats, and flat rocky outcrops. Several of these components (sparse vegetation, salt flats) are mimicked in artificial habitat types used less commonly by western snowy plovers (*i.e.*, dredge spoil sites and salt ponds and adjoining levees).

Western snowy plovers tend to be gregarious in winter. They are primarily visual foragers, feeding on invertebrates in the wet sand and surf-cast kelp within the intertidal zone, in dry, sandy areas above the high tide, on salt pans, on spoil sites, and along the edges of salt marshes, salt ponds, and lagoons.

The breeding season for western snowy plovers extends from March to late September, with birds at more southerly locations breeding earlier. Most nesting occurs on unvegetated or moderately vegetated, dune-backed beaches and sand spits. Other less common nesting habitats include salt pans, dredge spoils, and salt pond levees. Nest site fidelity is common, and mated birds from the previous breeding season frequently reunite. During courtship, males defend territories and usually make multiple scrapes. Females choose which scrape becomes the nest site by laying eggs (typically 3 but up to 6) in it. Both sexes incubate eggs, with the female tending to incubate during the day and the male at night (Warriner *et al.* 1986). Western snowy plovers often renest if eggs are lost. Hatching occurs throughout the subspecies' range from early April through mid-August, with chicks fledging approximately one month after hatching. Like its relatives, western snowy plover chicks are precocial, feeding on their own within hours of hatching. Adult western snowy plovers tend chicks while feeding, often using distraction displays to lure predators and people away from chicks. Females generally desert mates and broods by the sixth day after hatching, and thereafter the chicks are typically accompanied by only the male. While males rear broods, females obtain new mates and initiate new nests (Page and Persons 1995).

The Pacific coast population of the western snowy plover breeds primarily on coastal beaches from southern Washington to southern Baja California, Mexico. Historically, western snowy plovers bred or wintered at 157 locations on the Pacific coast, including 5 sites in Washington, 19 sites in Oregon, and 133 sites in California. In 1991, Page *et al.* estimated that only 1,200 to 1,900 adult western snowy plovers remained on the Pacific coast of the United States, and in 1995, approximately 1,000 western snowy plovers occurred in coastal California (Nur *et al*. 1999). Fewer than 40 adults are believed to be nesting in Washington, slightly more than 100 in coastal Oregon, and fewer than 100 in California north of the Golden Gate. Larger numbers were and are still found in southern and central California, at Monterey Bay (estimated 200 to 250 breeding adults), Morro Bay (estimated 85 to 93 breeding adults), Pismo Beach to Point Sal (estimated 130 to 246 breeding adults), Vandenberg Air Force Base (estimated 130 to 240 breeding adults), and the Oxnard Lowlands (estimated 69 to105 breeding adults). In California,

western snowy plovers also breed on San Nicolas and Santa Rosa islands, Bolsa Chica in Orange County, and along the coast of San Diego County. Probably as many western snowy plovers nest along the west coast of Baja California as along the Pacific coast of the United States (Palacios *et al.* 1994).

During the non-breeding season western snowy plovers may remain at breeding sites or may migrate to other locations. Most winter south of Bodega Bay, California. Many birds from the interior population winter on the central and southern coast of California.

The Pacific coast population of the western snowy plover has experienced widespread loss of nesting habitat and reduced reproductive success at many nesting locations due to urban development and the encroachment of European beachgrass (*Ammophila arenaria*). Human activities such as walking, jogging, unleashed pets, horseback riding, and off-road vehicles can destroy the western snowy plover's cryptic nests and chicks. These activities can also hinder foraging behavior, cause separation of adults and their chicks, and flush adults off nests and away from chicks, thereby interfering with essential incubation and chick-rearing behaviors. Predation by coyotes (*Canis latrans*), foxes (particularly red foxes [*Vulpes vulpes*] on the mainland and island foxes on the Channel Islands), skunks (*Mephitis mephitis*), common ravens (*Corvus corax*), gulls (*Larus* spp.) and raptors has been identified as a major factor limiting western snowy plover reproductive success at many Pacific coast sites.

The need for increased management of Pacific coast western snowy plovers and their habitats is recognized in a population viability analysis conducted for the western snowy plover (Nur *et al.* 1999). This analysis was conducted to aid the recovery team for the western snowy plover in developing recovery criteria. Its authors conclude that, "Under status quo scenarios, even with intensive management in some areas, the population is almost certain to decline" and "ceasing current management practices including area closures, predator control, and predator exclosures would be disastrous for the Pacific coast population." The recovery team has also identified population growth as a prerequisite to the recovery of the subspecies.

ENVIRONMENTAL BASELINE

San Nicolas Island is approximately 60 miles southwest of Point Mugu and covers 13,370 acres (Figure 1). It is approximately 9 miles long and 3.6 miles wide with 32 miles of shoreline. The island, generally treeless, is relatively flat on top and drops sharply off on the south side with a more gradual slope to the ocean on the north side. The interior terrain is a rolling mesa and the western end contains large shifting sand dunes. Thirteen vegetation communities have been identified on San Nicolas Island (Navy 2000). Five scrub communities, including caliche, isocoma, baccharis, lupinus, and coreopsis scrub comprise 7,349 acres of habitat. Barren areas that support no vegetation comprise 3,468 acres. Freshwater aquatic vegetation communities, coastal and inland dunes, and coastal marsh also occur. Of the 250 plant taxa present, 2 are endemic to San Nicolas Island.

Several terrestrial bird species nest on the island and large seabird rookeries are located along the western shore. Terrestrial mammals present include the San Nicolas Island fox, deer mouse (*Peromyscus maniculatus*), and introduced domestic cats (*Felis domesticus*). San Nicolas Island is an important refuge for several species of pinnipeds. Annually, more than 23,000 elephant seals (*Mirounga angustirostris*), 80,000 California sea lions (*Zalophus californianus*), and 500 harbor seals (*Phoca vitulina*) haul out on the beaches and rocky outcrops along the shoreline (Navy 2000).

Island Night Lizard

Island night lizards are generally distributed only over the eastern half of the island with the exception of a few isolated populations along the west end and southern shore (Figures 4 and 5). Where island night lizards occur, their numbers vary greatly. These variations seem to be related to habitat, as shown in the table below (Fellers *et al*. 1998). The grasslands that cover much of the eastern mesa support few or no island night lizards. Mixed shrub communities support moderate numbers of island night lizards. Cactus, boxthorn and boulder beach habitats support the greatest density of island night lizards. The San Nicolas Island population of island night lizards is estimated to be approximately 15,350 individuals (Fellers *et al.* 1998).

Table. Island night lizard population estimates by habitat type and a total number:

Habitat	Area (square meters)	Lizards/hectare	Population
Cactus	4,740	2,500	1,190
Boxthorn	500	3,200	160
Boulder beach	2,500	4,000	1,000
Mixed scrub	650,000	200	13,000
	Total island night lizards on San Nicolas Island (estimated)		15,350

Brown Pelican

Brown pelicans roost along the shoreline of San Nicolas Island throughout the year (Figure 6). Their abundance is variable throughout the year and from year to year, depending on oceanographic conditions. In terms of seasonal variations, total numbers are lowest in the period of February through May, highest in August through October, and at intermediate levels in early summer and early winter (Briggs *et al.* 1981). Aerial surveys conducted between June and September of 1992, and June and September of 1993, counted an average of 341 birds (Jacques *et al*. 1996).

Western Snowy Plover

Western snowy plovers occur on the island throughout the year (Figure 7). Seasonal use patterns are closely related to the movements of migrating individuals and success of the breeding population. Numbers are lowest at the beginning of the breeding season and increase in the fall

as wintering birds arrive. The results of annual breeding season surveys from 1978 through 2000 are shown below:

Year	Adult Total	Year	Adult Total
1978	133	1996	104
1989	90	1997	91
1991	78	1998	90
1993	111	1999	60
1994	74	2000	72
1995	116		

During the fall, numbers increase approximately 30 percent. On San Nicolas Island, 12 beaches, totaling 514 acres and 9.8 miles of shoreline, have been designated as critical habitat for this subspecies (Figure 8).

Western snowy plovers have nested in the area adjacent to the Building 807 launch complex since 1996 (Figure 8). Four to six nest initiations have been documented each year, with most nests being 700 to 1,400 feet from the launch facility (a notable exception being a nest adjacent to the access road, 300 feet from the launch facility in 2000). The area is not designated as critical habitat.

Western snowy plovers regularly forage and nest on the beach west of the barge landing area (Figure 9). All documented nests have been greater than 900 feet from the landing ramp with the exception of a nest reported along the access road in 1993 (Wehtje and Baron 1993). In 2000, a male with three chicks was observed in the operational area (Navy 2000). The brood likely migrated into the area from the western portion of Daytona Beach. An area of critical habitat for the western snowy plover is located 700 feet west of the operational area.

All of the amphibious landing locations, with the exception of the Daytona Beach site, are known to support nesting western snowy plovers. Wintering flocks also occur at Red Eye Beach, Tender Beach and Coast Guard Beach where amphibious landings may occur (Figure 7). Western snowy plovers may also nest or forage in proximity to the proposed pier construction site.

Western snowy plovers also use the pumping and discharge areas (the brine pond) at the desalination plant year-round (Figure 10). The beach is exposed to the prevailing northwest winds, and winds in excess of 25 miles per hour, blowing parallel with the beach, are not uncommon. Not surprisingly, western snowy plovers use of this beach is related to wind intensity and direction. The beach is also subject to overwash during periods of extreme tidal fluctuation or storm events. In 1993, five nesting attempts by western snowy plovers were documented in the area. Of these, three hatched successfully. The other two clutches were lost, probably as a result of exposure to high winds (Wehtje and Baron 1993). In 1997, four nesting attempts were documented; three hatched successfully, one was abandoned, probably as a result of high winds. In 2000, only one nest was observed in the area. The nest was later abandoned

for unknown reasons (Navy 2000). A portion of this area around the desalination plant is designated as critical habitat for the subspecies.
Of the 12 locations where western snowy plovers regularly nest on San Nicolas Island (Figure 7), 9 are on beaches that may be visited by personnel during recreational activities. During the non-breeding season, western snowy plovers tend to congregate at four locations which could be visited by fishermen or beach goers. Western snowy plovers also roost, forage, and nest on Red Eye Beach which is approximately 5,000 feet northwest of the explosive ordnance disposal area.

EFFECTS OF THE ACTIONS

Some of the effects of activities at San Nicolas Island on listed species are difficult to document. For example, the effects on listed species of noise from missile launches have not been documented; however, the literature on the effects of aircraft noise on wildlife allows us to reasonably conclude that such effects have occurred and are occurring under current operations (Gladwin *et al.* 1987, Manci *et al.* 1988). Given current biological knowledge and documented responses of wildlife to human activities, we can predict that the listed species on San Nicolas Island are affected directly, indirectly, temporarily, and permanently in the following manner by Navy activities.

Missile and Target Launches

The effect of missile and target launches on listed birds at San Nicolas Island has not been specifically demonstrated. The best information available is data obtained during launches at Vandenberg Air Force Base (VAFB). For example, the findings made during the launch of a Lockheed launch vehicle from pad SLC-6 at VAFB support other observations that western snowy plovers crouch and observe objects, such as helicopters or launch vehicles that "mimic" avian predators (Lockheed Environmental System and Technologies 1995). During launch monitoring at VAFB in 1997, researchers found that western snowy plovers near pad SLC-2 flushed at launch but returned to normal behavior soon after the Delta II launches. Monitors observing western snowy plovers during a launch at pad SLC-4W at VAFB in 1998 did not observe any adverse effects on 12 of 13 nests. However, one of the three eggs in the nest closest to SLC-4W was found to be broken after the launch. In 1999, nesting western snowy plovers were monitored on Surf and Wall Beaches at VAFB during the launch of an Athena 2 rocket from pad SLC-6. No western snowy plovers flushed and no eggs were disturbed as a result of the launch (Lockheed Martin Environmental Services 1999). A consultant to VAFB, BioResources, stated that western snowy plover reproductive success does not appear to be affected by launches, even in the SLC-2 area where Delta II space vehicles are launched within approximately 0.5 mile of nesting western snowy plovers (BioResources 2000).

According to the biological assessment (Navy 2000), missile launches can produce noise levels comparable to a loud factory (approximately 100 dBA). The threshold of pain in terms of human perception is 120 dBA; normal conversation is approximately 60 dBA (Manci *et al.* 1988). The potential effects of loud noises are: (a) birds are displaced from active nests, exposing eggs or

young to predation and environmental stress (heat or cold); (b) excessively loud sounds may cause permanent hearing damage, thus interfering with an individual's ability to function; (c) the stress of a noisy environment may lead to physiological changes that lower reproductive success and eliminate otherwise suitable habitat as a nesting area; and (d) the flush response by adults may result in damage to eggs.
Brown pelicans roost on the west end of the island in proximity to the Building 807 Launch Complex within the Vandal 100 dBA acoustical contour. These birds may be flushed from roosting sites by missile and target launches; however, the effects are likely to be minimal as the brown pelicans return to the roost or find another site nearby shortly after each event (Navy 2000). Brown pelicans do not nest on San Nicolas Island (Service 1983) so we do not anticipate that the launches will affect breeding.

Western snowy plovers nest in the Building 807 Launch Complex area and are disturbed by the launches and human activity around the facility. If the birds are flushed from their nests during unfavorable weather or if predators are nearby, the nests or young could be lost during this disturbance. Unfavorable weather includes rain (Flemming *et al.* 1988), windspeed over 10 miles per hour at which sand is mobilized (Environment Australia 2001), and temperatures above approximately 85 or below 70 degrees fehrenheit for eggs exposed for more than half an hour (Hill and Talent 1990). The launches from either facility are not expected to affect any designated critical habitat for the western snowy plover because they will not alter the primary constituent elements. The Navy proposal to compact 2,500 square feet of the substrate to discourage nesting will remove a potential nesting site but will ultimately protect the western snowy plover from mortality or disturbance and failed nesting attempts. More suitable nesting locations are found elsewhere on the island and could support more western snowy plovers.

Island night lizards are not likely to be affected by the launching activities. They do not generally occur in the launch areas.

Barge Operations

In a letter sent to the Navy dated July 9, 1997, we noted that western snowy plovers have not attempted to nest at the barge landing location since 1993 and that increasing use of the beach by pinnipeds has reduced the value of the location as nesting habitat. Also, we recognized that the beach is narrowing and is frequently inundated by high tides which would destroy any nests. The biological assessment (Navy 2000) further states that the nearest nesting location is more than 900 feet from the landing ramp, although foraging individuals occasionally appear in the barge landing area, and the nearest critical habitat is approximately 700 feet to the west (Figure 9). Based upon this information, we concurred with the Navy's conclusion that the continued operation of the barge landing is not likely to adversely affect western snowy plovers.

Because the barges come from the mainland, the potential exists that non-native plant and animal species could be transported to San Nicolas Island. If established, such non-native species may degrade habitat for the western snowy plover and island night lizard or introduced animals may prey directly upon these species. The Navy has proposed to clean and inspect all equipment,

vehicles, and supplies to reduce the potential for such introductions; however, such measures may not always be sufficient to prevent plant propagules or animals from reaching the island.

Brown pelicans may be flushed from roosting and foraging areas near the barge landing. Because considerable suitable habitat for brown pelicans exists around San Nicolas Island, this temporary displacement will not substantially affect the population of brown pelicans.

Proposed Pier Construction

The pier would be constructed in the current barge landing area, and its construction is not expected to affect the western snowy plover or its critical habitat for the reasons cited above in the barge landing discussion. Also, the Navy has proposed to stop construction if western snowy plovers are discovered within 1,200 feet of the site. However, the new pier may provide new perches for predatory birds that will use the high position to prey upon western snowy plovers and their chicks foraging on Daytona Beach or nearby.

The island night lizard occurs in the vicinity and individuals could be killed during the removal or replacement of existing structures at the staging area, improvement of the road to the landing site, and extension of utilities to the facility. The construction of new roads and installation of utilities could remove habitat for the species.

Reverse Osmosis Plant Operation

Western snowy plovers nesting on Coast Guard Beach are sometimes disturbed by the maintenance activities at the existing reverse osmosis plant. Because the plant is on the northwest side of the island, it is subject to prevailing winds sometimes exceeding 25 miles per hour. If western snowy plovers are displaced from their nests, eggs could get covered by blowing sand, or temperatures could be such that the eggs get too cold or too hot, resulting in mortality. Because western snowy plovers have nested in the vicinity of brine pond, overflow during peak periods of water treatment could flood nests.

The modernization of the desalination system will reduce the number of visits to the station to once per year, thus substantially reducing the effects of the maintenance. The Navy proposes to make the needed repairs and get the new system operating outside of the western snowy plover breeding season, so adverse effects to the species that could result from repairs will be avoided. Western snowy plovers that are wintering in the area may be displaced by the construction; however, considerable suitable habitat for western snowy plovers exists around San Nicolas Island, the temporary displacement will not diminish the population.

The Navy is uncertain when the new system will become functional; in the meantime, the old system and maintenance schedule remain in effect. If the new system is repaired and future maintenance occurs during the non-breeding season as proposed, we do not anticipate any effects from this activity; however, the brine pond overflow problem remains. Because the brine pond

will fill as it has in the past, any western snowy plovers attempting to nest there may be displaced. The number of birds so affected is likely to be low as no more than one nest has been attempted at the brine pond site in any given year (Navy 2000); most western snowy plover nests are located near the pumping station.
Island night lizards and brown pelicans do not occur in the vicinity of the desalination plant.

Equipment/Materials Storage and Staging Areas

Island night lizards may be affected by the placement, and subsequent removal, of equipment and materials. The Public Works Storage Yard is generally low quality habitat for the island night lizard; most of the yard itself is devoid of vegetation. However, the adjacent vegetation is predominantly native, including a 2,000-square foot area of cactus which is high quality habitat. Individual island night lizards may be killed when materials are removed or set in place, especially when the materials sit for extended periods and the island night lizards use the area as substitute habitat because of its structure. The Navy proposes to locate future storage and staging areas in areas of low island night lizard density to minimize the potential for mortality or injury of island night lizards.

The temporary staging areas are in areas of low quality habitat with the exception of the largest site. It is situated in an area of generally moderate quality habitat and in close proximity to an area representing prime habitat for the island night lizard. Its proximity to good habitat means that island night lizards will be attracted to the structure provided by the materials and possibly killed or injured when the materials are moved.

The Navy has proposed relocating individual island night lizards from storage and staging areas prior to removal of equipment and materials. Generally, moving island night lizards from storage and staging areas should reduce the number of individuals that are killed or injured during the removal of equipment and materials. However, some island night lizards could be killed or injured while being captured or transported to release areas; released individuals may be more susceptible to competition from resident island night lizards or predation because of their unfamiliarity with new habitats. Some potential exists that resident island night lizards could experience greater difficulty in finding food or shelter with the increase in numbers. The degree of such an effect would depend upon the number of island night lizards released into an area, but it is likely to be low given the small total area of the staging and storage areas and the abundance of more suitable habitat outside of the staging and storage areas.

We note that the Navy has proposed to remove island night lizards from storage and staging areas by using biologists with recovery permits issued pursuant to section 10(a)(1)(A) of the Act. The use of recovery permits to remove island night lizards from work areas is not necessary and could possibly violate the intent of section 7(a)(2) of the Act. The Service can provide the Navy the authority to relocate island night lizards from work areas through a biological opinion if the Service concludes that the Navy's proposed activity is not likely to jeopardize the continued existence of the species.

Brown pelicans and western snowy plovers occur at the shoreline and not in the inland areas where the permanent and temporary storage areas are located.

Debris Removal

Because island night lizards often use man-made materials for shelter, they are subject to mortality or injury when the materials are removed. The number of island night lizards that may be killed or injured by debris removal and relocation is likely to be low because the debris piles are small in relation to the suitable habitat for the species. The Navy has proposed relocating individual island night lizards from debris piles prior to removal. The potential effects of removing and relocating materials were discussed in the previous section of this biological opinion and apply similarly to this activity.

Roadside Maintenance

Island night lizards may be killed or injured during the mowing and maintenance of roadsides. The area affected and the number of island night lizards affected would be relatively small given the population estimate of 15,300 individuals and the measures to minimize mowing in high quality habitat. To minimize the effects, the Navy has proposed to avoid mowing in areas where island night lizard density is likely to be highest (*i.e.*, cactus scrub and boxthorn). This may reduce the numbers of island night lizards killed; however, some mortality is likely.

Recreation

Much of the recreation on San Nicolas Island is likely to occur on beaches where western snowy plovers nest. Of the 12 known nesting locations, 9 are areas where recreation may be pursued (Figure 7). Human activity is known to disturb western snowy plovers to the extent that nests may be abandoned, temporarily making eggs and nestlings more susceptible to predation or the effects of weather. The potential exists for direct destruction of nests as they are cryptic and easily overlooked by casual observers. Nests in areas where human activity is not controlled are often crushed. The potential effects from recreation on western snowy plovers is minimized by seasonal beach closures to protect nesting birds.

Recreation at San Nicolas Island may cause brown pelicans to be flushed from roosting areas or interrupted while foraging; however, these disturbances are temporary and would not likely preclude brown pelicans from finding suitable roosting and foraging areas nearby. Consequently, the effects of recreation on brown pelicans would be minimal.

Island night lizards occur away from most areas where recreation is likely to occur. We anticipate that recreation would have minimal, if any, effects on this species.

Natural Resource Management and Research

Brown pelicans may be flushed from roost sites during the periodic monitoring, restoration, weed removal, clean up, and cultural resource surveys. However, this disturbance is unlikely to be severe enough to result in mortality or injury because the brown pelicans typically fly off to

another location to roost or forage, and roosting and foraging sites are not limited at San Nicolas Island.
Western snowy plovers may be flushed from nest sites during monitoring which may result in the loss of eggs or young. This is more of a problem during inclement weather (*e.g.*, cold, windy, hot). Disturbance may also cause the separation of young from adults and may make the young susceptible to predation. The number of western snowy plovers affected is dependent upon the number of nests and young present and conditions during monitoring.

Habitat restoration work (ongoing and proposed) has the potential to improve habitat for the island night lizard and thus may benefit this species. Cleanup activities to improve habitat for island night lizards may result in some injury or mortality. The Navy has proposed to relocate any island night lizards that have taken up residence in areas to be cleaned. This may reduce the numbers of island night lizards killed; however, some mortality is likely. The area affected and the number of island night lizards affected would be relatively small given the abundance of suitable habitat and the population estimate of 15,300 individuals. Other research involving the island night lizard must be authorized under section 10(a)(1)(A) of the Act and the effects of those activities are not considered in this biological opinion.

Amphibious Training Exercises

All of the beaches where amphibious training exercises take place, with the exception of Daytona Beach, support nesting western snowy plovers. The effects of amphibious training exercises would be avoided by the Navy's proposal to close all beaches where western snowy plovers nest to the training for the entire western snowy plover breeding season.

Amphibious training exercises may cause brown pelicans to be flushed from roosting areas or interrupted while foraging; however, these disturbances are temporary and would not likely preclude brown pelicans from finding suitable roosting and foraging areas nearby. Consequently, the effects of recreation on brown pelicans would be minimal.

The amphibious training exercises take place on beaches where the island night lizard does not occur, so effects to this species from this activity are avoided. During the assault on the airfield, some island night lizards may be killed or injured; however, the airfield is not good habitat for the species and few instances of injury or mortality are expected.

Explosive Ordnance Disposal

If any EOD activities take place prior to the proposed relocation of the facility, and depending upon the size of the charges used in disposing or ordnance, the sound and concussive shock from the explosions at the current EOD site may disrupt the nesting of western snowy plovers on Red Eye Beach and near the Building 807 Launch Complex. Birds flushed from their nests leave eggs and young vulnerable to weather and predation. The number that could be affected depends upon the number of nests within the range of effects of the explosions, the size of charges, and current weather conditions. We believe the number affected would be low based upon previous

Navy experience with the EOD program and monitoring of western snowy plover nest locations that have not shown a direct correlation between the activity and nest abandonment (Navy 2000).

EOD activities could also flush roosting brown pelicans from the Vizcaino Point area. This disturbance would be temporary and would not likely preclude brown pelicans from finding suitable roosting and foraging areas nearby. Consequently, the effects of current EOD actions on brown pelicans would be minimal. The effects of the current EOD actions on island night lizards is also expected to be minimal because there is no evidence that reptiles respond strongly to loud sounds (Gladwin *et al*. 1987).

The Navy proposes to relocate the EOD site to an area where it will not have effects on any listed species or critical habitat; however, no timeline for such relocation is proposed nor does the Navy provide any information on how this will be determined. If sited correctly, activities at the relocated facility could avoid adverse effects on the western snowy plover or brown pelican because the facility could be moved inland away from where these species occur. Without further data on maximum charge size and distance to sensitive receptors, it is impossible to predict that complete avoidance of effects will be achieved.

If the Navy is able to relocate the EOD facility outside of island night lizard habitat, no effects to this species are expected. Loss of habitat and mortality of island night lizards may occur if the new EOD facility is placed within suitable habitat for the species. The number of island night lizards affected depends upon the habitat type, as the density of island night lizards varies with habitat, and may vary as individuals move in and out of construction areas.

Proposed Multi-purpose Instrumentation Site Construction

Island night lizards occur in the areas currently proposed for construction of the multi-purpose instrumentation facilities (pads and access roads). The areas generally support low quality lizard habitat so that the number of island night lizards affected will be less than if the facilities were placed in high quality habitat where island night lizards are found in greater densities. Because the proposed project sites are not in areas where island night lizards are absent, individuals will likely be killed or injured during site preparation and usage (*i.e.*, vehicle access, foot traffic).

The western snowy plover and the brown pelican do not occur in the area of the existing instrumentation facilities, nor are they likely to occur in the areas of the proposed facilities.

Routine Small Construction Projects and Utilities Maintenance

Because small construction projects and utilities maintenance may occur in all habitat types on San Nicolas Island, all three listed species addressed in this biological opinion could be affected. The island night lizard would be the species most affected because the majority of the small projects and maintenance occur away from the shoreline areas. Island night lizards will likely be killed or injured by site preparation and the movement of vehicles, and the excavation of utilities will remove habitat for the species. The number of island night lizards affected will vary

depending upon habitat type because the species' density varies among the different habitats found on San Nicolas Island; all other factors being equal, in habitats where the individuals exist more densely, more are likely to be killed than in an area where the habitat supports a lower density of island night lizards. The Navy proposes to survey potential construction sites and utilities for island night lizards prior to the activity and remove individuals to safe habitat. This relocation may cause injury or mortality through handling, introduction into unfamiliar territory, or competition with resident island night lizards.

If routine small construction and utilities maintenance activities take place on the beaches where western snowy plover nest, the projects could result in the loss of nests or young through direct destruction or as a result of adults being flushed from nests or young under unfavorable conditions making them susceptible to predation or weather. The scale of the disturbance depends upon the number of nests in the vicinity. In areas where western snowy plovers do not nest, no effects are expected. Brown pelicans may be flushed from roost sites; however, these disturbances would be temporary and would not likely preclude brown pelicans from finding suitable roosting and foraging areas nearby. Consequently, the effects of routine small construction projects and utilities maintenance on brown pelicans would be minimal.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act. We do not anticipate any cumulative effects on San Nicolas Island because it is federal land and all discretionary activities that the Navy undertakes there are subject to the requirements of section 7(a)(2) of the Act.

CONCLUSION

After reviewing the current status of the island night lizard, brown pelican, and western snowy plover, the environmental baseline for San Nicolas Island, the effects of the proposed and ongoing activities, and the cumulative effects, it is the Service's biological opinion that the thirteen activities discussed in this biological opinion are not likely to jeopardize the continued existence of the brown pelican, western snowy plover, and island night lizard, and are not likely to destroy or adversely modify designated critical habitat for the western snowy plover. We base these conclusions on the following:

Island Night Lizard

1. The Navy has proposed measures to avoid and minimize adverse effects to the island night lizard.

2. The Navy is proposing to restore disturbed areas to high quality habitat for the island night lizard which should increase its numbers on San Nicolas Island.

3. The Navy's current and future activities on San Nicolas Island will affect only small areas of the species' habitat. High quality habitat that supports the greatest densities would be avoided.

Brown Pelican

1. Brown pelicans do not nest at San Nicolas Island, so any effects to the species are not likely to reduce its breeding success.

2. The Navy has proposed measures to avoid and minimize adverse effects to the brown pelican.

3. The low potential for adverse effects to the species are not likely to reduce the population substantially.

Western Snowy Plover

1. The Navy has implemented and proposes additional measures to avoid and minimize direct effects to western snowy plovers caused by the ongoing activities.

2. The western snowy plover population at San Nicolas Island represents a small portion of the subspecies' distribution. Additionally, the effects are not likely to reduce the overall population or degrade the status of the species at San Nicolas Island.

3. The Navy's activities will not appreciably reduce the ability of the designated critical habitat on San Nicolas Island to support the survival and recovery of the western snowy plover because most disturbances would be temporary and the primary constituent elements would continue to support nesting, foraging, and roosting.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species by annoying it to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and

not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this incidental take statement.
The measures described below are non-discretionary, and must be undertaken by the Navy or made binding conditions of any contract or permit issued by the Navy, as appropriate, for the exemption in section 7(o)(2) to apply. The Navy has a continuing duty to regulate the activities covered by this incidental take statement. If the Navy fails to assume and implement the terms and conditions of the incidental take statement, or make them binding conditions of any contract it issues, the protective coverage of section 7(o)(2) may lapse. To monitor the impact of incidental take, the Navy must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement [50 CFR §402.14(i)(3)].

The take of any listed species as a result of trespass onto beaches during closures or in violation of posted warnings is not considered incidental because these actions are either in violation of posted or stated prohibitions on San Nicolas Island or they are outside of the standard operation procedures as described to the Service in the biological assessment (Navy 2000). Any take resulting from trespass in violation of posted beach closures may be considered a violation of section 9 of the Act.

Island Night Lizard - Island night lizards are widely scattered throughout San Nicolas Island; however, their density varies with habitat types. The activities listed in the project description may cause the injury or death of individuals, but the number affected would depend upon the type of habitat in proximity to the activity and the size of the project. Because both of these factors vary unpredictably, the number of individual island night lizards that could be taken by the Navy's activities cannot be accurately predicted.

The Navy shall contact the Service whenever the number of dead island night lizards found in a given year reaches five, and the cause of death or injury is unknown or may be due to Navy activities. Provided that protective measures proposed by the Navy and the terms and conditions of this biological opinion are being fully implemented, operations need not cease while the cause of mortality is being determined. Once the cause of death or injury has been determined, the Service and Navy shall decide whether any additional protective measures are required to address the cause of the loss of the island night lizard.

Brown Pelican - The number of brown pelicans observed at San Nicolas Island at any given time is the combined result of breeding success elsewhere, weather, and seasonal changes in their movements, such that changes in numbers at San Nicolas Island cannot be reliably attributed to Navy actions. Based upon the information presented by the Navy, we anticipate that few, if any, brown pelicans will be killed or injured at San Nicolas Island in any given year. Estimating a precise number is impossible because of the variation in numbers of brown pelicans at San Nicolas Island at any one time, the varying levels of human activity, and the potential difficulty in determining whether any dead bird that is found died of natural causes or the Navy's activities.

The Navy shall contact the Service whenever a dead or injured brown pelican is found and the cause of death or injury shall be determined. Provided that the protective measures proposed by the Navy and the terms and conditions of this biological opinion are being fully implemented, operations need not cease while the cause of death is being determined. Once the cause of death or injury has been determined, the Service and Navy shall decide whether any additional protective measures are required to address the cause of the loss of the brown pelican.

Western Snowy Plover - The western snowy plover is a small, cryptically-colored bird that would be difficult to find were it not for its movement. Finding dead or injured individuals is also difficult. The seasonal presence of this species is complex, in that breeding individuals and their young are present in spring and summer and are replaced by migratory or wintering individuals in fall and winter, with overlap between the two populations. Changes in numbers at San Nicolas Island can be attributed to several factors, not solely to the Navy's activities, although instances in which harassment may have occurred (*e.g.*, flushing birds from nests) have been observed or inferred from monitoring. Nest success or failure is difficult to calculate from the data gathered; ascribing reasons for failure when it does occur is also often difficult.

Based upon the information presented by the Navy, we anticipate that few, if any, western snowy plovers will be killed or injured at San Nicolas Island in any given year. Estimating a precise number is impossible because of the variation in numbers of western snowy plovers at San Nicolas Island at any one time, the varying levels of human activity, and the potential difficulty in determining whether any dead bird that is found died of natural causes or the Navy's activities.

The Navy shall contact the Service whenever a dead or injured western snowy plover or an abandoned nest is found and the cause of death or injury is unknown or may be due to Navy activities. Provided that protective measures proposed by the Navy and the terms and conditions of this biological opinion are being fully implemented, operations need not cease while the cause of mortality is being determined. Once the cause of death or injury has been determined, the Service and Navy shall decide whether any additional protective measures are required to address the cause of the loss of the western snowy plover or its nest.

REASONABLE AND PRUDENT MEASURES

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize take of the island night lizard, brown pelican, and western snowy plover:

1. All relocation of island night lizards shall be conducted by a biologist authorized by the Service. The authorized biologist shall provide all information pertinent to the relocation.
2. Censuses of listed species for the purpose of monitoring the effects of Navy activities on these species shall be performed by biologists authorized by the Service. The methods used for censusing shall follow strict procedural guidelines to reduce the chances of disturbance.

3. Western snowy plover nests shall be monitored during missile or target launches, EOD activities, barge landings, and other activities that may disturb nesting western snowy plovers to determine the subspecies' response.
4. Areas closed during road maintenance and other activities to prevent mortality of island night lizards shall be clearly marked.

5. Relocation of the EOD facility shall consider the information on effects gathered from similar activities at the Navy Base Ventura County.

6. The EPO shall review all existing and new structures to determine which shall be fitted with materials to prevent their use as perches by predatory birds.

7. The barge landing area and other areas of concentrated human activity shall be monitored for non-native species. Any such species found shall be removed.

TERMS AND CONDITIONS

To be exempt from the prohibitions of section 9 of the Act, the Navy must comply with, or ensure that any contractor complies with, the following terms and conditions which implement the reasonable and prudent measures described above, and outline reporting and monitoring requirements. These terms and conditions are non-discretionary.

The following terms and conditions implement reasonable and prudent measure 1:

1. At least 30 days prior to relocating any island night lizards, the Navy shall contact the Service and request approval of (a) biologist(s) who will capture and relocate any island night lizards that could be killed or injured by Navy activities. Qualified individuals shall have demonstrable experience in handling reptiles and knowledge of the biology of the island night lizard.

2. The authorized biologist(s) shall record all pertinent information when island night lizards are relocated, including the number of individuals captured, site of capture, site of relocation, habitat at capture and release sites, snout-to-vent length, sex, if possible, and number of mortalities resulting from relocation and from the activity for which relocation was implemented.

The following terms and conditions implement reasonable and prudent measure 2:

3. Individuals who will be performing monitoring and censusing of western snowy plover and island night lizard for the purposes of determining the effects of Navy activities on these species shall be authorized by the Service at least 30 days prior to the onset of such activities. This authorization will not include research activities that require possession

of a permit pursuant to section 10(a)(1)(A) of the Act, such as age class studies or nest monitoring where eggs are handled.

4. During censusing or observation of western snowy plovers, biologists shall follow these guidelines:
    1. Monitors must remain at least 100 feet from the nests.

    2. Censuses shall not be conducted when wind speeds exceed 10 mph maximum, if it is raining, or temperatures are below 70 or above 85 degrees fahrenheit.

5. During censusing of island night lizards, authorized biologists shall follow these precautions:
    1. Other than handling authorized under this biological opinion for relocation out of harm's way, the species shall not be captured. Capture for research purposes can only be conducted by a biologist with a current recovery permit issued pursuant to section 10(a)(1)(A) of the Act or as authorized under reasonable and prudent measure number 1.

    2. Debris or cover moved to find island night lizards shall be replaced in the exact location and position in which it was originally.

    3. Biologists shall not enter island night lizard habitat in vehicles except to travel on established roads. All surveys shall be conducted on foot with care taken to avoid stepping on individual island night lizards.

The following terms and conditions implement reasonable and prudent measure 3:

6. No more than two hours prior to missile or target launches or any other activities that could disturb nesting western snowy plovers, the EPO shall observe the nests from at least 100 feet to determine the status of the nesting activity (i.e., eggs present, adults on nest, etc.). Immediately after the missile or target launch or other activity, the nests shall be observed again to ascertain whether any disturbance has occurred or the status of the nests have been altered by the activity.

7. The results of such monitoring shall be reported to the Service annually unless the disturbance results in the loss of an adult, young, or eggs, in which case the results shall be reported immediately.
8. Activities that may displace adult western snowy plovers from their nests for more than ½ hour shall not take place when winds exceed 10 mph, or temperatures are below 70 degrees fehrenheit or above 85 degrees fehrenheit, or if it is raining.

The following terms and conditions implement reasonable and prudent measure 4:

9. Low signs (less than 3 feet) shall be permanently installed along the roads in high quality island night lizard habitat, as determined by the EPO, to warn of the restrictions on roadside maintenance.

10. Areas within high quality habitat for the island night lizard to be closed to roadside maintenance shall be marked with bright flagging or similar material by the EPO during maintenance to prevent accidental intrusion. Flagging shall be removed immediately after maintenance has been completed in that stretch of the habitat.

11. The limits of all construction areas or areas where disturbance of island night lizard habitat will occur shall be delineated with bright flagging or fencing to minimize the amount of habitat loss. Equipment, personnel, and vegetation removal shall not operate beyond the limits defined by the flagging or fencing. Materials used to delineate the construction area boundaries shall be removed immediately after project completion.

The following terms and conditions implement reasonable and prudent measure 5:

12. The placement of the new EOD facility shall be coordinated with the Service to ensure that explosive ordnance activities will no longer affect nesting western snowy plovers. The new facility shall be located at least 2,000 feet from the nearest western snowy plover nesting area and critical habitat. Any new EOD structures shall be oriented so that the sound and concussive shock is directed toward the middle of the island to further reduce the potential effects on western snowy plovers.

13. Detonations shall be tamped under sand and insulated with sandbags to minimize the sound and concussive shock.

14. Charges shall be limited to 2 pounds maximum unless the Navy can demonstrate that larger charges at 2,000 feet and with tamping and structure orientation will not cause a response in nesting western snowy plovers. Any effects from testing larger charges is not considered in this biological opinion and must be addressed as a separate consultation.

The following terms and conditions implement reasonable and prudent measure 6:

15. The EPO shall conduct surveys of all existing and future structures to determine if they may serve as perches for birds that could prey upon western snowy plovers. The structures determined to provide a view of the western snowy plover nesting areas shall be mapped.
16. All structures mapped as providing a view of western snowy plover nesting areas shall be fitted with Nix-a-lite® or a similar material to discourage perching by predatory birds. This does not include structures where installation of anti-perching materials would interfere with their function.

17. Structures or materials that are not permanent and may provide a perch for predatory birds in view of western snowy plover nesting areas shall be removed. The removal of these structures or materials shall follow the other terms and conditions intended to reduce the take of island night lizards, and shall be conducted outside of the western snowy plover nesting season.

The following terms and conditions implement reasonable and prudent measure 7:

18. The barge landing site, storage and staging areas, and all other areas where human activities are concentrated or where materials from the mainland are stored shall be surveyed by the EPO once per year to determine if any non-native plant or animal species have been introduced to San Nicolas Island. The location and species of the non-native plant or animal shall be recorded. Upon discovery, the non-native species shall be removed to the best of the Navy's ability.

REPORTING REQUIREMENTS

The Navy shall provide a written annual report to the Service by January 31 of each year that this biological opinion is in effect. The report shall document the number of island night lizards, brown pelicans, or western snowy killed or injured by the Navy's activities. The report shall also provide a summary of the previous year's activities and their effects on listed species. The report shall contain information on the following: (1) type of activities (*e.g.*, number of missile or target launches, new construction, debris removal, etc.); (2) location of activities; (3) a description of the habitat in which new construction or debris removal has occurred; (4) the species and number of listed species affected; (5) steps taken to avoid or minimize effects; (6) the number of any island night lizards relocated (as defined in reasonable and prudent measure 1); (7) the species and ultimate action taken upon discovery of a non-native plant or animal; (8) the nature of any research conducted on San Nicolas Island by the Navy or outside researchers; (9) the results of any censuses of brown pelicans, western snowy plovers, and island night lizards conducted on San Nicolas Island in the previous year; and (10) any other pertinent information as required by this biological opinion. The first report, although it will not cover all of 2001, is due approximately January 31, 2002.

DISPOSITION OF DEAD OR INJURED SPECIMENS

Upon locating a dead or injured island night lizard, brown pelican, or western snowy plover, initial notification must be made in writing to the Service's Division of Law Enforcement in Torrance, California (370 Amapola Avenue, Suite 114, Torrance, California 90501) and by telephone and writing to the Ventura Fish and Wildlife Office in Ventura, California, (2493 Portola Road, Suite B, Ventura, California 93003, (805) 644-1766) within three working days of the finding. The report shall include the date, time, location of the carcass, a photograph, cause of death, if known, and any other pertinent information.

Care shall be taken in handling dead specimens to preserve biological material in the best possible state for later analysis. Should any injured birds or island night lizards survive, the

Service should be contacted regarding their final disposition. The remains of intact island night lizards shall be placed with the University of California at Santa Barbara [Contact: Mark Holmgren, University of California at Santa Barbara, EEMB Department, Santa Barbara, California, 93106, (805) 893-4098]. Arrangements regarding proper disposition of potential museum specimens shall be made with the University of California by the EPO prior to implementation of any actions. The remains of intact western snowy plovers and brown pelicans shall be placed with the Western Foundation of Vertebrate Zoology [Contact: René Corrado, 439 Calle San Pablo, Camarillo, California, (805) 388-9944]. Arrangements regarding proper disposition of potential museum specimens shall be made with the Western Foundation by the EPO prior to implementation of any actions.

In the case of take or suspected take of listed species not exempted in this opinion, the Ventura Fish and Wildlife Office shall be notified within 24 hours.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to use their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. We recommend the following measures:

1. The island fox is found on most of the Channel Islands; however, its numbers are decreasing at alarming rates on many of the islands with the notable exception of San Nicolas Island. The Navy should allow researchers access to San Nicolas Island to study the species there and to evaluate the factors that maintain the population.

2. Personnel on San Nicolas Island should be prohibited from bringing domestic pets (*i.e.*, cats, dogs, rats, snakes, etc.) onto the island. Any domestic animals on San Nicolas Island currently should be removed to the mainland until the owners can claim them. Feral cats should be caught and deposited at the Camarillo Animal Shelter.

3. EPO personnel who will be performing research activities with listed species not described in the terms and conditions section of this biological opinion should apply for permits pursuant to section 10(a)(1)(A) of the Act.

The Service requests notification of the implementation of any conservation recommendations so we may be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats.

REINITIATION NOTICE

This concludes formal consultation on the ongoing activities and some future activities being conducted by the Navy on San Nicolas Island. These activities include: missile and target

launches; barge operations; proposed pier construction; reverse osmosis plant operations; equipment/materials storage and staging; debris removal; roadside maintenance; recreation; natural resource research and management; amphibious training exercises; explosive ordnance disposal; routine small construction project and utilities maintenance; and protective measures proposed to reduce effects on listed species . As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

If you have any questions or concerns, please call Rick Farris of my staff at (805) 644-1766.

Sincerely,

/s/Carl Benz Acting for
Diane K. Noda
Field Supervisor

REFERENCES

BioResources. 2000. Results of western snowy plover monitoring for the March 25 Delta II SLV launch from SLC-2 on Vandenberg Air Force Base, California. Los Osos, California.

Briggs, K.T., D.B. Lewis, W.B. Tyler, and G.L. Hunt. 1981. Brown pelicans in southern California: habitat use and environmental fluctuations. Condor 83:1-15.

Department of the Navy. 2000. Final Programmatic Biological Assessment, San Nicolas Island. Naval Air Warfare Center Weapons Division, China Lake, California.

Environment Australia. 2001. Windblown Sediment Transport. World Wide Web Environment Australia. <http://www.ea.gov.au/coasts/information/reports/nswmanual/appendixb9>.

Fellers, G.M., and C.A. Drost. 1991. *Xantusia riversiana* Cope, Island Night Lizard, *in* Catalogue of American Amphibians and Reptiles. Society for the Study of Amphibians and Reptiles. Davis, California.

Fellers, G.M.., and C.A. Drost. Undated. The Island Night Lizard - A Unique Channel Islands Endemic. Unpublished report.

Fellers, G.M.., C.A. Drost, W.J. Muntz, and T. Murphey. 1998. Ecology of the Island Night Lizard, *Xantusia riversiana*, on San Nicolas Island, California. U.S. Navy, Point Mugu, and Biological Research Division, U.S. Geological Survey, Point Reyes National Seashore, California.

Flemming, S.P., R.D. Chiasson, P.C. Smith, P.J. Austin-Smith, and R.P. Bancroft. 1988. Piping plover in Nova Scotia related to its reproductive and behavioral responses to human disturbance. Journal of Field Ornithology 59(4):321-330.

Gladwin, D.N., D.A. Asherin, and K.M. Manci. 1987. Effects of Aircraft Noise and Sonic Booms on Fish and Wildlife: Results of a Survey of U.S. Fish and Wildlife Service Endangered Species and Ecological Services Field Offices, Refuges, Hatcheries, and Research Centers. NERC-88/30. National Ecology Research Center, U.S. Fish and Wildlife Service. Fort Collins, Colorado.

Hill, L.A., and L.G. Talent. 1990. Effects of capture, handing, and radio-marking on breeding least terns and snowy plovers. Journal of Field Ornithology 61(3):310-319.

Jacques, D.L., C. Strong, and T. Keeney. 1996. Brown pelican roosting patterns and responses to disturbance at Mugu Lagoon and other non-breeding sites in the Southern California bight. National Biological Survey Technical Report 54.

Keeney, T.W. 1998. Personal communication regarding observations of reactions of the light-footed clapper rail (*Rallus longirostris levipes*) to explosives. Ecologist, Navy Base Ventura County. Point Mugu, California..

Lockheed Environmental System and Technologies, Inc. 1995. Western snowy plover monitoring for the Lockheed launch vehicle 15 August 1995 Launch, Vandenberg Air Force Base, California. Las Vegas, Nevada.

Lockheed Martin Environmental Services. 1999. Monitoring of California brown pelicans, western snowy plovers, and California red-legged frogs for the Athena 2 launch on April 27, 1999. Prepared for Vandenberg Air Force Base, California. Las Vegas, Nevada.

Manci, K.M., D.N. Gladwin, R. Villella, and M.G. Cavendish. 1988. Effects of Aircraft Noise and Sonic Booms on Domestic Animals and Wildlife: A Literature Synthesis. National Ecology Research Center, U.S. Fish and Wildlife Service. Fort Collins, Colorado.

Nur, N., G.W. Page, and L.E. Stenzel. 1999. Population Viability Analysis for Pacific Coast Snowy Plovers. Unpublished data. Point Reyes Bird Observatory, Stinson Beach, California.

Page, G.W., L.E. Stenzel, W.D. Shuford, and C.R. Bruce. 1991. Distribution and abundance of the Snowy Plover on its western North American breeding grounds. Journal of Field Ornithologists 62:245-255.

Page, G.W., and P.E. Persons. 1995. The Snowy Plover at Vandenberg Air Force Base: Population Size, Reproductive Success, and Management. Point Reyes Bird Observatory, Stinson Beach, California.

Palacios, E.P., L. Alfaro, and G.W. Page. 1994. Distribution and abundance of breeding snowy plovers on the Pacific coast of Baja California. Journal of Field Ornithology. 65(4):490-497.

U.S. Fish and Wildlife Service. 1980. Selected Vertebrate Endangered Species of the Seacoast of the United States - Island Night Lizard. FWS/OBS-80/01.36. National Fish and Wildlife Laboratory. Fort Collins, Colorado.

U.S. Fish and Wildlife Service. 1983. The California Brown Pelican Recovery Plan. Portland, Oregon, under contract with California Department of Fish and Game and University of California at Davis.

U.S. Fish and Wildlife Service. 2001. Programmatic Biological Opinion for Ongoing Activities at the Naval Base Ventura County, California (5090 Ser PW420/075) (1-8-99-F-24). Ventura Fish and Wildlife Office. Ventura, California.

Warriner, J.S., J.C. Warriner, G.W. Page, and L.E. Stenzel. 1986. Mating system and reproductive success of a small population of polygamous snowy plovers. Wilson Bulletin 98:12-37.

Wehtje, W., and T. Baron. 1993. Populations size and breeding success of the western snowy plover on San Nicolas Island. Report prepared for the U.S. Fish and Wildlife Service. Western Foundation for Vertebrate Zoology, Camarillo, California.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ventura Fish and Wildlife Office
2493 Portola Road, Suite B
Ventura, California 93003

IN REPLY REFER TO:
81440-2010-F-0039

August 26, 2010

Captain J.J. McHugh
Naval Base Ventura County
311 Main Road, Suite 1
Point Mugu, California 93042-5033

Subject: Biological Opinion for the San Nicolas Island Wind Energy Project, Ventura County, California (8-8-10-F-35)

Dear Captain McHugh:

This document transmits the U.S. Fish and Wildlife Service's (Service) biological opinion based on our review of the subject project on San Nicolas Island and its effects on the federally threatened island night lizard (*Xantusia riversiana*) and western snowy plover (*Charadrius alexandrinus nivosus)*. The U.S. Navy (Navy) proposes to install and maintain wind-powered turbines and an energy storage facility on San Nicolas Island, which is owned by the Navy. The subject project is intended to provide a reliable source of renewable electrical energy and thereby reduce the Navy's dependence on burning fossil fuels to provide energy for operations on San Nicolas Island. Your original request for the Service to consider the project's effects on the island night lizard, dated May 24, 2010, was received in our office on June 1, 2010. Your subsequent request for the Service to consider the project's effects on the western snowy plover was dated July 6, 2010, and was received in our office on July 8, 2010. Your requests and our response are in accordance with section 7 of the Endangered Species Act of 1973, as amended (Act)(16 U.S.C. 1531 et seq.).

This biological opinion was prepared using information provided in your request for formal consultation, electronic and telephone communications between our staffs, and information in our files. A complete decision file for this biological opinion is available at the Ventura Fish and Wildlife Office.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

At the shortest distance to the mainland, San Nicolas Island lies approximately 60 miles southwest of mainland Ventura County, California. San Nicolas Island is owned by the Navy

and operated to support various types of training, as well as to test and evaluate sea, land, and air weapons systems. Currently, the Navy uses a barge to transport fuel to the island where the fuel is burned in electricity generators. The barges are subject to delays caused by hazardous weather, and they present a risk of environmental contamination should a fuel spill occur. The proposed wind-powered turbines are intended to produce renewable energy and reduce the amount of fossil fuel required to provide energy for operations on the island. The proposed project may provide a more reliable energy source and lower the risk of a fuel spill.

The subject project would generally involve construction and maintenance of wind-powered turbines and an energy storage facility on the southeastern section of the island. The turbines (0.057 acre footprint each) would be constructed within a 250-foot wide corridor along Skyline Drive, beginning roughly 0.6 mile southwest of the airstrip, and continuing for 1-mile to the northwest. The energy storage facility (0.11 acre footprint) would be constructed near building 114, which lies southwest of the intersection of Owen Road and Monroe Drive. Figures 1 and 2 of the biological assessment (Navy 2010a) display the locations of the turbine area, the energy storage facility, and the conduit line between the two. The Navy does not expect ground disturbance to occur over the entire action area. Except for driveways and maintenance areas at each turbine and the energy storage facility, the proposed project area would be either actively revegetated or allowed to passively revegetate after disturbance

The project would progress through at least four phases scheduled to begin in Fall 2010 and end in 2013. The Navy designed a fifth phase and may implement it depending on the performance of the wind turbines erected in phases 2 through 4. The Navy has not determined (1) whether the final buildout will include 9, 10, or 11 turbines; (2) the locations for the wind turbines and access driveways within the turbine corridor; and (3) whether or not the existing utility corridor between the turbine corridor and the energy storage facility is adequate. Therefore, we will analyze the proposed project assuming that final buildout will include the largest amount of possible disturbance proposed by the Navy.

As described more specifically in the biological assessment (Navy 2010a), the proposed project activities would include:

Phase 1: scheduled for Fall 2010

This phase would include installing the necessary infrastructure for the first three wind turbines which would be constructed during phase 2. Phase 1 activities would include road improvements and stabilization along Skyline Drive; erosion control intended to improve habitat for the island night lizard (e.g., planting, transplanting, and seed dispersal of native shrubs used by island night lizards); clearing a driveway from each turbine to Skyline Drive; and installing turbine foundations, conduit between the project area and the existing powerhouse, and fences around some of the turbine footprints. The Navy would fence at least one turbine, but may not fence every turbine. The Navy proposes to survey the fenced areas when the turbines are installed and operating to determine the turbines' effects on migratory birds. The fence(s) are intended to prevent island foxes (*Urocyon littoralis dickeyi*) from scavenging bird carcasses before the surveys can occur.

Phase 2: scheduled for 2011
This phase would involve construction of the first three wind turbines. Additional ground disturbance during this phase would include staging areas for construction equipment and turbine hardware.

Phase 3: scheduled for 2012
This phase would involve the installation of infrastructure (as described for Phase 1) for four wind turbines to be installed during phases 4 and 5.

Phase 4: scheduled for 2013
This phase would involve construction of two wind turbines and the energy storage facility. Additional ground disturbance during this phase would include staging areas for construction equipment, building supplies, and turbine hardware.

Phase 5
This phase has not yet been scheduled. It would involve installation of infrastructure for, and construction of, up to two additional wind turbines. The extent to which this phase will be implemented, if at all, will depend on the energy output and efficiency of the turbines installed in phases 1 through 4.

The Navy would begin maintenance of the turbines after Phase 2 and continue for as long as the turbines operate on San Nicolas Island. Maintenance would primarily consist of removing vegetation (hand-removal or herbicide) around the base of the turbines and the energy storage facility. The Navy performs this maintenance around all facilities on the island. This would occur a few times per year and will last for a few days. The Navy may also remove/treat vegetation around the base of turbine fences if the vegetation reduces the effectiveness of the fences in keeping out scavengers. The trucks and workers involved should not incur further disturbance to the proposed project area as they will be using pre-established roads and driveways.

The Navy will implement the following measures to minimize impacts to the island night lizard:

1. Avoid unnecessary disturbance and habitat loss by flagging the limits of construction areas. Equipment and personnel will not operate outside these limits;

2. Employ Best Management Practices (BMP) as listed in Appendix 1 of the biological assessment (Navy 2010a). These BMPs generally include avoiding the introduction of non-native species, pollution and contamination, erosion, unnecessary vegetation removal, and soil compaction;

3. Treatment of non-native plants within the project area once or twice per year during phases 1 through 3. Treatment includes hand pulling and foliar application of herbicide. Target plants are non-native annuals that do not provide island night lizard habitat;

4. Employ a biologist(s), approved by the Service, to ensure impacts to the island night lizard are minimized. The biologist(s) will educate workers about sensitive habitats and how to implement avoidance and minimization measures, monitor the project area and determine island night lizard density, survey the project area prior to work activities, and relocate any island night lizards located in harm's way to the nearest suitable habitat;

5. A biologist will review existing and new structures and recommend the installation of perch deterrents for predatory birds, as appropriate;

6. Stage construction materials in low-density island night lizard habitat and avoid stacking construction materials. The biologist(s) will check any stacked materials for island night lizards prior to crews moving the materials;

7. Develop and implement an emergency response plan to contain and clean up accidental spills;

8. Maintain a trash free site to avoid attracting predators; and

9. Implement erosion control by dispersing run-off and reducing incising down slope. Erosion control measures may include plantings and/or seed dispersal of shrubs used by island night lizards.

ANALYTICAL FRAMEWORK FOR THE JEOPARDY DETERMINATION

The jeopardy analysis in this biological opinion relies on four components: (1) the *Status of the Species*, which evaluates the range-wide condition of the island night lizard and the western snowy plover, the factors responsible for that condition, and the species' survival and recovery needs; (2) the *Environmental Baseline*, which evaluates the condition of the island night lizard and the western snowy plover in the action area, the factors responsible for that condition, and the relationship of the action area to the survival and recovery of the island night lizard and the western snowy plover; (3) the *Effects of the Action*, which determines the direct and indirect impacts of the proposed Federal action and the effects of any interrelated or interdependent activities on the island night lizard and the western snowy plover; and (4) the *Cumulative Effects*, which evaluates the effects of future, non-Federal activities in the action area on the island night lizard and the western snowy plover.

In accordance with policy and regulation, the jeopardy determination is made by evaluating the effects of the proposed Federal action in the context of the current status of the island night lizard and the western snowy plover, taking into account any cumulative effects, to determine if implementation of the proposed action is likely to cause an appreciable reduction in the likelihood of both the survival and recovery of the island night lizard and the western snowy plover.

The jeopardy analysis in this biological opinion places an emphasis on consideration of the range-wide survival and recovery needs of the island night lizard and the western snowy plover and the role of the action area in the survival and recovery of the island night lizard and the western snowy plover as the context for evaluating the significance of the effects of the proposed Federal action, taken together with cumulative effects, for purposes of making the jeopardy determination.

STATUS OF THE SPECIES

Island night lizard

The island night lizard was listed as threatened on August 11, 1977 (42 Federal Register (FR) 40682). The Service has not designated critical habitat for this species, and thus we do not address project effects to island night lizard critical habitat in this biological opinion. The following information for the island night lizard was taken from Service (1980), Fellers and Drost (undated.), Fellers and Drost (1991a, b), Fellers et al. (1998), and Mautz (2001).

The island night lizard is endemic to three of the Channel Islands off the coast of southern California. It occurs on San Clemente, San Nicolas, and Santa Barbara Islands, and one small islet (Sutil Island) adjacent to Santa Barbara Island. The majority of island night lizards occur on San Clemente Island (estimates range from 2 to 20 million individuals) due to the large size of the island and availability of high-quality habitat. The population estimate for Santa Barbara Island (approximately 17,000), exceeds that of the much larger San Nicolas Island (approximately 15,000), because San Nicolas Island supports a relatively small amount of high-quality island night lizard habitat.

The island night lizard is a medium-sized lizard (2.75 to 4 inches snout-vent length) with soft scales and folds of skin along the neck and sides of the body. The back is mottled with pale gray or beige and yellow-brown, darkened to varying degrees with black giving it a reticulated or netted pattern. Occasionally, individuals may have dark dorsolateral lines or a vertebral stripe. Some island night lizards have a bluish tinge on the belly changing to yellow on the underside of the tail. Color variations appear to differ between the islands but individuals tend to match the substrates they inhabit. Compared to other Channel Island endemic vertebrates, island night lizards are apparently the most morphologically distinct from their closest relatives on the mainland, indicating a longer period of isolation (Fellers et al. 1998).

Despite their name, island night lizards are not nocturnal. They are most active at midday with little activity in the cool mornings or evenings and little, if any, activity at night. Activity peaks seasonally as well; island night lizards become active in spring during the mating season and activity subsides through the summer and fall. Young of the year may be active throughout the year, while adults display seasonal and daily variations in activity described.

Island night lizards become sexually mature in their third or fourth year. Unlike most reptiles, the island night lizard is viviparous, meaning that it bears live young that are nourished within

the female. The females give birth to 3 to 9 young in September of each year following a 14-week gestation period. Only half of the females give birth in a given year and even then only one brood is attempted. The species is slow-maturing, long-lived, with a low reproductive potential. Fellers et al. (1998) estimate that some island night lizards may be more than 30 years old.

Like other lizard species, island night lizards are able to "self-amputate" their tails. This capability, known as autotomy, is thought to be a defensive mechanism to distract potential predators. Island night lizards can also lose their tails during intraspecific aggression. Island night lizards are able to grow a new tail, although this requires energy resources that could otherwise be used for growth, reproduction, etc. Unlike smaller lizard species, island night lizards regenerate tails very slowly. The island night lizard's tail regeneration rate is an order of magnitude slower than smaller lizards, and a tail can take up to four years to completely regenerate (Fellers and Drost 1991b).

Island night lizards occupy a variety of habitats. Generally, they are most abundant in boxthorn (*Lysium californicum*) and cactus (*Opuntia* spp.) scrub; however, on San Nicolas Island the species also occurs in high density in the cobbles and driftwood of Red Eye Beach. Island night lizards reach moderate density in giant Coreopsis (*Coreopsis gigantea*) stands and rocky areas with fissures, and low density in grassland and mixed shrub habitat. The species will also opportunistically inhabit debris piles and other cover left by humans which may simulate the protective structure of natural habitat.

In suitable habitat, home ranges overlap and island night lizards can reach greater densities than any other ground-dwelling lizard; up to 1,300 lizards per acre in boxthorn and 1,000 per acre in cactus scrub (Fellers and Drost 1991). These high densities are attributed to a low metabolic rate and associated lower energy demands, sedentary nature, and their ability to live on diverse foods. Island night lizards eat a wide variety of insects and spiders and they ingest a relatively large quantity of plant material for a lizard of their size.

The island night lizard is threatened by past and ongoing effects of modern human occupation of the Channel Islands. Many years of grazing and browsing pressure from non-native mammals caused loss of habitat, long-term alteration of habitat, and subsequent accelerated erosion. Impacts from modern human occupation of the Channel Island also include the introduction of non-native predators of the island night lizard including feral cats (*Felis catus*) and black rats (*Rattus rattus*). Other factors that threaten the island night lizard to a lesser degree include loss of habitat to development; introduction of non-native plants that displace native habitats, direct mortality from vehicles, and trampling and capture by humans. These threats may be exacerbated by the ability of the species to congregate in high density. Any disturbance, particularly in high-quality habitat, has the potential to affect a large number of island night lizard individuals.

The largest threat to the island night lizard on San Nicolas Island is the paucity of high-quality habitat remaining after extensive conversion of the island to low-quality habitat caused by non-

native mammals. Non-native predators are not a threat to the species on San Nicolas Island, as there are no records of black rats on the island, and the Navy is nearing completion of efforts to remove all feral cats from that island (Ruane pers comm 2010). The recent introduction of southern alligator lizards (*Elgaria multicarinata*) to San Nicolas Island may affect the island night lizard through interspecific competition; however, the nature of the interactions between these species is largely unknown.

The island night lizard is affected by ongoing activities on San Nicolas Island. These activities, and the associated effects on the species, are addressed by the October 15, 2001, programmatic biological opinion for ongoing activities on San Nicolas Island (1-8-01-F-14). The three most recent end-of-year reports (Navy 2007, 2008, 2009) pursuant to this biological opinion indicate that capture and relocation occurs fairly often (46 times in three years), although injury or death is very rare (one in three years).

Western snowy plover

The Pacific Coast population of the western snowy plover was federally listed as threatened on March 5, 1993 (58 FR 12864), and critical habitat was designated on September 29, 2005 (70 FR 56970). The proposed project site is not within designated critical habitat for the western snowy plover, and thus we do not address project effects to western snowy plover critical habitat in this biological opinion. We issued a recovery plan for the western snowy plover in September 2007 (Service 2007).

The western snowy plover, a small shorebird in the family Charadriidae, weighs from 1.2 to 2 ounces and ranges in length from 5.9 to 6.6 inches (Page et al. 1995). It is pale gray-brown above and white below, with a white hindneck collar and dark lateral breast patches, forehead bar, and eye patches. The bill and legs are blackish. In breeding plumage, males usually have black markings on the head and breast; in females, usually one or more of these markings are dark brown. Early in the breeding season, a rufous crown may be evident on breeding males, but it is not typically seen on females. In non-breeding plumage, sexes cannot be distinguished because the breeding markings disappear. Fledged juveniles have buffy edges on their upper parts and can be distinguished from adults until approximately July through October, depending on when in the nesting season they hatched. After this period, molt and feather wear makes fledged juveniles indistinguishable from adults. Individual birds 1 year or older are considered to be breeding adults. The mean annual life span of western snowy plovers is estimated at about 3 years, but at least one individual was at least 15 years old when last seen (Page et al. 1995).

Western snowy plovers are primarily visual foragers, using the run-stop-peck method of feeding typical of *Charadrius* species. They forage on invertebrates in the wet sand and amongst surf-cast kelp within the intertidal zone, in dry sand areas above the high tide, on salt pans, on spoil sites, and along the edges of salt marshes, salt ponds, and lagoons. Western snowy plovers sometimes probe for prey in the sand and pick insects from low-growing plants. Their food sources consist of immature and adult forms of aquatic and terrestrial invertebrates. Little quantitative information is available on food habits.

The Pacific Coast population of western snowy plovers nests near tidal waters along the mainland coast and offshore islands from Damon Point, Washington, to Bahía Magdelena, Baja California, Mexico. Most nesting occurs on unvegetated to moderately vegetated, dune-backed beaches and sand spits. Other less common nesting habitats include salt pans, dredge spoils, and salt pond levees. Nests consist of a shallow scrape or depression, sometimes lined with beach debris (e.g., small pebbles, shell fragments, plant debris, and mud chips); nest lining increases as incubation progresses. Nests are usually located within 328 feet of water, but can be farther away when there is no formative vegetative barrier between the nest and water (Page and Stenzel 1981). The majority of western snowy plovers are site-faithful (returning to the same breeding area in subsequent breeding seasons); some also disperse within and between years (Warriner et al. 1986, Stenzel et al. 1994).

The nesting season of the western snowy plover extends from early March through late September. Generally, the breeding season may be 2 to 4 weeks earlier in southern California than in Oregon and Washington. The earliest nests on the California coast occur during the first week of March in some years and by the third week of March in most years (Page et al. 1995). Peak initiation of nesting is from mid-April to mid-June (Warriner et al. 1986; Powell et al. 1997). On the Oregon coast, nesting may begin as early as mid-March, but most nests are initiated from mid-April through mid-July (Wilson-Jacobs and Meslow 1984). Peak nest initiation occurs from mid-May to early July (Stern et al. 1990). On the Washington coast, most adults arrive during late April, with maximum numbers present from mid-May to late June.

The typical clutch size of western snowy plovers is three with a range from two to six (Warriner et al. 1986, Page et al. 1995). Both sexes incubate the eggs, which take about 27 days to hatch, with the female tending to incubate during the day and the male at night (Warriner et al. 1986). After losing a clutch or brood or successfully hatching a nest, western snowy plovers may re-nest at the same site or move up to several hundred kilometers (1 kilometer equals 0.62 mile) to nest at other sites (Stenzel et al. 1994, Powell et al. 1997). Re-nesting occurs 2 to 14 days after failure of a clutch, and up to five re-nesting attempts have been observed for a pair (Warriner et al. 1986).

Western snowy plover chicks are precocial (capable of a high degree of independence from hatching), feeding on their own within hours of hatching. However, they are unable to fly until 1 month after hatching. Females generally desert males and broods by the sixth day, and thereafter the chicks are typically accompanied by only males. Females obtain new mates and initiate new nests while males rear the broods (Page et al. 1995).

During the non-breeding season western snowy plovers may remain at breeding sites or may migrate to other locations. In western North America, the western snowy plover winters mainly in coastal areas from southern Washington to Central America (Page et al. 1995); however, the majority of birds winter south of Bodega Bay, California (Page et al. 1986). Many birds from the interior population winter on the central and southern coast of California. In winter, western snowy plovers are found on many of the beaches used for nesting, as well as some beaches where they do not nest. They also occur in man-made salt ponds and on estuarine sand and mud

flats. In California, the majority of wintering western snowy plovers assemble on sand spits and dune-backed beaches. Some also occur on urban and bluff-backed beaches, which are rarely used for nesting (Page et al. 1986). Both coastal and inland-breeding western snowy plovers are very site-faithful to wintering sites.

Historical records indicate that nesting western snowy plovers were once more widely distributed and abundant in coastal Washington, Oregon, and California. Prior to 1970, western snowy plovers bred at 53 coastal locations in California. Between 1970 and 1981, western snowy plovers stopped breeding in parts of San Diego, Ventura, and Santa Barbara counties, most of Orange County, and all of Los Angeles County (Page and Stenzel 1981). In 2007, there were two nesting attempts documented on Los Angeles County beaches (SWCA 2007).

On the Washington coast, western snowy plover populations appear to have increased overall since the early 1990s, although consistent, intensive surveys have been conducted only since the mid-1990s (Service 2007). In Oregon, western snowy plovers historically nested at more than 20 sites on the coast, but only seven core nesting sites are consistently used (Lauten et al. 2006a, 2006b). Populations reached a low from 1991 to 1993 but have generally increased from 1994 to 2006 due to the implementation of management actions for the benefit of western snowy plovers and California least terns, including predator management and protection and restoration of suitable habitat (Service 2007).

The current Pacific Coast population of the western snowy plover is sparse in Washington, Oregon, and northern California. In 2006, estimated populations were 70 adults along the Washington coast (Pearson et al. 2006), 177 to 179 adults along coastal Oregon (Lauten et al. 2006b), and 2,231 adults in coastal California and San Francisco Bay (window survey including correction factor) (Page 2006, Service 2006). The California population of western snowy plovers comprises at least 90 percent of the listed Pacific Coast population. Eight geographic areas support over three-quarters of the California coastal breeding population: San Francisco Bay, Monterey Bay, Morro Bay, the Callendar-Mussel Rock Dunes area, the Point Sal to Point Conception area (VAFB), the Oxnard lowland, Santa Rosa Island, and San Nicolas Island (Page et al. 1991). A recent population estimate suggests the Baja California, Mexico population is approximately 1,000 breeding adults (E. Palacios, Pers. Comm. 2008).

Western snowy plover habitat is subject to erosion and accretion and is highly susceptible to degradation by mechanized beach cleaning; construction of seawalls, breakwaters, jetties, piers, homes, hotels, parking lots, access roads, trails, bike paths, day-use parks, marinas, ferry terminals, recreational facilities; and associated support services that may cause direct and indirect losses of breeding and wintering habitat for the western snowy plover. Urban development has permanently eliminated valuable nesting habitat on beaches in southern Washington (Brittell et al. 1976), Oregon (Oregon Department of Fish and Wildlife 1994), and California (Page and Stenzel 1981). Increased development increases human use of the beach, thereby increasing disturbance to nesting plovers. Human activities such as walking, jogging, fishing, fireworks, unleashed pets, horseback riding, and off-road vehicles can destroy the western snowy plover's cryptic nests and chicks.

In addition to causing direct loss of habitat, urban development can result in additional adverse impacts to western snowy plovers. Human activities can interfere with foraging activities by disrupting the ability of adults and chicks to get to the wet beach to feed and return to the dunes or their nest (Burger and Fry 1993). Chicks can also become separated from their parents as a result of human disturbance of broods. Such disturbance could cause or contribute to chick mortality by interfering with essential chick-rearing behaviors or by causing intolerable stresses directly to the chicks (Cairns and McLaren 1980). For example, separation of chicks and their parent can lead to lethal exposure to wind and cold temperatures or disturbance that interferes with foraging could result in the starvation of western snowy plover chicks. In some instances, disturbance associated with these types of recreational activities is expected to temporarily flush western snowy plovers and not affect the birds in such a substantial manner. In other cases, such disturbance could interfere with the metabolism and thermoregulation of western snowy plover chicks and migrating or wintering adults such that they starve or egg production is impaired during the subsequent nesting season (Cairns 1982). The available information regarding the energetics of western snowy plovers is inadequate to assess the likelihood that such injury or mortality would result.

West Nile virus, a mosquito-borne disease which can infect birds, reptiles, and mammals, has spread rapidly across the United States from the initial introduction in New England (National Audubon Society 2006). In 2004 to 2006 the disease was reported from two coastal counties (Lane and Lincoln) in Oregon but has not been reported from any coastal counties in Washington (U.S. Geological Survey 2006). The virus has been identified in dead piping plovers and killdeer (*Charadrius vociferus*), both of which are closely related to the western snowy plover (Center for Disease Control 2004).

Predator density is an important factor affecting the quality of western snowy plover nesting habitat (Stenzel et al. 1994). The presence of humans near western snowy plover nesting areas can increase the presence of predators due to improper disposal of trash. Predation can result in the loss of adults, chicks, or eggs. Predators can also separate chicks from adults, which can lead to chick mortality. Predation by both native and non-native species limits western snowy plover reproductive success at many Pacific Coast sites. Non-native predators include eastern red foxes (*Vulpes vulpes regalis*), domestic and feral cats (*Felis catus*) and dogs (*Canis lupus familiaris*), and Virginia opossums (*Didelphis virginiana*). Coyotes (*Canis latrans*), American crows (*Corvus brachyrhynchos*), common ravens (*Corvus corax*), American kestrels (*Falco sparverius*), loggerhead shrikes (*Lanius ludovicianus*), and several gull species (*Larus* spp.) are native predators of the western snowy plover. The threat of predation by domestic cats intensifies when housing is constructed near western snowy plover breeding habitat. In addition, unnatural habitat features such as landscaped vegetation (e.g., palm trees), telephone poles, transmission towers, fences, buildings, and landfills near western snowy plover nesting areas attract predators (Service 2007).

One of the most dramatic causes of habitat loss for coastal breeding western snowy plovers has been the encroachment of non-native plant species that tend to stabilize dunes and grow too densely to accommodate nesting western snowy plovers. These include European beachgrass

(*Ammophila arenaria*), American beachgrass (*Ammophila breviligulata*), Scotch broom (*Cytisus scoparius*), gorse (*Ulex europaeus*), South African iceplant (*Carpobrotus edulis*), pampas grass (*Cortaderia selloana*), jubata grass (*Cortaderia jubata*), iceplant (*Mesembryanthemum* sp.), and other non-native weed species (Service 2007). These species may also reduce the diversity and abundance of western snowy plover food sources (Slobodchikoff and Doyen 1977), and provide habitat for western snowy plover predators that historically would have been largely precluded by the lack of cover in the dune community (Stern et al. 1991). Shore pine (*Pinus contorta*) is a native plant species that has invaded coastal dunes and resulted in similar impacts to western snowy plovers (Schwendiman 1975, California Native Plant Society 1996, Powell 1996).

The Pacific Coast population of western snowy plovers has experienced widespread loss of nesting habitat and reduced reproductive success at many nesting locations. The reasons for the decline and degree of threats vary by geographic location; however, the primary threat is habitat destruction and degradation. Habitat loss and degradation can be primarily attributed to human disturbance, urban development, introduced plants, and expanding predator populations. Natural factors, such as inclement weather, have also affected the quality and quantity of western snowy plover habitat (Service 1993).

The primary objective of the recovery plan is to remove the Pacific coast population of the western snowy plover from the list of endangered and threatened wildlife and plants by: (1) increasing population numbers distributed across the range of the Pacific coast population of the western snowy plover; (2) conducting intensive ongoing management for the species and its habitat and developing mechanisms to ensure management in perpetuity; and (3) monitoring western snowy plover populations and threats to determine success of recovery actions and refine management actions.

San Nicolas Island typically supports between 80 and 250 wintering western snowy plovers and between 40 and 100 breeding plovers (Volume 2, Table B-1 in Service 2007). Winter 2009/2010 surveys found 99 plovers (Service 2010), and breeding season surveys in 2010 found 50 plovers (Ruane, U.S. Navy, pers. comm. 2010). The major threats to mainland coastal western snowy plovers (i.e., non-native plants and predators, human activities) do not impact the species with nearly the same intensity on San Nicolas Island; island foxes, gulls, American kestrels, and feral cats are typical predators. A recently emerging threat to the western snowy plover on San Nicolas Island is increasing pinniped populations which can overwhelm plover breeding beaches and force western snowy plovers to nest further from the beach in less typical habitat (Ruane, U.S. Navy, pers. comm. 2010).

ENVIRONMENTAL BASELINE

The implementing regulations for section 7(a)(2) of the Act define the "action area" as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 Code of Federal Regulations (CFR) 402.02). For the purposes of this biological opinion and based on information provided by the Navy, we consider the action area to be an approximately 40-acre area comprising:

1. A 1-mile long by 250-foot wide area (roughly 30 acres) along and including Skyline Drive. This area is designated as the turbine corridor;

2. Approximately 1.6 miles of Harrington and Owen Roads between the turbine corridor and the energy storage facility. This roughly 10-acre segment is 50 feet wide including a 20 foot buffer on both sides of the roads. The buffer areas, which are not paved and are subject to additional disturbance, cover roughly 7.8 acres; and

3. The 0.11-acre footprint of the energy storage facility.

The action area, as defined above, is larger than the actual footprint that would be developed. However, because the Navy has not determined the final number and locations of turbines, and has not determined whether a new utility corridor will need to be installed, impacts could occur anywhere within the 40 acres.

Island night lizard

The action area contains a small fraction of the island night lizard habitat available across the species range. The entire action area lies in low quality island night lizard habitat, and no lizards were found during a November 2009 habitat assessment (Drost *in litt* 2009). Vegetation cover in the action area ranges from 0 to 20 percent and consists of grasses (e.g., *Bromus* spp.), Australian saltbush (*Atriplex semibaccata*), coyote brush (*Baccharis pilularis*), with scattered occurrences of southern island morning glory (*Calystegia macrostegia*) and Trask's locoweed (*Astragalus taskiae*). Portions of the action area are gravel and bare rock; however, most of these areas lack the cracks, crevices, and boulders that provide cover for island night lizards at other locations on San Nicolas Island. Drost (*in litt* 2009) identified a 1.98 acre area that contained small boulders and scattered surface slabs of sandstone within the turbine corridor that could function as island night lizard habitat. Drost (*in litt* 2009) hypothesizes this area may be used during dispersal as a corridor or refugia in otherwise low quality habitat. Figure 3 of the biological assessment illustrates the botanical communities in and around the action area, and figure 2 illustrates the location of the 1.98 acres of potentially suitable habitat.

Although no island night lizards were located in the action area during surveys in November 2009 (Drost *in litt* 2009), the habitat present can support island nights lizards at very low numbers (Fellars et al. 1998, R. Loomis, Navy, *in litt.*, 2010), and island night lizards were detected during the same survey at the northern edge of the action area near the eastern end of Skyline Drive (see Figure 2 of the biological assessment (Navy 2010a)). Therefore, it is reasonable to assume that island night lizards occur in the action area, albeit at very low density. The action area is severely degraded—loss of vegetative cover and top soil, increase in non-native plant cover, accelerated erosion—due to historical ranching operations prior to Navy ownership of San Nicolas Island. Although we do not know to what extent high-quality island night lizard habitat occurred in the action area prior to ranching, these effects have certainly reduced the ability of the species to meaningfully inhabit the action area. Island night lizards in the action area may be subject to occasional predation by non-native cats and direct impacts from

vehicle and human traffic; however, there are very few feral cats remaining on San Nicolas Island (Ruane pers comm 2010), and the action area receives little vehicle and human traffic (Navy 2010a).

Western snowy plover

The western snowy plover does occur on San Nicolas Island in both breeding and non-breeding seasons (typically 80 to 250 wintering plovers and 40 to 100 breeding plovers), although the action area does not contain suitable breeding or foraging habitat. Plover habitat occurs in segments around the island, with the longest continuous stretches of plover habitat occurring on the southeastern side of the island, downslope from the turbine corridor. The shortest distance between plover habitat and the turbine corridor is approximately 0.75 mile inland with a roughly 700-foot difference in elevation.

The species has not been observed flying through the action area (Navy 2010b); however, the species is known to make overland flights during migration (Page et al. 1986, Service 2007). Therefore, it is reasonable to assume that western snowy plovers do, on occasion, fly through the action area when moving around the island or when migrating.

The October 15, 2001, programmatic biological opinion for ongoing activities on San Nicolas Island (1-8-01-F-14) addressed impacts from Navy activities on the western snowy plover. The three most recent end-of-year reports (Navy 2007, 2008, 2009) pursuant to this biological opinion indicate that the ongoing activities appear to have relatively minor effects on the western snowy plover. The Navy reported that a total of (1) one nesting plover may have been temporarily affected by missile/rocket launch activities, with no long term effect on nest success, and (2) one nest may have been abandoned as a result of launch activities, although the definite cause of abandonment could not be determined.

EFFECTS OF THE ACTION

Island night lizard

The Navy estimates that island night lizards occupy the action area in very low numbers (Loomis *in litt.* 2010). Because of the undetermined placement of the turbines, any island night lizards occupying the action area have the potential to be affected by project activities. The Navy expects the total ground disturbance in the action area, including structure footprints (0.74 acre), staging areas (5.5 acres), and the utility corridor (7.8 acres) to occur in 35 percent (14 acres) of the action area. Thus, not all island night lizards in the turbine corridor would be directly impacted by the proposed activities. All island night lizards in the development areas would be subject to capture and relocation.

The Navy proposes to survey the action area for island night lizards prior to ground disturbance and relocate all observed island night lizards out of harm's way. Any island night lizards that avoid detection and remain in the action area may be crushed, buried, or otherwise injured by

construction equipment, moving vehicles, or worker foot traffic. Capture and relocation is intended to reduce the likelihood of injury or mortality but could cause physiological stress when an individual is relocated to unfamiliar territory. In addition, an individual must expend extra energy resources to regrow a tail shed as a defensive mechanism during capture.

The proposed activities would temporarily increase vehicle and foot traffic in the action area. Other vehicle and foot traffic may increase in the action area as a consequence of the improved driving condition of Skyline Drive. Island night lizards on roads and trails may be crushed or otherwise injured by moving vehicles or foot traffic. They may also be illegally captured as pets for personal collections.

All island night lizards in the action area would be subject to indirect effects through increased noise and vibration. We do not know the extent to which noise and vibration affect island night lizards. At a minimum, we expect lizards to seek shelter and reduce foraging in the presence of significant ground vibrations. Given the species' slow metabolism, a short-term interruption of foraging will not significantly affect an individual's health; however, if this behavior lasts long enough, it could decrease an individual's health and/or breeding success. Any effects from noise and vibration would be most acute when heavy construction equipment is in the action area for extended periods while preparing access driveways, clearing footprints for turbines and the energy storage facility, installing the utility conduit (if necessary), and installing turbines and the energy storage facility.

The entire action area lies in low-density island night lizard habitat and much of it is unsuitable to support the species. The Navy identified 1.98 acres of potential island night lizard habitat in the action area, and this is subject to loss as a result of the proposed project. Loss of this habitat would remove a potential refuge for island night lizards dispersing from higher quality habitat. The resulting longer distances between refugia may expose island night lizards to greater predation rates, inclement weather, and increased energy expenditure. The Navy's proposal to conduct erosion control using native plants preferred by the island night lizard may offset this habitat loss. If the native plants are successful, the resulting higher quality habitat in the action area would decrease the distance between patches of high quality island night lizard habitat to the east and west of the action area (see Figure 2 of Navy 2010a).

The Navy will implement the proposed activities in phases over four to five years. Compared to all of the impacts occurring in a single year, this phased schedule may lower the intensity of the impact of the entire project to the island night lizard by allowing the species and its habitat some recovery time between impacts incurred during each phase. The phasing will also allow the Navy to implement the proposed erosion control and revegetation measures to improve habitat for the island night lizard before more disturbance takes place.

Over the course of the entire project, less than 1 acre of poor quality island night lizard habitat will be permanently lost to the species, although the Navy's proposal to conduct erosion control and revegetation could stabilize existing habitat and create new higher-quality habitat for the species. Moving vehicles, foot traffic, and habitat loss could cause stress, injury, or death to

island night lizards in the action area. The Navy's proposal to capture and relocate island night lizards from project areas should reduce the chances of injury or death. Based on the poor quality of the habitat, we expect that island night lizards inhabit the action area at very low density. The loss of 1 individual may have a greater effect on a closed population of island night lizards in the action area than it would on an open population or a population occurring at high density; however, the potential adverse effects of the project are unlikely to have a meaningful impact across the species range or on the island-wide population of island night lizards.

Western snowy plover

The action area does not contain suitable breeding or foraging habitat for the western snowy plover, and we do not expect any plovers to land in the action area; however, western snowy plovers do occur in suitable habitat along the coast of San Nicolas Island. Western snowy plovers are most likely to be making long distance movements during the fall and early spring months, and less often will travel long distance to initiate a new nest during the breeding season. We generally expect plovers to follow the coastline when moving around San Nicolas Island. Individuals may also make over-island flights, although we expect this to occur extremely infrequently. The proposed project would create permanent and potentially lethal obstacles for western snowy plovers flying through the action area. Plovers that fly through the action area may be injured or killed if they strike a turbine support tower or if they are struck by a turbine blade. Given their site fidelity and ability to fledge multiple nests per breeding season, the loss of an individual western snowy plover may have locally important consequences for a breeding beach. However, the potential adverse effects of the proposed project should not impair the ability of the western snowy plover to survive and recover across the species' geographic range.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, tribal, local, or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act. Because San Nicolas Island is a federal installation, we are not aware of any non-federal actions that are reasonably certain to occur in the action area.

CONCLUSION

After reviewing the current status of the island night lizard and the western snowy plover, the environmental baseline, the effects of the action, and the cumulative effects, it is the Service's biological opinion that the San Nicolas Island wind energy project would not jeopardize the continued existence of the island night lizard or the western snowy plover. We have reached this conclusion because:

1. The action area lies in low-quality island night lizard habitat, and we expect few, if any, island night lizards to be injured or killed as a result of project activities;

2. The proposed activities will permanently remove a small fraction of low-quality island night habitat on San Nicolas Island and across the species range;

3. The Navy will conduct erosion control by planting native plants which may improve habitat conditions for the island night lizard in the action area;

4. The proposed activities will be spread out over four to five years. Compared to all of the impacts occurring in a single year, this schedule reduces the scale of impacts to the island night lizard in a single year and may allow the island night lizard population in the action area some recovery time before the next impacts;

5. The Navy will work with a qualified biologist, and implement BMPs and measures to minimize impacts to the island night lizard; and

6. Because the action area does not contain habitat for the western snowy plover and we expect over-island flights by the species to occur extremely infrequently, few, if any, western snowy plovers are likely to be killed or injured by the action.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with this incidental take statement. To monitor the impact of incidental take, the Navy must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement (50 CFR 402.14(i)(3)).

We cannot determine the precise number of island night lizards that may be taken as a result of the proposed activities. Because of their small body size and tendency to occur in habitat that is difficult to survey (e.g., crevices, under boulders), incidental take of island night lizards may be difficult to detect. Due to the staggered schedule of the proposed project, we anticipate that the impact of the taking on the island night lizard will be less than if the entire project were to occur in a single year.

We anticipate that any island night lizards detected during pre-construction surveys in the action area could be subject to take in the form of capture during relocation efforts. We do not expect injury or mortality to occur as a result of capture and relocation of island night lizards because the Navy has proposed to use only qualified individuals in these efforts. As a result of capture, a subset of captured lizards may experience a substantial disruption of normal behavioral patterns to the point of harassment; however, capture and relocation is intended to reduce the potential for injury or mortality that would more likely result from implementing the project without relocating individuals out of harm's way.

Any island night lizards that evade detection, capture, and relocation, and remain in the action area may be crushed by construction equipment, vehicles, or foot traffic, or may be otherwise wounded or killed during the proposed activities. Due to the generally poor quality habitat, and low density of island night lizards in the action area, we anticipate that no more than 3 island night lizards would be wounded or killed annually as a result of project activities.

We anticipate that few, if any, island night lizards will experience habitat modification or resource loss to the point that it would result in death or injury as a result of the proposed project. Approximately 0.75 acre of the action area will be permanently impacted by the access driveways and footprints of the turbines and the energy storage facility; however, the action area lies within low-quality, largely degraded habitat for island night lizards, and no island night lizards were identified in the action area during surveys in November 2009.

We expect the regular maintenance activities to have a lower impact on the island night lizard than ground disturbing activities. The monitoring and maintenance will occur with less frequency (once or twice per year for a period of a few days), and the trucks and workers involved should not incur further disturbance to the action area as they will be using pre-established roads on which island night lizards should be easier to see and avoid. However, vehicles and worker foot traffic may crush or otherwise wound island night lizards basking on roads or trails, or taking cover elsewhere.

Western snowy plovers that fly through the action area and collide with a turbine support tower or fly through the turbine blade airspace are likely to be wounded or killed. Although the Navy proposes to survey the portion of the action area under the wind turbines to assess the level of mortality to western snowy plovers and other migratory birds caused by the turbines, the Navy would underestimate the level of take if scavengers remove a plover carcass before a survey takes place. The Navy proposes to fence some turbine areas to prevent scavenging before a plover can be detected.

The number of plovers on San Nicolas Island varies seasonally and annually, and we do not expect the species to occur in the action area with any regularity. We expect plovers to follow the coastline when moving around San Nicolas Island, although we assume that individual plovers make infrequent over-island flights. In addition, the action area covers a small fraction of the land area of San Nicolas Island, further reducing the probability that plovers would fly through the turbine corridor. Therefore, we do not expect western snowy plovers to occur in the

action area, except on very rare occasions. We anticipate that 1 western snowy plover would be wounded or killed annually by impact with turbine support towers, turbine blades, or fences surrounding the turbines.

In the accompanying biological opinion, the Service determined that this level of anticipated take is not likely to result in jeopardy to the island night lizard or the western snowy plover. This incidental take statement does not exempt any activity from the prohibitions against take contained in section 9 of the Act that is not incidental to the action as described in this biological opinion. Island night lizards and western snowy plovers may be taken only within the defined boundaries of the action area as described in the Environmental Baseline section of this biological opinion.

REASONABLE AND PRUDENT MEASURES

We believe the following reasonable and prudent measures are necessary and appropriate to minimize take of the island night lizard and the western snowy plover:

1. The Navy must ensure that the level of incidental take that occurs during project implementation is commensurate with the analysis contained in this biological opinion.

2. Take of island night lizards during project activities must be reduced through well-defined operational procedures.

TERMS AND CONDITIONS

To be exempt from the prohibitions of section 9 of the Act, the Navy must comply with the following terms and conditions, which implement the reasonable and prudent measures described above. These terms and conditions are non-discretionary.

1. The following terms and conditions implement reasonable and prudent measure 1:

    a) During any 12-month period, if 3 island night lizards are found wounded or killed in the action area as a result of project activities, the Navy must contact our office immediately so we can review the action to determine if additional protective measures are needed. The cause of death or injury must be determined by a Service-approved biologist. Project activities likely to result in additional take should cease during this review period. If more than 3 island night lizards are found dead or injured, the Navy must reinitiate consultation and should cease any actions causing such take until the consultation is completed.

    b) To track incidental take of the western snowy plover and observe possible overflights of the action area, the Navy must conduct surveys for the species in the turbine corridor when plovers are mostly likely to fly through the action area.

The schedule for these surveys will be based on the Navy's experience on the San Nicolas Island and must be coordinated with the Service.

c) When 1 western snowy plover is found wounded or killed in the action area as a result of project activities, including long term operation of the turbines, the Navy must contact our office immediately so we can review the action to determine if additional protective measures are needed. If more than 1 western snowy plover is wounded or killed in a 12-month period as a result of project activities, project activities likely to result in additional take should cease and the Navy should reinitiate consultation.

2. The following terms and conditions implement reasonable and prudent measure 2:

a) No more than 15 days before the onset of ground disturbance, one or more Service-approved biologist(s) must survey the project area for island night lizards. The biologist(s) must be on site daily until ground disturbance is complete. As proposed by the Navy, the Service-approved biologist(s) will relocate all island night lizards located in harm's way. If ongoing maintenance of the turbines and energy storage facility will remove/treat plants that serve as island night lizard habitat, the biologist(s) must survey the maintenance area prior to maintenance activities beginning.

b) We hereby authorize Grace Smith to independently monitor, capture, and relocate island night lizards. Ms. Smith has demonstrable experience with these activities and has previously been approved by the Service for similar work. This authorization is valid only for the subject project as described in biological opinion (8-8-10-F-35).

c) One or more Service-approved biologist must conduct a training session for all project personnel prior to the onset of any ground-disturbing activities within the action area. At a minimum, this training must include a description of the island night lizard and its habitat, the general provisions of the Act, the necessity for adhering to the provisions of the Act, the penalties associated with violating the provisions of the Act, and the specific measures that are incorporated into the description of the proposed action to avoid and (or) minimize the adverse effects to this species.

REPORTING REQUIREMENTS

The Navy must provide an annual report to the Service by March 31 following each year in which activities covered by this biological opinion occurred, until final buildout is complete. Subsequent reports are only necessary after incidental take occurs. The reports must document the number of island night lizards and western snowy plovers that were found and the number that were taken during the course of the project; a summary of the effectiveness of the terms and

conditions of this biological opinion; a brief discussion of any problems encountered in implementing minimization measures; and any suggestions of how these measures could be changed to improve conservation of this species while facilitating compliance with the Act. This document will assist the Service in evaluating appropriate measures for conservation of these species during future projects.

DISPOSITION OF DEAD OR INJURED SPECIMENS

Upon locating a dead or injured island night lizard or western snowy plover, initial notification must be made by telephone (805-644-1766) within 3 working days of the finding and in writing to the Ventura Fish and Wildlife Office (2493 Portola Road, Suite B, Ventura, California 93003). The report must include the date, time, and location of the carcass, a photograph, cause of death, if known, and any other pertinent information.

Care must be taken in handling injured specimens to ensure effective treatment and care and in handling dead specimens to preserve biological material in the best possible state for later analysis. The finder of injured specimens has the responsibility to ensure that evidence intrinsic to the specimen is not unnecessarily disturbed, unless to remove it from the path of further harm or destruction. Should any island night lizard survive injury, the Service must be contacted regarding their final disposition. The remains must be placed with educational or research institutions holding the appropriate State and Federal permits, such as the Santa Barbara Natural History Museum (Contact: Paul Collins, Santa Barbara Natural History Museum, Vertebrate Zoology Department, 2559 Puesta Del Sol, Santa Barbara, California 93460, (805) 682-4711, extension 321). The Navy must make arrangements with the Museum regarding proper disposition of potential museum specimens prior to implementation of any project actions.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to use their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. We recommend the following:

1. The Navy should conduct additional habitat restoration and erosion control along Jackson Highway, Harrington Road, and Skyline Drive to create a more continuous corridor of high-quality island night lizard habitat between the existing high-quality habitats to the east and west of the action area;

2. The Navy should monitor all bird strikes caused by the turbines and report the results in the Navy's annual reports to the Service; and

3. The Navy should take steps to reduce bird collisions with the turbines, such as not running the turbines at night during migration seasons.

REINITIATION NOTICE

This concludes formal consultation on the effects of the wind energy project on San Nicolas Island. Reinitiation of formal consultation is required if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may adversely affect listed species or critical habitat in a manner or to an extent not considered in this biological opinion; (3) the agency action is subsequently modified in a manner that causes an effect to a listed species or critical habitat that was not considered in this biological opinion; or (4) a new species is listed or critical habitat designated that may be affected by this action (50 CFR 402.16). In instances where the amount or extent of incidental take is exceeded, the exemption issued pursuant to section 7(o)(2) will have lapsed and any further take would be a violation of section 4(d) or 9. Consequently, we recommend that any operations causing such take cease pending reinitiation.

If you have any questions regarding this biological opinion, please contact David Simmons of my staff at (805) 644-1766, extension 368.

Sincerely,

Diane K. Noda

Diane K. Noda
Field Supervisor

LITERATURE CITED

Brittell, J.D., J.M. Brown, and R.L. Eaton. 1976. Marine shoreline fauna of Washington, Vol. II. Washington Department of Game and Ecology, Olympia, Washington. 341 pp.

Burger, A.E. and D.M. Fry. 1993. Effects of oil pollution on seabirds in the northeast Pacific. Pages 254-263 In: K. Vermeer, K.T. Briggs, K.H. Morgan, and D. Siegel-Causey, eds. The status, ecology, and conservation of marine birds of the North Pacific. Canadian Wildlife Service Special Publication, Ottawa.

Cairns, W.E. and I.A. MacLaren. 1980. Status of the piping plover on the east coast of North America. American Birds 34(2):206-208.

Cairns, W.E. 1982. Biology and behavior of breeding piping plovers. Wilson Bull. 94:531-545.

California Native Plant Society. 1996. Policy on invasive exotic plants. http://www.cnps.org/cnps/archive/exotics.php.

Centers for Disease Control. 2004. West Nile Virus. Retrieved from: http://www.cdc.gov/ncidod/dvbid/westnile/birdspecies.htm/. Accessed: January 2008.

Fellers, G.M. and C.A. Drost. 1991a. Xantusia riversiana Cope, Island Night Lizard, in Catalogue of American Amphibians and Reptiles. Society for the Study of Amphibians and Reptiles. Davis, California.

Fellers, G.M. and C.A. Drost. 1991b. Ecology of the island night lizard, Xantusia riversiana, on Santa Barbara Island, California. Herpetological Review 5: 28-78.

Fellers, G.M. and C.A. Drost. Undated. The island night lizard - a unique Channel Islands endemic. Unpublished report.

Fellers, G.M.., C.A. Drost, W.J. Muntz, and T. Murphey. 1998. Ecology of the Island Night Lizard, Xantusia riversiana, on San Nicolas Island, California. U.S. Navy, Point Mugu, and Biological Research Division, U.S. Geological Survey, Point Reyes National Seashore, California.

Lauten, D.J., K.A. Castelein, E. Seckinger, and E.P. Gaines. 2006a. The distribution and reproductive success of the western snowy plover along the Oregon coast - 2005. The Oregon Natural Heritage Information Center Institute for Natural Resources, Portland, Oregon.

Lauten, D.J., K.A. Castelein, S. Weston, K. Eucken, and E.P. Gaines. 2006b. The distribution and reproductive success of the western snowy plover along the Oregon coast - 2006. The Oregon Natural Heritage Information Center Institute for Natural Resources, Portland, Oregon.

Mautz, W.J. 2001. The biology and management of the island night lizard on San Clemente Island. Final report. U.S. Navy, Natural Resources Management Branch, Southwest Division Naval Facilities Engineering Command, San Diego, California. 69 pp.

National Audubon Society. 2006. West Nile virus. Retrieved from: http://www.audubon.org/bird/wnv/. Accessed January 2008.

Oregon Department of Fish and Wildlife. 1994. Oregon conservation program for the western snowy plover (*Charadrius alexandrinus nivosus*). Final draft. Portland, Oregon. 56 pp.

Page, G.W. and L.E. Stenzel (eds.). 1981. The breeding status of the snowy plover in California. Western Birds 12(1):1-40.

Page, G.W., F.C. Bidstrup, R.J. Ramer, and L.E. Stenzel. 1986. Distribution of wintering snowy plovers in California and adjacent states. Western Birds 17(4):145-170.

Page, G.W., L.E. Stenzel, W.D. Shuford, and C.R. Bruce. 1991. Distribution and abundance of the snowy plover on its western North American breeding grounds. Journal of Field Ornithology 62(2):245-255.

Page, G.W., J.S. Warriner, J.C. Warriner, and P.W.C. Paton. 1995. Snowy plover (*Charadrius alexandrinus*). In The Birds of North America, No. 154 (A. Poole and F. Gill, eds.). The Academy of Natural Sciences, Philadelphia, Pennsylvania, and The American Ornithologists' Union, Washington, D.C. 24 pp.

Page, G.W. 2006. Point Reyes Bird Observatory, Stinson Beach, California. Comparison of the 2005 and 2006 snowy plover surveys of the Pacific coast. Electronic file sent to U.S. Fish and Wildlife Service. 8 pp.

Pearson, S.F, C. Sundstrom, K. Brennan, and M. Fernandez. 2006. Snowy plover distribution, abundance, and reproductive success: 2006 research progress report. Washington Department of Fish and Wildlife, Olympia, Washington.

Powell, A.N. 1996. Western snowy plover use of state-managed lands in southern California, 1995. California Department of Fish and Game, Wildlife Management Division, Bird and Mammal Conservation Program Report 96-103. Sacramento, California. 14 pp.

Powell, A.N., J.M. Terp, C.L. Collier, and B.L. Peterson. 1997. The status of western snowy plovers (*Charadrius alexandrinus nivosus*) in San Diego County, 1997. Report to the California Department of Fish and Game, Sacramento, California, and U.S. Fish and Wildlife Service, Carlsbad, California, and Portland, Oregon. 34 pp.

Schwendiman, J.L. 1975. Coastal dune stabilization in the Pacific Northwest. International Journal of Biometeorology 21:281-289.

Slobodchikoff, C.N. and J.T. Doyen. 1977. Effects of *Ammophila arenaria* on sand dune arthropod communities. Ecology 58:1171-1175.

Stenzel, L.E., J.C. Warriner, J.S. Warriner, K.S. Wilson, F.C. Bidstrup, and G.W. Page. 1994. Long-distance breeding dispersal of snowy plovers in western North America. Journal of Animal Ecology 63:887-902.

Stern, M.A., J.S. McIver, and G.A. Rosenberg. 1990. Investigations of the western snowy plover at the Coos Bay North Spit and adjacent sites in Coos and Curry Counties, Oregon, 1990. Report to Oregon Department of Fish and Wildlife Nongame Program. 33 pp.

Stern, M.A., J.S. McIver, and G.A. Rosenberg. 1991. Nesting and reproductive success of snowy plovers along the south Oregon coast, 1991. Report to Oregon Department of Fish and Wildlife-Nongame, Roseburg, Oregon, and Coos Bay District, Bureau of Land Management, North Bend, Oregon. 18 pp.

SWCA. 2007. The western snowy plover in Los Angeles County, California: Winter- Spring 2007. Prepared for the California Department of Fish and Game, Office of Oil Spill Response. South Pasadena, California.

U.S. Fish and Wildlife Service. 1980. Selected Vertebrate Endangered Species of the Seacoast of the United States - Island Night Lizard. FWS/OBS-80/01.36. National Fish and Wildlife Laboratory. Fort Collins, Colorado.

U.S. Fish and Wildlife Service. 1993. Endangered and threatened wildlife and plants; determination of threatened status for the Pacific coast population of the western snowy plover; final rule. Federal Register 58(42):12864-12874.

U.S. Fish and Wildlife Service. 2006. Endangered and threatened wildlife and plants; 12-month finding on a petition to delist the Pacific coast population of the western snowy plover. Federal Register 71:20607-20624. April 21, 2006.

U.S. Fish and Wildlife Service. 2007. Recovery plan for the western snowy plover, Pacific coast population. Sacramento, California.

U.S. Fish and Wildlife Service. 2010. Western snowy plover species page on Arcata Fish and Wildlife Office website. Retrieved from http://www.fws.gov/arcata/es/birds/WSP/plover.html. Accessed August 2010.

U.S. Geological Survey. 2006. West Nile virus maps. Retrieved from: http://diseasemaps.usgs.gov/wnv_us_bird.html. Accessed January 2008.

U.S. Navy. 2007. Biological opinion 2007 annual report for Naval Base Ventura County San Nicolas Island, California. January 2008. Naval Base Ventura County, Point Magu, California. 34 pp.

U.S. Navy. 2008. Biological opinion 2008 annual report for San Nicolas Island, California. January 2009. Naval Base Ventura County, Point Magu, California. 17 pp.

U.S. Navy. 2009. Biological opinion 2009 annual report for San Nicolas Island, California. February 2010. Naval Base Ventura County, Point Magu, California. 61 pp.

U.S. Navy. 2010a. San Nicolas Island wind energy project: biological assessment. Naval Base Ventura County, Point Magu, California. 20 pp.

U.S. Navy. 2010b. Preliminary final baseline avian use and risk assessment for the San Nicolas Island wind energy project, San Nicolas Island, Ventura, California. U.S. Navy, Naval Facilities Engineering Command Southwest, San Diego, California. 78 pp.

Warriner, J.S., J.C. Warriner, G.W. Page, and L.E. Stenzel. 1986. Mating system and reproductive success of a small population of polygamous snowy plovers. Wilson Bulletin 98(1):15-37.

Wilson-Jacobs, R. and E.C. Meslow. 1984. Distribution, abundance, and nesting characteristics of snowy plovers on the Oregon coast. Northwest Science 58(1):40-48.

IN LITTERIS

Drost, Charles. 2009. Email to Grace Smith (U.S. Navy) regarding November 2009 habitat assessment on San Nicolas Island.

Loomis, Rebecca. U.S. Navy. July 1, 2010, email regarding the San Nicolas Island wind energy project and island night lizards

PERSONAL COMMUNICATIONS

Palacios, Eduardo. Biologist. Communication on January 16, 2008, regarding the population status of the Baja California, Mexico portion of Pacific Coast population of the western snowy plover.

Ruane, Martin. Ecologist, U.S. Navy. Telephone communication on July 8, 2010 regarding the San Nicolas Island wind energy project, feral cats on SNI, and the status of island night lizards and snowy plovers on the island.

Appendix I: Public Comments

(1) Ventura County Star Public Notice

(2) CDFG Memorandum dated October 20, 2010 to NAVFAC Southwest Coastal IPT Natural Resource Specialist regarding the Naval Base Ventura County San Nicolas Island Integrated Natural Resources Management Plan.

(3) Draft Final SNI INRMP Master Comment Matrix prepared by Tierra Data Inc.

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Page 1 of 1

PUBLIC NOTICE:

LEGAL ADVERTISEMENT OF THE DEPARTMENT OF DEFENSE, DEPARTMENT OF THE NAVY NOTICE OF AVAILABILITY OF THE PUBLIC DRAFT INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN FOR NAVAL BASE VENTURA COUNTY SAN NICOLAS ISLAND.

The Naval Base Ventura County (NBVC) San Nicolas Island (SNI) Public Draft Integrated Natural Resources Management Plan (INRMP) will be available for 30-day public review beginning September 15, 2010 through October 15, 2010 at the City of Oxnard Library, Main Library, 251 South A Street, Oxnard, California 93030, (805) 385-7500. The INRMP will also be available for public review through Tierra Data Inc.'s (TDI's) website < http://www.tierradata.com> where a File Transfer Protocol (FTP) link to the SNI INRMP and access instructions is provided. Instructions for providing comments on the SNI INRMP are also included on TDI's website. If you experience any technical difficulties with accessing TDI's website or the FTP link please email Chelsea Snover at Chelsea@tierradata.com with "SNI INRMP FTP" in the subject field of your email. The purpose of the INRMP is to provide NBVC SNI with a viable framework for managing natural resources. The INRMP meets the requirements of the Sikes Act Improvement Act (SAIA), all applicable U.S. Department of Defense, U.S. Department of the Navy and NBVC regulations. Please submit comments to Michelle Cox, Natural Resources Specialist at Naval Facilities Engineering Command Southwest 2730 McKean St. Bldg 291 San Diego, CA 92136; 619.556.9759; 619.556.0195 (FAX); michelle.c.cox@navy.mil by October 15, 2010.

Publish: Sept. 15, 16, 17, 2010 Ad No.252106

California Natural Resources Agency **ARNOLD SCHWARZENEGGER**, *Governor*
DEPARTMENT OF FISH AND GAME **JOHN McCAMMAN,** *Director*

South Coast Region
4949 Viewridge Avenue
San Diego, CA 92123
(858) 467-4201
http://www.dfg.ca.gov

October 20, 2010

Michelle Cox, Natural Resource Specialist
Naval Facilities Engineering Command, Southwest
Coastal Integrated Products Team
2739 McKean St., Bldg. 291
San Diego, CA 92101

Subject: Naval Base Ventura County San Nicolas Island Integrated Natural Resources Management Plan

Dear Ms. Cox:

The California Department of Fish and Game (Department) appreciates the opportunity to comment on the above draft document, in accordance with the January 31, 2006 Memorandum of Understanding (MOU) between the Department of Defense (DOD), the U.S. Fish and Wildlife Service (USFWS), and the International Association of Fish and Wildlife Agencies, on development of an Integrated Natural Resources Management Program, and DOD's "Updated Guidance for Implementation of the Sikes Act Improvement Act, October 10, 2002." The purpose of the Integrated Natural Resources Management Plan (INRMP) is to provide integrated, comprehensive, ecosystem-based resource management strategies and recommend goals for Naval Base Ventura County San Nicolas Island's natural resources for a 5-year period.

Naval Base Ventura County San Nicolas Island encompasses 14,258 acres and lies 62 miles southwest of Point Mugu, California. It is located in a transitional zone between central and southern California climates and habitats, and therefore contains great natural diversity and several sensitive species, including the State-listed island fox.

The military mission of Naval Base Ventura County San Nicolas Island requires much of the land area to be left as open space. The INRMP focuses on management of these open lands, and discusses management of fish and wildlife, wetlands and riparian habitats, coastal resources, threatened and endangered species, grazing and croplands, wildland and urban forestry, pests, outdoor recreation, conservation law enforcement, lands and grounds maintenance, invasive plants, bird/wildlife aircraft strike hazards, and wildland fire.

As trustee for the State's fish and wildlife resources, the Department has responsibility for the conservation, protection, and management of fish, wildlife, native plants, and habitat necessary for biologically sustainable populations of those species. We are hopeful the following comments will assist in finalizing an INRMP that fulfills the goal of the INRMP "to utilize adaptive management to maintain long term ecosystem health and minimize impacts to existing habitats consistent with the operational requirements of USDOD's training and testing mission":

1) Section 3.6.4 Mammals states, "After the extensive cat trapping effort in 2009 and early 2010 it is suspected very few cats remain. These few remaining cats will likely be successfully captured and removed by the end of 2010. After all cats are assumed to be removed,

monitoring will be in place to confirm success with this specific removal effort. Future monitoring to ensure identification of potential re-introduction of cats and other vertebrate species will occur. A full discussion of feral cats and their associated removal program is presented in Section 3.10: Invasive Wildlife Damage."

Comment: Update Section 3.6.4 to state that since the removal of two cats at the end of June 2010, there has been no detection of additional cats during over 3,000 camera trap nights or their sign in over 270 km of sign search.

2) Section 4.6.1 Terrestrial Invasive Exotic Species Current Management states, "Implementation of the feral cat control and removal program was accomplished from 2009-2010. A majority of the feral cats at SNI have been removed as a result of that program. Monitoring for feral cats using remote video and trapping at SNI continues to remain a priority management action."

Comment: Given that additional feral cats may be detected and trapping may resume, Section 4.6.1 should discuss the measures that will be implemented to minimize impacts to incidentally-captured island foxes including:

- The trap checking protocol that will be used in order to prevent trap transmitter system failures and associated injuries to island foxes.

- Minimizing the risk of hypothermia and hyperthermia to island foxes by closing traps during extreme weather conditions (Santa Ana winds, rain, and when the ambient temperature is below 40 degrees F or above 80 degrees F) and relocating traps at which incidentally-captured island foxes were hypothermic or hyperthermic.

- Not opening traps before July 1 to minimize impacts to lactating females and their pups.

- Plans to immediately notify CDFG Region 5 staff of island fox injuries associated with the feral cat removal project, so that CDFG has the opportunity to assist in developing additional methods to reduce island fox injuries, which even if treated could decrease the reproductive potential of the injured individuals due to a reduction of their ability to hunt and provide food for dependent young.

Thank you again for the opportunity to provide input to this very important document. We look forward to continued communication and coordination regarding the INRMP. If you have any questions about this letter, please contact Nancy Frost at (858) 467-4208 or email her at NFrost@dfg.ca.gov.

Sincerely,

Edmund Pert
Regional Manager
South Coast Region

cc: Ms. Helen Birss, Los Alamitos, California
Ms. Betty Courtney, Santa Clarita, California
Mr. Martin Potter, Ojai, California
Ms. Terri Stewart, San Diego, California
Ms. Kim McKee-Lewis, San Diego, California See next page for signed signature page

monitoring will be in place to confirm success with this specific removal effort. Future monitoring to ensure identification of potential re-introduction of cats and other vertebrate species will occur. A full discussion of feral cats and their associated removal program is presented in Section 3.10: Invasive Wildlife Damage."

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cc: Ms. Helen Birss, Los Alamitos, California
Ms. Betty Courtney, Santa Clarita, California
Mr. Martin Potter, Ojai, California
Ms. Terri Stewart, San Diego, California
Ms. Kim McKee-Lewis, San Diego, California

COMMENT MATRIX

COMMENT INCORPORATOR	**DATE**
Mark Zegler (MZ), Senior Conservation Scientist, Tierra Data Inc.	October – November 2010
COMMENTOR	**ORGANIZATION OF COMMENTOR**
Master Comment Matrix	SNI INRMP Revision Working Group (Navy Planning Team, USFWS, NMFS, CDFG, TDI)
TITLE OF DOCUMENT	**DATE OF DOCUMENT**
San Nicolas Island INRMP Public Draft (Draft-Final INRMP)	September 2010

NO.	PAGE NO.	PARA-GRAPH	LINE NO.	FIGURE/ TABLE NO.	Commenter	RECOMMENDED CHANGES *(Exact wording of suggested change)*	INCORP *(Yes, No, N/A)*	HOW COMMENT WAS INCORPORATED *(If not incorporated, why?)*
1.	Global				Valerie Vartanian (NAVFACSW)	Comment: Change all reference throughout document of "NBVC Landscape Master Plan" to "San Nicolas Island Landscaping Plant List."	Yes (MZ)	All Chapters and Appendices reviewed to replace the "NBVC Landscape Master Plan" with the "San Nicolas Island Landscaping Plant List."
2.	i	Approval			Michelle Cox (NAVFACSW)	Approval – U.S. Navy Naval Base Ventura County "This document fulfills the requirements for the Integrated Natural Resource Management Plan in accordance with the Sikes Act (16 U.S.C. 670a et seq.) as amended and DODINST 4715.3 and OPNAVINST 5090.1C." Comment: Revise U.S. Navy Naval Base Ventura County approval language to be consistent with USFWS, NMFS, and CDFG signature page approval language. Add a sentence on the Tripartite MOU.	Yes (MZ)	Revised as follows: This Integrated Natural Resources Management Plan (INRMP) fulfills the requirements for the INRMP in accordance with the Sikes Act (16 U.S.C. 670a et seq.) as amended and DODINST 4715.3 and OPNAVINST 5090.1C. This document was prepared and reviewed in coordination with U.S. Department of the Interior, Fish and Wildlife Service, and California Department of Fish and Game South Coast Region in accordance with the 2006 Memorandum of Understanding for a Cooperative Integrated Natural Resource Management Program on Military Installations.

COMMENT MATRIX

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3.	iii	Approval			Michelle Cox (NAVFACSW)	Approval – U.S. Navy Naval Facilities Engineering Command "This document fulfills the requirements for the Integrated Natural Resource Management Plan in accordance with the Sikes Act (16 U.S.C. 670a et seq.) as amended and DODINST 4715.3 and OPNAVINST 5090.1C." Comment: Revise U.S. Navy Naval Facilities Engineering Command approval language to be consistent with USFWS, NMFS, and CDFG signature page approval language. Add a sentence on the Tripartite MOU.	Yes (MZ)	Revised as follows: This Integrated Natural Resources Management Plan (INRMP) fulfills the requirements for the INRMP in accordance with the Sikes Act (16 U.S.C. 670a et seq.) as amended and DODINST 4715.3 and OPNAVINST 5090.1C. This document was prepared and reviewed in coordination with U.S. Department of the Interior, Fish and Wildlife Service, and California Department of Fish and Game South Coast Region in accordance with the 2006 Memorandum of Understanding for a Cooperative Integrated Natural Resource Management Program on Military Installations.
4.	v	Approval			Michelle Cox (NAVFACSW)	Approval – U.S. Fish and Wildlife Service "This document fulfills the requirements for the Integrated Natural Resource Management Plan in accordance with the Sikes Act (16 U.S.C. 670a et seq.) as amended and DODINST 4715.3 and OPNAVINST 5090.1C." Comment: Revise U.S. Fish and Wildlife Service approval language to be consistent with Navy, NMFS, and CDFG signature page approval language. Delete reference to OPNAV on non-DOD pages. Add a sentence on the Tripartite MOU.	Yes (MZ)	Revised as follows: This Integrated Natural Resources Management Plan (INRMP) was prepared and reviewed in coordination with the Department of the Navy and California Department of Fish and Game South Coast Region in accordance with the 2006 Memorandum of Understanding for a Cooperative Integrated Natural Resource Management Program on Military Installations. The U.S. Department of the Interior, Fish and Wildlife Service concurs that the INRMP will provide a framework to manage natural resources on Naval Base Ventura County Naval Outlying Landing Field San Nicolas Island.

COMMENT MATRIX

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5.	vii	Approval			Michelle Cox (NAVFACSW)	Approval – U.S. National Marine Fisheries Service "This document fulfills the requirements for the Integrated Natural Resource Management Plan in accordance with the Sikes Act (16 U.S.C. 670a et seq.) as amended and DODINST 4715.3 and OPNAVINST 5090.1C." Comment: Revise U.S. National Marine Fisheries Service approval language to be consistent with Navy, USFWS, and CDFG signature page approval language. Delete reference to OPNAV on non-DOD pages. Add a sentence on the Tripartite MOU.	Yes (MZ)	Revised as follows: This Integrated Natural Resources Management Plan (INRMP) was prepared and reviewed in coordination with the National Marine Fisheries Southwest Regional Office (Service). This document was adequately revised to satisfy comments and concerns presented by Service representatives. The Service concurs that this INRMP will provide a framework to manage natural resources on Naval Base Ventura County Naval Outlying Landing Field San Nicolas Island.
6.	ix	CDFG Approval			Working Group Draft Final Doc. Review Mtg. (21 OCT 2010)	Approval – California Department of Fish and Game "The California Department of Fish and Game (Department), as the designated state wildlife agency has participated in the review of this Integrated Natural Resources Management Plan (INRMP). By my signature below, the Department concurs that the INRMP will provide a framework to manage natural resources on Naval Base Ventura County Naval Outlying Landing Field San Nicolas Island for the next twenty years." Comment: Revise CDFG Approval Language to be consistent USFWS, NMFS, and Navy signature page approval language. Delete reference to OPNAV on non-DOD pages. Add a sentence on the Tripartite MOU.	Yes (MZ)	Revised as follows: This Integrated Natural Resources Management Plan (INRMP) was prepared and reviewed in coordination with the Department of the Navy and the U.S. Department of the Interior, Fish and Wildlife Service in accordance with the 2006 Memorandum of Understanding for a Cooperative Integrated Natural Resource Management Program on Military Installations. The California Department of Fish and Game concurs that this INRMP will provide a framework to manage natural resources on Naval Base Ventura County Naval Outlying Landing Field San Nicolas Island.
7.	ix	CDFG Approval			Michelle Cox (NAVFACSW)	Revise Approval Signatory from South Coast Regional Manager to CDFG Director: John McCamman, Director, California Department of Fish and Game, Sacramento, CA	Yes (MZ)	CDFG signatory revised as follows: John McCamman, Director, California Department of Fish and Game, Sacramento, CA

COMMENT MATRIX

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8.	xi	Approval			Michelle Cox (NAVFACSW)	Approval – U.S. Navy Naval Base Ventura County "This document fulfills the requirements for the Integrated Natural Resource Management Plan in accordance with the Sikes Act (16 U.S.C. 670a et seq.) as amended and DODINST 4715.3 and OPNAVINST 5090.1C." Comment: Revise U.S. Navy Naval Base Ventura County approval language to be consistent with USFWS, NMFS, and CDFG signature page approval language. Add a sentence on the Tripartite MOU.	Yes (MZ)	Revised as follows: This Integrated Natural Resources Management Plan (INRMP) fulfills the requirements for the INRMP in accordance with the Sikes Act (16 U.S.C. 670a et seq.) as amended and DODINST 4715.3 and OPNAVINST 5090.1C. This document was prepared and reviewed in coordination with U.S. Department of the Interior, Fish and Wildlife Service, and California Department of Fish and Game South Coast Region in accordance with the 2006 Memorandum of Understanding for a Cooperative Integrated Natural Resource Management Program on Military Installations.
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11.	xvii	Approval			Michelle Cox (NAVFACSW)	Approval – U.S. National Marine Fisheries Service "This document fulfills the requirements for the Integrated Natural Resource Management Plan in accordance with the Sikes Act (16 U.S.C. 670a et seq.) as amended and DODINST 4715.3 and OPNAVINST 5090.1C." Comment: Revise U.S. National Marine Fisheries Service approval language to be consistent with Navy, USFWS, and CDFG signature page approval language. Delete reference to OPNAV on non-DOD pages. Add a sentence on the Tripartite MOU.	Yes (MZ)	Revised as follows: This Integrated Natural Resources Management Plan (INRMP) was prepared and reviewed in coordination with the National Marine Fisheries Southwest Regional Office (Service). This document was adequately revised to satisfy comments and concerns presented by Service representatives. The Service concurs that this INRMP will provide a framework to manage natural resources on Naval Base Ventura County Naval Outlying Landing Field San Nicolas Island.

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12.	xix	CDFG Approval			Working Group Draft Final Doc. Review Mtg. (21 OCT 2010)	Approval – California Department of Fish and Game "The California Department of Fish and Game (Department), as the designated state wildlife agency has participated in the review of this Integrated Natural Resources Management Plan (INRMP). By my signature below, the Department concurs that the INRMP will provide a framework to manage natural resources on Naval Base Ventura County Naval Outlying Landing Field San Nicolas Island for the next twenty years." Comment: Revise CDFG Approval Language to be consistent USFWS, NMFS, and Navy signature page approval language. Delete reference to OPNAV on non-DOD pages. Add a sentence on the Tripartite MOU.	Yes (MZ)	Revised as follows: This Integrated Natural Resources Management Plan (INRMP) was prepared and reviewed in coordination with the Department of the Navy and the U.S. Department of the Interior, Fish and Wildlife Service in accordance with the 2006 Memorandum of Understanding for a Cooperative Integrated Natural Resource Management Program on Military Installations. The California Department of Fish and Game concurs that this INRMP will provide a framework to manage natural resources on Naval Base Ventura County Naval Outlying Landing Field San Nicolas Island.

COMMENT MATRIX

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13.	1-3	1.3 Paragraph 3			Working Group Draft Final Doc. Review Mtg. (21 OCT 2010)	1.3 Location and Planning Footprint "This INRMP will be used to manage of all of SNI lands, and adjacent waters of the nearshore environment with which the Navy interfaces. The previous (2005) INRMP did not specifically address intertidal or the nearshore environment beyond MHW. This INRMP will address the expanded footprint, including all waters surrounding the island within the 300-foot (91-m) isobath or 1.0 nautical mile (nm) distance from shore, whichever is greater (see Map 1-1)." Comment: The Working Group discussed the need to explain to the reader where the ocean cut off exists in the marine environment in regards to the INRMP planning footprint. The Working Group decided that a discussion will be developed for inclusion in Chapter 1 Section 1.3 Location and Planning Footprint to explain where the planning footprint is located in the marine environment and clarify why cetaceans are not included as a component of the INRMP. John Ugoretz provided the following text to address this comment: "Marine Species considered in this INRMP include those closely associated with the island and regularly occurring within the expanded footprint. This includes seasonally occurring marine mammals that haul out or breed on SNI as well as the permanent southern sea otter population. Oceanic species, such as large cetaceans or highly migratory fishes, which may occasionally occur within the expanded footprint, though on a transient or infrequent basis, are not included. Offshore and oceanic species are addressed on an as-needed basis in species specific consultations and permit processes for Navy activities offshore SNI."	Yes (MZ)	Text revised as follows: "This INRMP will be used to manage all of SNI lands, and adjacent waters of the nearshore environment with which the Navy interfaces. The previous (2005) INRMP did not specifically address intertidal or the nearshore environment beyond MHW. This INRMP will address the expanded footprint, including all waters surrounding the island within the 300-foot (91-m) isobath or 1.0 nautical mile (nm) distance from shore, whichever is greater (see Map 1-1). Marine Species considered in this INRMP include those closely associated with the island and regularly occurring within the expanded footprint. This includes seasonally occurring marine mammals that haul out or breed on SNI as well as the permanent southern sea otter population. Oceanic species, such as large cetaceans or highly migratory fishes, which may occasionally occur within the expanded footprint, though on a transient or infrequent basis, are not included. Offshore and oceanic species are addressed on an as-needed basis in species specific consultations and permit processes for Navy activities offshore SNI."
14.	1-11			Figure 1-1	Mark Zegler (TDI)	1.5.3 Military Land Use and Categories of Operations Figure 1-1. Organization Chart Comment: Spell Check Organizational Chart	Yes (MZ)	Figure 1-1 spell checked.
15.	1-13	1			Michelle Cox (NAVFACSW) and Valerie Vartanian (NAVFACSW)	1.7 INRMP Vision, Goals, and Objectives Delete standards of success	Yes (MZ)	Standards of success deleted from Section 1.7 INRMP Vision, Goals, and Objectives.

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16.	1-14			Table 1-2, Table 1-3	Michelle Cox (NAVFACSW) and Valerie Vartanian (NAVFACSW)	1.7 INRMP Vision, Goals, and Objectives Delete Table 1-2 and Table 1-3 and any reference to.	Yes (MZ)	Table 1-2 and Table 1-3 deleted along with any reference to them.
17.	2-20 to 2-21				Working Group Draft Final Doc. Review Mtg. (21 OCT 2010)	2.2.1 Landscaping and Grounds Comment: The Working Group discussed the fact that the landscaping list discussed in section of 2.2.1 Landscaping and Grounds was based on the NBVC Approved Plant List. This Approved Plant List was developed for Point Mugu and was not intended to be applicable for use on SNI. Members of the Working Group from NBVC Environmental Division agreed to review and revise 2.2.1 Landscaping and Grounds in order to reflect the changes that will occur during the development of the new landscaping plat list for SNI.	Yes (MZ)	Refer to Valerie Vartanian (NAVFACSW) comments for recommend changes to implement Working Group comments.
18.	2-20	4th Paragraph on Pg 2-20			Valerie Vartanian (NAVFACSW)	2.2.1 Landscaping and Grounds Future landscaping at SNI will follow the guidance set forth in the NBVC Smart Landscape Master Plan – Landscape Plant Selection Guide. Comment: Change to "Future landscaping at SNI will follow the guidelines set forth in the San Nicolas Island Landscaping Plant List."	Yes (MZ)	Text revised per comment.
19.	2-20	5th Paragraph on Pg 2-20			Valerie Vartanian (NAVFACSW)	2.2.1 Landscaping and Grounds The purpose of the NBVC Smart Landscape Master Plan – Landscape Plant Selection Guide is to provide procedures for base personnel to select appropriate plant stock that is not considered invasive at this time to this region. Comment: Change to "The purpose of the San Nicolas Island Landscaping Plant List is to provide a clear set of approved plants that are not known to be invasive to the island."	Yes (MZ)	Text revised per comment.
20.	2-20	5th Paragraph on Pg 2-20			Valerie Vartanian (NAVFACSW)	2.2.1 Landscaping and Grounds The NBVC Landscape Plant Selection Guide – Approved Plant List is the initial guideline for identifying the appropriate landscaping to be used at SNI; however, all plant selections (outdoor landscape or indoor plants) for SNI must be approved by appropriate staff in NBVC ED. Comment: Delete "The NBVC Landscape Plant Selection Guide – Approved Plant List is the initial guideline for identifying the appropriate landscaping to be used at SNI; however." Start sentence with "All plant selections …"	Yes (MZ)	Text revised as follows: "All plant selections (outdoor landscape or indoor plants) for SNI must be approved by appropriate staff in NBVC Environmental Division. Specifically, landscape designs and plant lists shall be reviewed and approved by the Installation Natural Resource Specialist and the NAVFAC Landscape Architect in the planning stages of project design."

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21.	2-20	6th Paragraph on Pg 2-20			Valerie Vartanian (NAVFACSW)	2.2.1 Landscaping and Grounds Comment: Delete "For each project, California native species from the NBVC Approved Plant List shall constitute 100 percent of the plant material within each stratum (herb, shrub, and tree). The determination of whether cultivars are considered native or exotic will be made on a project-by-project basis by the Installation Natural Resource Specialist and the NAVFAC Landscape Architect."	Yes (MZ)	Discussion deleted per comment.
22.	2-21	1st Paragraph on Pg 2-21			Valerie Vartanian (NAVFACSW)	2.2.1 Landscaping and Grounds This NBVC Approved Plant List is updated periodically. Comment: Change to "This San Nicolas Island Landscaping Plant List is updated periodically."	Yes (MZ)	Text revised per comment.
23.	2-21	2nd Paragraph on Pg 2-21		Table 2-3	Valerie Vartanian (NAVFACSW)	2.2.1 Landscaping and Grounds Plants unacceptable for landscaping at SNI under any circumstances include all plants on the Cal-IPC Invasive Plant Inventory, all plants on the San Diego County Ornamental Invasives Plant Guide, and all non-native grasses. Invasive exotic plants that are unacceptable for landscaping under any circumstances at SNI are identified in Table 2-3. Table 2-3. Naval Base Ventura County Invasive Plant List Comment: Delete 1st paragraph and Table 5-4.	Yes (MZ)	Discussion in paragraph and Table 2-3 deleted per comment.
24.	2-21	3rd Paragraph on Pg 2-21			Valerie Vartanian (NAVFACSW)	2.2.1 Landscaping and Grounds The NBVC Approved Landscaping Plant List is included in this INRMP as Appendix F. Comment: Change to "The San Nicolas Island Landscaping Plant List is included in this INRMP as Appendix F."	Yes (MZ)	Text revised per comment.
25.	3-28	3			Michelle Cox (NAVFACSW)	3.6.1 Invertebrates Include space between island and snail. Change throughout document.	Yes (MZ)	Space included between island and snail throughout the INRMP document.

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26.	3-34	Paragraph 3, 4, and 5			Michelle Cox (NAVFACSW) and Charles Drost (USGS Southwest Biological Science Center)	3.6.4 Mammals Deer mice (Peromyscus maniculatus) are the only nonvolant vertebrate that occurs on all eight California Channel Islands (Pergams and Ashley 2000). There is a high abundance on several of the islands, which suggests that they influence the ecology of those islands. Their isolation on the Channel Islands has resulted in multiple genetically and morphologically distinct subspecies (Pergams and Ashley 2000). This evolutionary process contributes much to the biodiversity of the islands and makes them an important subject for investigation of evolutionary history and adaptive radiation (Mearns 1897; Pergams and Ashley 1999; Pergams et al. 2000). On SNI, the San Nicolas Island deer mouse is the only native rodent. Little is known about the biology of this endemic subspecies, so information presented here is mainly derived from data about the mainland species, P. maniculatus, as well as from the other Peromyscus island endemics. The deer mouse breeds year-round, most likely peaking between March and August. They produce two to four litters per year. Litter sizes range from one to nine, with an average of about 3.5 young. They are solitary nesters who are maternally raised until 22-37 days, and reach sexual maturity at approximately 50 days. Deer mice will construct their nests in nearly any sort of closed cover. They utilize slash and forest litter, rock piles, abandoned burrows and logs to form confined areas lined with soft materials such as root fibers, mosses, hair and grass. This sole SNI rodent is a prey item to larger mammals, including the San Nicolas Island fox, and to raptors. The deer mouse is a generalist feeder, foraging on insects (especially at the larval and pupal stages), fungi, leaves, fruits and seeds and animal flesh. They primarily forage on the ground, but at times will climb up into shrubs to search for food. They store large caches of food for winter consumption and are thought to play an important ecosystem role by feeding on larvae and pupae of insects that prey upon plant life. Comment: Delete this discussion from section 3.6.4.	Yes (MZ)	This discussion is deleted from Section 3.6.4.

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27.	3-34	Paragraph 3, 4, and 5			Michelle Cox (NAVFACSW) and Charles Drost (USGS Southwest Biological Science Center)	3.6.4 Mammals Comment: Replace paragraphs 3,4, and 5 with the following discussion: "The deer mouse (Peromyscus maniculatus) is the most numerous and widespread small mammal on the California Channel Islands. Deer mice are the only small mammals on San Nicolas Island, both currently and historically. The island deer mice are larger than typical mainland deer mice, and differ in other aspects of measurements and coloration (von Bloeker 1967, Gill 1980). In the past, the deer mice on each of the Channel Islands have been described as separate subspecies, and the named subspecies on San Nicolas is P. maniculatus exterus (von Bloeker 1967). Deer mice on San Nicolas occur across the entire island, in all habitats. They are typically most numerous in shrub-dominated habitats, such as the large Coreopsis stands on the island. Relative abundance of deer mice on San Nicolas (number of individuals per 100 trap-nights) ranges from lows of 20 to highs of 90 (unpublished monitoring data from San Nicolas, 2005-2010). Compared to some of the other islands, numbers on San Nicolas are moderate, with neither the very high numbers nor the extreme fluctuations seen on Santa Barbara Island (Drost and Fellers 1991). Deer mouse breeding is in the spring on San Nicolas, corresponding to the flush of plant growth following the winter rains. Pregnant and lactating females, and juvenile and subadult mice, have been recorded throughout April and May, but have not been recorded in the fall (unpublished monitoring data). Because of this seasonal breeding pattern, numbers are typically higher in the fall, and lower in the spring. Deer mice on the Channel Islands eat a variety of seeds, fruit, and insects and other invertebrates, and in turn are preyed on (on San Nicolas Island) by Barn Owls, American Kestrels, other birds of prey, island foxes and (formerly, at least) feral cats. The deer mice on San Nicolas Island have not been found to carry Hantavirus, the causative agent of the serious and often fatal respiratory disease in humans (Orrock and Allan 2008)." References: Drost, C. A. and G. M. Fellers. 1991. Density cycles in an island population of deer mice, Peromyscus maniculatus. Oikos 60:351-364. Gill, A. E. 1980. Evolutionary genetics of California Islands Peromyscus. In: Power, D. M. (ed.), The California Islands: Proceedings of a multidisciplinary symposium. Santa Barbara Museum of Natural History, Santa Barbara, CA. Orrock, J. L., and B. F. Allan. 2008. Sin Nombre Virus infection in deer mice, Channel Islands, California. Emerging Infectious Diseases 14:1965-1966. von Bloeker, J. C. 1967. The land mammals of the southern California islands. – In: Philbrick, R. N. (ed.), Proceedings of the symposium on the biology of the California Islands. Santa Barbara Botanic Garden, pp. 245-263.	Yes (MZ)	Discussion inserted into Section 3.6.4 per comment. Reference citations included in this discussion are updated in Chapter 7 References.

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28.	3-34 to 3-35	3.6.4 Last Paragraph	Last		Edmund Pert (CDFG South Coast Region)	3.6.4 Mammals Section 3.6.4 Mammal states, "After the extensive cat trapping effort in 2009 and early 2010 it is suspected very few cats remain. These few remaining cats will likely be successfully captured and removed by the end of 2010. After all cats are assumed to be removed, monitoring will be in place to confirm success with this specific removal effort. Future monitoring to ensure identification of potential re-introduction of cats and other vertebrate species will occur. A full discussion of feral cats and their associated removal program is presented in Section 3.10: Invasive Wildlife Damage." Comment: Update Section 3.6.4 to state that since the removal of two cats at the end of June 2010, there has been no detection of additional cats during over 3,000 camera trip nights or their sign in over 270 km of sign search.	Yes (MZ)	Text revised as follows: "Historically, the only introduced terrestrial mammal was the feral cat which has long been established on SNI and has posed a serious risk to the integrity of various avian and reptile species. Feral cats have been well documented to be responsible for the extinction of many mammal and bird species worldwide, especially within island ecosystems (see Lever 1985; Wolf 2002; Keitt et al. 2005). Cats were introduced to SNI in historic times, probably originally as pets but later possibly for pest control. It is not known when the feral population became established, but Hillinger (1958) reported that large numbers of feral cats were roaming the island by the late 1950s. The size of the population likely fluctuates over time in relation to prey availability and other factors. After the extensive cat trapping effort in 2009 and early 2010 and since the removal of two cats at the end of June 2010, there has been no detection of additional cats during over 3,000 camera trip nights or their sign in over 270 km of sign search. After all cats are assumed to be removed, monitoring will be in place to confirm success with this specific removal effort. Future monitoring to ensure identification of potential re-introduction of cats and other vertebrate species will occur. A full discussion of feral cats and their associated removal program is presented in Section 3.10: Invasive Wildlife Damage."
29.	3-43			Table 3-3	John Ugoretz (NAVAIR)	3.8.1 Federal Listed Species and Critical Habitat Comment: I noticed some formatting errors for the tables in Section 3 of the INRMP. In some cases the Latin names are in parenthesis (e.g. Table 3-3, 3-5,). In others, they are simply added after the common name (e.g. Table 3-4, 3-6, 3-7). Also, Table 3-7 is lacking italicization for the Latin names altogether.	Yes (MZ)	Tables 3-3, 3-4, 3-5, 3-6, and 3-7 revised to be consistent so that all Latin names are italicized and in parentheses.

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30.	3-52 to 3-54			Table 3-4	John Ugoretz (NAVAIR)	3.8.2.1 Special Status Plants Comment: I noticed some formatting errors for the tables in Section 3 of the INRMP. In some cases the Latin names are in parenthesis (e.g. Table 3-3, 3-5,). In others, they are simply added after the common name (e.g. Table 3-4, 3-6, 3-7). Also, Table 3-7 is lacking italicization for the Latin names altogether.	Yes (MZ)	Tables 3-3, 3-4, 3-5, 3-6, and 3-7 revised to be consistent so that all Latin names are italicized and in parentheses.
31.	3-55			Table 3-5	John Ugoretz (NAVAIR)	3.8.2.2 Terrestrial Invertebrates Comment: I noticed some formatting errors for the tables in Section 3 of the INRMP. In some cases the Latin names are in parenthesis (e.g. Table 3-3, 3-5,). In others, they are simply added after the common name (e.g. Table 3-4, 3-6, 3-7). Also, Table 3-7 is lacking italicization for the Latin names altogether.	Yes (MZ)	Tables 3-3, 3-4, 3-5, 3-6, and 3-7 revised to be consistent so that all Latin names are italicized and in parentheses.
32.	3-57 to 3-59			Table 3-6	John Ugoretz (NAVAIR)	3.8.2.3 Birds Comment: I noticed some formatting errors for the tables in Section 3 of the INRMP. In some cases the Latin names are in parenthesis (e.g. Table 3-3, 3-5,). In others, they are simply added after the common name (e.g. Table 3-4, 3-6, 3-7). Also, Table 3-7 is lacking italicization for the Latin names altogether.	Yes (MZ)	Tables 3-3, 3-4, 3-5, 3-6, and 3-7 revised to be consistent so that all Latin names are italicized and in parentheses.
33.	3-59			Table 3-7	John Ugoretz (NAVAIR)	3.8.2.4 Mammals Comment: I noticed some formatting errors for the tables in Section 3 of the INRMP. In some cases the Latin names are in parenthesis (e.g. Table 3-3, 3-5,). In others, they are simply added after the common name (e.g. Table 3-4, 3-6, 3-7). Also, Table 3-7 is lacking italicization for the Latin names altogether.	Yes (MZ)	Tables 3-3, 3-4, 3-5, 3-6, and 3-7 revised to be consistent so that all Latin names are italicized and in parentheses.
34.	3-61	Southern Sea Otter Subsection Heading			John Ugoretz (NAVAIR)	3.8.2.4 Mammals, Southern Sea Otter Comment: On page 3-61 sea otter's Latin name is not italicized in the heading.	Yes (MZ)	Sea otter's latin name is italicized in the heading.
35.	Ch 4				Mark Zegler (TDI)	4.0 Natural Resource Management Objectives and Strategies Comment: Ensure that management recommendations are referred to as "Objectives and Strategies" throughout the Chapter.	Yes (MZ)	Chapter 4 reviewed to ensure that "Objectives and Strategies" are used consistently throughout the Management Strategy sections.
36.	4-8				Michelle Cox (NAVFACSW)	4.2.1 Water Resources and Water Quality Comment: Combine Objectives – Comply with applicable water quality related regulations or directives to reduce and minimize water pollutants from entering the watershed and nearshore waters.	Yes (MZ)	Objectives combined and revised per comment.
37.	4-10 – 4-12				Michelle Cox (NAVFACSW) and Valerie Vartanian (NAVFACSW)	4.2.2 Soil Conservation Comment: Move the following objective to the end of Soil Conservation Management Strategies – "Objective: Conserve biological crusts and the ecological functions they provide."	Yes (MZ)	Objective moved to the end of Soil Conservation Management Strategies.

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38.	4-12	IV.4			Michelle Cox (NAVFACSW) and Valerie Vartanian (NAVFACSW)	4.2.2 Soil Conservation Delete IV.B. Support research on biological crust diversity and function in order to understand conservation needs.	Yes (MZ)	Strategy IV.B. deleted per comment.
39.	4-12	VB.1			Michelle Cox (NAVFACSW) and Valerie Vartanian (NAVFACSW)	4.2.2 Soil Conservation, Management Strategy V.B.1 V.B.1. Stabilize disturbed soils using vegetation, mulching, spray on adhesives, calcium chloride, or stone/gravel layering. Comment: Delete….using vegetation, mulching, spray on adhesives, calcium chloride, or stone/gravel layering. Replace with….appropriate erosion control methods.	Yes (MZ)	V.B.1 revised as follows - "Stabilize disturbed soils with appropriate erosion control methods."
40.	4-12				Michelle Cox (NAVFACSW) and Valerie Vartanian (NAVFACSW)	4.2.2 Soil Conservation Comment: Create separate strategies for biological crust and place them to support the following objective – Objective: Conserve biological crusts and the ecological functions they provide." VI. Map biological crusts. VII. Support research on biological crust diversity and function in order to understand conservation needs. VIIII. Determine environmental conditions required to maintain functioning biological crust – list threats, strategies to restore, salvage, and promote.	Yes (MZ)	Strategies VI, VII, VIII included to support the "biological crust" objective.
41.	4-27				Michelle Cox (NAVFACSW)	4.3.3.1 Sandy Beaches, Management Strategy Objective: Maintain and protect the attributes of Sandy Beaches to sustain a diverse and abundant invertebrate and wildlife community through the implementation of best management practices and documenting existing species assemblages. Comment: Do not capitalize sandy beaches in objective.	Yes (MZ)	Objective revised as follows: "Maintain and protect the attributes of sandy beaches to sustain a diverse and abundant invertebrate and wildlife community through the implementation of best management practices and documenting existing species assemblages."
42.	4-34				Michelle Cox (NAVFACSW)	4.3.3.6 Offshore Rocks, Management Strategy Objective: Maintain the integrity of the Offshore rocks adjacent to San Nicolas Island to insure a viable community with natural abundance and composition of invertebrates, fish, and wildlife. Comment: Do not capitalize offshore in objective.	Yes (MZ)	Objective revised as follows: "Maintain the integrity of the offshore rocks adjacent to San Nicolas Island to insure a viable community with natural abundance and composition of invertebrates, fish, and wildlife."

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43.	4-44				Michelle Cox (NAVFACSW) and Valerie Vartanian (NAVFACSW)	4.4.3 Birds, Management Strategy IV. Reduce bird/animal aircraft strike hazards A. Collect bird/animal aircraft incident data and maintain records of BASH incidents, including time of day, date, species involved, and location. B. Continue efforts to develop and implement a BASH plan. C. Ensure that SNI natural resources manager attends classes on bird hazards to aircraft operation. D. Mow airfield and adjacent areas to discourage use by avian species. E. Remove potential bird perches from the airfield vicinity. F. Support censuses of the airfield area to determine avian usage patterns. Comment: Add the following sidebar discussion next to IV. A-F. "For more information regarding BASH management refer to Section 4.7.1. BASH Program."	Yes (MZ)	Sidebar discussion added per comment.
44.	4-46	4.4.4			Michelle Cox (NAVFACSW) and Valerie Vartanian (NAVFACSW)	4.4.4. Mammals Comment: Add Terrestrial to Heading. Heading should read as follows: 4.4.4 Terrestrial Mammals	Yes (MZ)	Heading revised as follows: 4.4.4 Terrestrial Mammals
45.	4-47	2nd Paragraph on Pg 4-47			Michelle Cox (NAVFACSW) and Charles Drost (USGS Biological Science Center)	4.4.4 Mammals, Assessment of Current Management Interaction between the environmental program and the pest management and control program have enabled integrated pest management efforts to be compliant with environmental requirements, such as avoiding rodenticide use in developed areas to minimize the risk of poisoning endemic San Nicolas Island deer mouse populations. There are no threats to the San Nicolas Island deer mouse population given this current capacity and ability to coordinate with pest management activities. Comment: Add the following sentence at the end of the discussion in paragraph 2 on page 4-47: "Furthermore, monitoring of the endemic deer mouse populations would be valuable because of their abundance and their twin roles as important plant and seed consumers, and as prey for mammalian and avian predators on the island."	Yes (MZ)	Text added to paragraph per comment.

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46.	4-47	1st Objective			Michelle Cox (NAVFACSW)	4.4.4 Mammals, Management Strategy I. Support small mammal monitoring programs at SNI that assess home range, movement patterns, and prey abundance for mammalian predators. A. Use the San Nicolas Island fox as an indicator species for a small mammal monitoring program. II. Support programs that contribute to maintaining endemic populations of the San Nicolas Island deer mouse and the San Nicolas Island fox. A. Continue to focus on mapping populations of the San Nicolas Island fox and San Nicolas Island deer mouse in order to identify their preferred habitat types and subsequently ensure that management measures protect those areas. III. Support programs to inventory and monitor bat populations on SNI. Comment: Replace fox with deer mouse in Strategy I.A.	Yes (MZ)	Text revised as follows: "I.A. Use the San Nicolas Island deer mouse as an indicator species for a small mammal monitoring program."
47.	4-56	IV			Michelle Cox (NAVFACSW)	4.5.1.1 Island Night Lizard – Federally Threatened, Management Strategy IV. Support studies to investigate the effectiveness of island night lizard management strategies. A. Support scientific studies of competition relationships between alligator lizards and island night lizards. Comment: Add B – Support genetic studies of isolated island night lizard populations to determine population structure and size.	Yes (MZ)	Text revised as follows: "IV. B. Support genetic studies of isolated island night lizard populations to determine population structure and size."
48.	4-73	1			Michelle Cox (NAVFACSW) and Valerie Vartanian (NAVFACSW)	4.6 Invasive Exotic Species, Current Management This non-native plant control effort focused primarily on fennel and short-pod mustard, although several other target non-native species were treated in 2008, including: arundo, agave, cliff aster, smilo grass, and milk thistle (Agri Chemical and Supply Inc. 2009). Comment: Short-podded (not pod). Change throughout the document.	Yes (MZ)	Text revised per comment and short pod mustard changed to short-podded mustard throughout the document.
49.	4-73	1			Michelle Cox (NAVFACSW) and Valerie Vartanian (NAVFACSW)	4.6 Invasive Exotic Species, Current Management Add: In 2010, Sahara mustard was mapped and treated.	Yes (MZ)	Discussion revised as follows: "This non-native plant control effort focused primarily on fennel and short-podded mustard, although several other target non-native species were treated in 2008, including: arundo, agave, cliff aster, smilo grass, and milk thistle (Agri Chemical and Supply Inc. 2009). Beginning in 2010, Sahara mustard was also mapped and treated (V. Vartanian, pers. comm., 2010)."

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50.	4-74	2nd bullet			Michelle Cox (NAVFACSW) and Valerie Vartanian (NAVFACSW)	4.6.1 Terrestrial Invasive Exotic Species, Specific Concerns Established populations of invasive exotic terrestrial plants are present in SNI, which include fennel, short-pod mustard, arundo, agave, cliff aster, smilo grass, and milk thistle. Comment: Change to short-podded, delete agave, and add Sahara mustard.	Yes (MZ)	Text revised as follows: "Established populations of invasive exotic terrestrial plants are present in SNI, which include fennel, short-podded mustard, Sahara mustard, arundo, cliff aster, smilo grass, and milk thistle."
51.	4-75	1st Paragraph on Pg 4-75			Edmund Pert (CDFG South Coast Region)	4.6.1 Terrestrial Invasive Exotic Species, Current Management "Implementation of the feral cat control and removal program was accomplished from 2009-2010. A majority of the feral cats at SNI have been removed as a result of that program. Monitoring for feral cats using remote video and trapping at SNI continues to remain a priority management action." Comment: Given that additional feral cats may be detected and trapping may resume, Section 4.6.1 should discuss the measures that will be implemented to minimize impacts to incidentally captured island foxes including: • The trap checking protocol that will be used in order to prevent trap transmitter system failures and associated injuries to island foxes. • Minimizing the risk of hypothermia and hyperthermia to island foxes by closing traps during extreme weather conditions (Santa Ana winds, rain, and when the ambient temperature is below 40 degrees F or above 80 degrees F) and relocating traps at which incidentally captured island foxes were hypothermic and hyperthermic. • Not opening traps before July 1 to minimize impacts to lactating females and their pups. • Plans to immediately notify CDFG Region 5 staff of island fox injuries associated with the feral cat removal project, so that CDFG has the opportunity to assist in developing additional methods to reduce island fox injuries, which even if treated could decrease the reproductive potential of the injured individuals due to a reduction of their ability to hunt and provide food for dependent young. The Working Group discussed at the Draft Final INRMP Document Review Meeting 21 OCT 2010 that the INRMP includes management strategies that are more general rather than specific and agreed that the comment will be addressed by crafting additional general language to respond to the intent of the comment.	Yes (MZ)	Refer to Michelle Cox (NAVFACSW), Valerie Vartanian (NAVFACSW), Martin Ruane (NBVC), Grace Smith (NAVAIR), and John Ugoretz (NAVAIR) comments for recommend changes to implement CDFG South Coast Region comments.

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52.	4-75	1st Paragraph on Pg 4-75	Last		Michelle Cox (NAVFACSW), Valerie Vartanian (NAVFACSW), Martin Ruane (NBVC), Grace Smith (NAVAIR), and John Ugoretz (NAVAIR)	4.6.1 Terrestrial Invasive Exotic Species, Current Management "Implementation of the feral cat control and removal program was accomplished from 2009-2010. A majority of the feral cats at SNI have been removed as a result of that program. Monitoring for feral cats using remote video and trapping at SNI continues to remain a priority management action." Comment: Add at end of paragraph … "If additional feral cats are detected, trapping may again be required. Any feral cat trapping efforts would follow the same protocols described in the environmental assessment for the seabird restoration project (USFWS 2009), as well as other protocols and methods that were later incorporated into the project to reduce potential impacts to sensitive species. If non-native animal trapping occurs in the future, targeting feral animals such as cats, the Navy will coordinate with CDFG (South Coast Region) and USFWS to determine and discuss any appropriate measures to reduce any adverse impacts to island foxes."	Yes (MZ)	Paragraph revised as follows: "Management for the control and removal of non native terrestrial mammals on SNI was identified as a recommended management action in the 2006-2010 SNI INRMP for the protection and restoration of seabirds and other native wildlife on SNI and was endorsed by the Trustee Council for the Montrose Settlements Restoration Program (MSRP) (USFWS 2009). The Trustee Council for the MSRP selected the restoration of seabirds on SNI through the complete removal of feral cats as a priority project in their MSRP Final Restoration Plan. Implementation of the feral cat control and removal program was accomplished from 2009-2010. A majority of the feral cats at SNI have been removed as a result of that program. Monitoring for feral cats using remote video and trapping at SNI continues to remain a priority management action. If additional feral cats are detected, trapping may again be required. Any feral cat trapping efforts would follow the same protocols described in the environmental assessment for the seabird restoration project (USFWS 2009), as well as other protocols and methods that were later incorporated into the project to reduce potential impacts to sensitive species. If non-native animal trapping occurs in the future, targeting feral animals such as cats, the Navy will coordinate with CDFG (South Coast Region) and USFWS to determine and discuss any appropriate measures to reduce any adverse impacts to island foxes."

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53.	4-75	1st Objective on Pg 4-75			Michelle Cox (NAVFACSW) and Valerie Vartanian (NAVFACSW)	4.6.1 Terrestrial Invasive Exotic Species, Management Strategy Objective: Minimize introduction of invasive non-native terrestrial species to San Nicolas Island. Comment: Change objective to – "Minimize introduction of invasive non-native terrestrial species to San Nicolas Island through prevention."	Yes (MZ)	Objective revised per comment.
54.	4-75	Replace I			Michelle Cox (NAVFACSW) and Valerie Vartanian (NAVFACSW)	4.6.1 Terrestrial Invasive Exotic Species, Management Strategy Change I, II, III to I.A, I.B, I.C. Add I.D. Inspect barge and aircraft before they leave the mainland. For transport arriving directly from other ports or airports, inspect prior to disembarking on SNI.	Yes (MZ)	Text revised as follows: I .Prepare and implement a bio-security plan to prevent non-natives from entering SNI. I.A. Enforce requirement that vehicles and equipment be cleaned prior to shipment to the island, and between uses at different island construction sites. I.B. Gravel and fill materials are brought to the island, then documentation is required to certify that it is "weed free." Inspections of the material will be conducted to verify this requirement. I.C. Require that native plant species be used for landscaping unless a species is specifically approved by ED. I.D. Inspect barge and aircraft before they leave the mainland. For transport arriving directly from other ports or airports, inspect prior to disembarking on SNI.
55.	4-75	Replace I			Michelle Cox (NAVFACSW) and Valerie Vartanian (NAVFACSW)	4.6.1 Terrestrial Invasive Exotic Species, Management Strategy Strategy I is: "Prepare and implement a bio-security plan to prevent non-natives from entering SNI."	Yes (MZ)	Strategy I revised per comment.
56.	4-75	Add II			Michelle Cox (NAVFACSW) and Valerie Vartanian (NAVFACSW)	4.6.1 Terrestrial Invasive Exotic Species, Management Strategy Strategy II is: "Prepare educational materials for the SNI military and civilian employees, contractors, and other visitors to prevent the introduction of non-native terrestrial species."	Yes (MZ)	Strategy II revised per comment.

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57.	4-75	2nd Objective on Pg. 4-75 and 1st Objective on Pg 4-76			Michelle Cox (NAVFACSW) and Valerie Vartanian (NAVFACSW)	4.6.1 Terrestrial Invasive Exotic Species, Management Strategy Objective "Enhance existing capability to conduct planning for early detection and rapid response." Objective "Enhance current monitoring efforts for early detection of invasive non-native species" Comment: Combine for new 2nd Objective – "Enhance current early detection and rapid response management capabilities."	Yes (MZ)	Objective revised per comment.
58.	4-75	3rd Objective on Pg 4-75			Michelle Cox (NAVFACSW) and Valerie Vartanian (NAVFACSW)	4.6.1 Terrestrial Invasive Exotic Species, Management Strategy Objective: Develop information and education materials for pest control and island personnel. Comment: Delete objective.	Yes (MZ)	Objective deleted per comment.
59.	4-75	New 2nd Objective on Pg 4-75 Mgmt Strategy			Michelle Cox (NAVFACSW) and Valerie Vartanian (NAVFACSW)	4.6.1 Terrestrial Invasive Exotic Species, Management Strategy Comment: Add strategy to 2nd objective: Objective: Enhance current early detection and rapid response management capabilities. "III. Ensure bio-security plan establishes early detection protocol and rapid response options."	Yes (MZ)	Text revised per comment.
60.	4-75	New 2nd Objective on Pg 4-75			Michelle Cox (NAVFACSW) and Valerie Vartanian (NAVFACSW)	4.6.1 Terrestrial Invasive Exotic Species, Management Strategy Comment: Add to above Biosecurity strategy "III. Ensure bio-security plan establishes early detection protocol and rapid response options. III. A. Establishing adequate monitoring locations to detect invasive species introduction and spread. III. B. Develop a communication network as a rapid response tool to quarantine specific invaders and identify the pathway. III. C. Support rapid response by determining funding sources, contract vehicles, and cooperative mechanisms that can be accessed quickly. III. D. Prepare Instructions that includes measures to prevent the introduction of invasive non-native species, detect early and respond rapidly to new introductions, and control and monitor established populations."	Yes (MZ)	Strategies added per comment.
61.	4-75	2nd Objective on Pg 4-75			Michelle Cox (NAVFACSW) and Valerie Vartanian (NAVFACSW)	4.6.1 Terrestrial Invasive Exotic Species, Management Strategy Comment: Add strategy to 2nd Objective: Objective: Enhance current early detection and rapid response management capabilities. IV. Prepare educational materials for the SNI military and civilian employees, contractors, and other visitors as a tool in early detection of non-native terrestrial species.	Yes (MZ)	Strategy added per comment.

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62.	4-76	IV			Michelle Cox (NAVFACSW) and Valerie Vartanian (NAVFACSW)	4.6.1 Terrestrial Invasive Exotic Species, Management Strategy IV. Prepare a bio-security plan, to prevent non-natives from entering island by putting procedures in place to search or monitor barge and aircraft before they leave the mainland. Encourage early detection and rapid response contingency planning including provisions for communications, response funding, cooperative mechanisms and other relevant issues focused on reducing the introduction of invasive non-native species at SNI. Comment: Delete Strategy IV. Prepare a biosecurity plan, to prevent…..	Yes (MZ)	Strategy deleted per comment.
63.	4-76	V			Michelle Cox (NAVFACSW) and Valerie Vartanian (NAVFACSW)	4.6.1 Terrestrial Invasive Exotic Species, Management Strategy Objective: Evaluate control and management capabilities for established invasive non-native species populations and identify strategic gaps. V. Complete an invasive non-native plant species management plan. Comment: Change to "Revise and implement an invasive plant management plan based on current needs, information, and priorities."	Yes (MZ)	Strategy revised per comment.
64.	4-76	VI			Michelle Cox (NAVFACSW) and Valerie Vartanian (NAVFACSW)	4.6.1 Terrestrial Invasive Exotic Species, Management Strategy Objective: Evaluate control and management capabilities for established invasive non-native species populations and identify strategic gaps. VI. Revise and update the invasive non-native species control plan based on current needs, information, and priorities. Comment: Delete VI and replace with the following "Increase detection rates and management efficacy by monitoring the presence and absence of invasive non-native species populations."	Yes (MZ)	Strategy revised per comment.
65.	4-76	VII			Michelle Cox (NAVFACSW) and Valerie Vartanian (NAVFACSW)	4.6.1 Terrestrial Invasive Exotic Species, Management Strategy Objective: Evaluate control and management capabilities for established invasive non-native species populations and identify strategic gaps. VII. Map and prioritize most problematic terrestrial invasive non-native species populations. Comment: Delete "most problematic"	Yes (MZ)	Text revised as follows: "VII. Map and prioritize terrestrial invasive non-native species populations."
66.	4-76	VII.A			Michelle Cox (NAVFACSW) and Valerie Vartanian (NAVFACSW)	4.6.1 Terrestrial Invasive Exotic Species, Management Strategy Objective: Evaluate control and management capabilities for established invasive non-native species populations and identify strategic gaps. VII. A. Map the distribution of invasive non-native weeds, and those that have the potential to become invasive, every five years. Comment: Change to "Map the distribution of invasive species every five years."	Yes (MZ)	Text revised as follows: "VII. A. Map the distribution of invasive species every five years."

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67.	4-76	2nd Objective on Pg 4-76			Michelle Cox (NAVFACSW) and Valerie Vartanian (NAVFACSW)	4.6.1 Terrestrial Invasive Exotic Species, Management Strategy Objective: Evaluate control and management capabilities for established invasive non-native species populations and identify strategic gaps. Comment: Add Strategy to the following objective: Strategy. Address non-native species in NEPA and other ground disturbing project plans. A. Ensure funding is secured for non-native removal during all phases (including post-project), if applicable. B. Monitor projects to ensure personnel are following BMPs, conservation measures, and other guidelines and requirements.	Yes (MZ)	Strategy added per comment.
68.	4-76	3rd Objective on Pg 4-76			Michelle Cox (NAVFACSW) and Valerie Vartanian (NAVFACSW)	4.6.1 Terrestrial Invasive Exotic Species, Management Strategy Objective: Manage roads, access routes, and new construction sites to minimize the spread of invasive non-native species and insure that new road or access routes are not created without authorization and project review approval. Comment: Change objective to a strategy under the following objective: Objective: "Evaluate control and management capabilities for established invasive non-native species populations and identify strategic gaps. Strategy: Manage roads, access routes, and new construction sites to minimize the spread of invasive non-native species and insure that new road or access routes are not created without authorization and project review approval.	Yes (MZ)	Text revised per comment as follows: Objective: Evaluate control and management capabilities for established invasive non-native species populations and identify strategic gaps. XI. Manage roads, access routes, and new construction sites to minimize the spread of invasive non-native species and insure that new road or access routes are not created without authorization and project review approval.

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69.	4-76	X			Michelle Cox (NAVFACSW) and Valerie Vartanian (NAVFACSW)	4.6.1 Terrestrial Invasive Exotic Species, Management Strategy X. Designate and maintain roads and access routes. Comment: Change X to "Develop and implement Island Long-Term Road Maintenance Plan." Comment: Change "X. Designate and maintain roads and access routes" to X.A, Change "XI. Require that maintenance or repair of existing roads stay within established footprints." to X.B, Change "XII. Clean roadside mowing equipment of adhering dirt and vegetation between mowing cycles" to X.C. Change "XIII. Schedule roadside mowing to minimize weedy species seed distribution" to X.D.	Yes (MZ)	Text revised per comment as follows: Objective: Evaluate control and management capabilities for established invasive non-native species populations and identify strategic gaps. XI. Manage roads, access routes, and new construction sites to minimize the spread of invasive non-native species and insure that new road or access routes are not created without authorization and project review approval. A. Develop and implement Island Long-Term Road Maintenance Plan. B. Require that maintenance or repair of existing roads stay within established footprints. C. Clean roadside mowing equipment of adhering dirt and vegetation between mowing cycles. D. Schedule roadside mowing to minimize weedy species seed distribution.
70.	4-76	Last Objective on Page 4-76			Michelle Cox (NAVFACSW) and Valerie Vartanian (NAVFACSW)	4.6.1 Terrestrial Invasive Exotic Species, Management Strategy Objective: Remove high priority invasive non-native species and continue to evaluate the necessity for removal of other species. Comment: Replace objective with "Apply adaptive management principles and continue to evaluate the necessity for removal of other species."	Yes (MZ)	Text revised as follows: "Objective: Apply adaptive management principles and continue to evaluate the necessity for removal of other species."
71.	4-76 to 4-77	XIV			Michelle Cox (NAVFACSW) and Valerie Vartanian (NAVFACSW)	4.6.1 Terrestrial Invasive Exotic Species, Management Strategy XIV. Expand the current weedy species removal program. XIV. A. Support the tamarisk removal/spring enhancement efforts on SNI. Comment: Delete XIV and XIV A.	Yes (MZ)	Strategies deleted per comment.

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72.	4-77	XVI			Michelle Cox (NAVFACSW)	4.6.1 Terrestrial Invasive Exotic Species, Management Strategy XVI. Complete the removal of the feral cat population on SNI. Assess and monitor the progress and success of the removal of feral cats. XVI. A. Survey and inventory the current status of species known to be impacted by feral cats to properly assess the recovery of those species upon the completion of the project. XVI. B. Continue post removal monitoring of key prey species (mice) to document recovery of potentially impacted species. Comment: Modify this strategy based on Edmund Pert (CDFG South Coast Region) comments and Michelle Cox (NAVFACSW), Valerie Vartanian (NAVFACSW), Martin Ruane (NBVC), Grace Smith (NAVAIR), and John Ugoretz (NAVAIR) comments.	Yes (MZ)	Refer to Valerie Vartanian (NAVFACSW) comment (see below) for recommended changes to implement Michelle Cox (NAVFACSW) comments regarding this topic.
73.	4-77	XVI.B			Valerie Vartanian (NAVFACSW)	4.6.1 Terrestrial Invasive Exotic Species, Management Strategy XVI. B. Continue post removal monitoring of key prey species (mice) to document recovery of potentially impacted species. Comment: I'm not sure that this item is needed – XVI.B. – This strategy seems redundant and out of context. Delete.	Yes (MZ)	Strategy delete per comment.
74.	4-77	1st Objective on Pg 4-77			Michelle Cox (NAVFACSW) and Valerie Vartanian (NAVFACSW)	4.6.1 Terrestrial Invasive Exotic Species, Management Strategy Objective: Address invasive non-native species concerns in planning for restoration projects or other ground disturbing activities in SNI land and water management field and guidance manuals. Comment: Delete Objective.	Yes (MZ)	Objective deleted per comment.
75.	4-77	XVII and XVIII			Michelle Cox (NAVFACSW) and Valerie Vartanian (NAVFACSW)	4.6.1 Terrestrial Invasive Exotic Species, Management Strategy XVII. Make project proponents pay for restoration projects that are used to compensate for development of habitat. XVIII. Check project to make sure personnel are following guidelines. Comment: Move XVII and XVIII strategies to support the following objective: Objective: Evaluate control and management capabilities for established invasive non-native species populations and identify strategic gaps.	Yes (MZ)	Strategies moved per comment as follows: Objective: Evaluate control and management capabilities for established invasive non-native species populations and identify strategic gaps. XII. Make project proponents pay for restoration projects that are used to compensate for development of habitat. XIII. Check project to make sure personnel are following guidelines.

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76.	4-77	2nd Objective on Pg 4-77			Michelle Cox (NAVFACSW) and Valerie Vartanian (NAVFACSW)	4.6.1 Terrestrial Invasive Exotic Species, Management Strategy Objective: Prepare an Instruction that includes considerations to prevent invasive non-native species from arriving on San Nicolas Island, to detect early and respond rapidly to the arrival of an invasive non-native species, and control those invasive non-native species once they have established local populations on San Nicolas Island. Comment: Change to a strategy to support the following objective "Apply adaptive management principles and continue to evaluate the necessity for removal of other species." Comment: Revise language as follows "Prepare an Instruction to support an adaptive management approach for terrestrial invasive exotic species management."	Yes (MZ)	Text revised as follows per comment: Objective: Apply adaptive management principles and continue to evaluate the necessity for removal of other species. XVI. Prepare an Instruction to support an adaptive management approach for terrestrial invasive exotic species management
77.	4-79	1st and 2nd Objective on Pg 4-79			Michelle Cox (NAVFACSW) and Valerie Vartanian (NAVFACSW)	4.6.2 Aquatic Invasive Species, Management Strategy Objective: Prevent and control invasive non-native species invasions to minimize disruption of San Nicolas Island's marine ecosystem and continue to improve prevention, early detection and rapid response, control and management, restoration, and organizational collaboration through an adaptive management approach. Objective: Minimize the harmful ecological, economic, and human health impacts of aquatic invasive species in SNI waters. Comment: Change 1st Objective to … "Prevent and manage invasive non-native invasions to minimize harmful ecological, economic, and human health impacts of aquatic invasive species in SNI waters." Comment: Delete 2nd Objective.	Yes (MZ)	Objective revised as follows: "Prevent and manage invasive non-native invasions to minimize harmful ecological, economic, and human health impacts of aquatic invasive species in SNI waters."
78.	4-79	I			Michelle Cox (NAVFACSW) and Valerie Vartanian (NAVFACSW)	4.6.2 Aquatic Invasive Species, Management Strategy I. Prevent the introduction of invasive non-native marine and coastal species into California waters, is a first priority for control. Comment: Delete "is a first priority for control."	Yes (MZ)	Strategy revised as follows: "I. Prevent the introduction of invasive non-native marine and coastal species into California waters."
79.	4-80	II			Michelle Cox (NAVFACSW) and Valerie Vartanian (NAVFACSW)	4.6.2 Aquatic Invasive Species, Management Strategy II. Develop a standardized monitoring system focused on early detection for high priority aquatic invasive species. Comment: Add after early detection … "and rapid response."	Yes (MZ)	Strategy revised as follows: "II. Develop a standardized monitoring system focused on early detection and rapid response for high priority aquatic invasive species."
80.	4-81				Michelle Cox (NAVFACSW) and Valerie Vartanian (NAVFACSW)	4.7.1 BASH Program, Management Strategy Comment: Add the following sidebar discussion next to Objectives and Strategies for BASH and Wildlife Hazard Assessment I – III. "For more information regarding Migratory Bird Management refer to Section 4.4.3 Birds."	Yes (MZ)	Sidebar discussion added to section per comment.

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81.	4-81	2nd Objective on Pg 4-81			Michelle Cox (NAVFACSW) and Valerie Vartanian (NAVFACSW)	4.7.1 BASH Program, Management Strategy 1st Objective: Reduce the potential for bird and other animal collisions with aircraft at the SNI airfield. 2nd Objective: Create and formalize a Wildlife Hazard Assessment and Bird Aircraft Strike Hazard Plan. Comment: Change 2nd Objective "Create and formalize a Wildlife Hazard Assessment and Bird Aircraft Strike Hazard Plan" to a strategy that will support 1st Objective "Reduce the potential for bird and other animal collisions with aircraft at the SNI airfield." Comment: Change "Create and formalize a Wildlife Hazard Assessment and Bird Aircraft Strike Hazard Plan" to "Develop and implement a Wildlife Hazard Assessment Bird Aircraft Strike Hazard Plan."	Yes (MZ)	Text revised as follows: Objective: Reduce the potential for bird and other animal collisions with aircraft at the SNI airfield. I. Develop and implement a Wildlife Hazard Assessment Bird Aircraft Strike Hazard Plan.
82.	4-81	III			Michelle Cox (NAVFACSW) and Valerie Vartanian (NAVFACSW)	4.7.1 BASH Program III. Revise the BASH plan for SNI and continue to formalize for implementation. Comment: Delete III.	Yes (MZ)	Strategy deleted per comment.
83.	4-81	Current Management			Michelle Cox (NAVFACSW) and Valerie Vartanian (NAVFACSW)	4.7.2 Pest/Predator Control, Current Management Comment: Add definition of "Pest" after first sentence in the first paragraph in Current Management on Page 4-81. "A pest is a domestic plant or animal (including insects) usually found in the urban (built) environment that if it escapes causes harm to humans or native ecosystems (this is my suggested definition combined from various generic definitions of pest)."	Yes (MZ)	Paragraph revised as follows: "San Nicolas Island does not have a current Integrated Pest Management Plan (IPMP). For the purposes of this INRMP, a pest is defined as a domestic plant or animal (including insects) usually found in the urban (built) environment that if it escapes causes harm to humans or native ecosystems (V. Vartanian, pers. comm., 2010). Actions are being taken to modify the IPMP for Point Mugu and Port Hueneme to include SNI in that plan's footprint. The installation should complete a Bio-Security Plan which is currently under development at the time of writing."
84.	4-82	1st Objective on Pg 4-82			Michelle Cox (NAVFACSW) and Valerie Vartanian (NAVFACSW)	4.7.2 Pest/Predator Control, Management Strategy Objective: Removal all non-native predators from San Nicolas Island and prevent new introductions. Comment: Revise as follows: "Prevent the introduction of pests to the island."	Yes (MZ)	Text revised as follows: "Objective: Prevent the introduction of pests to the island."

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85.	4-82	2nd and 3rd Objective on Pg 4-82			Michelle Cox (NAVFACSW) and Valerie Vartanian (NAVFACSW)	4.7.2 Pest/Predator Control, Management Strategy Objective: Control native species to minimize resource conflicts. Objective: Maintain rodent control in developed facilities. Comment: Combine objectives as follows: "Control pests around facilities while avoiding and minimizing impacts to non-target individuals."	Yes (MZ)	Text revised as follows: "Objective: Control pests around facilities while avoiding and minimizing impacts to non-target individuals."
86.	4-82	New 2nd Objective			Michelle Cox (NAVFACSW) and Valerie Vartanian (NAVFACSW)	4.7.2 Pest/Predator Control, Management Strategy Objective: Control pests around facilities while avoiding and minimizing impacts to non-target individuals. Comment: Add strategy to support this objective: "Develop pest control plan using IPMP guidelines for level of control based for the pest problems appropriate level of control."	Yes (MZ)	Text revised as follows: "Objective: Control pests around facilities while avoiding and minimizing impacts to non-target individuals. IV. Develop pest control plan using IPMP guidelines for level of control based for the pest problems appropriate level of control."
87.	4-82	II			Michelle Cox (NAVFACSW) and Valerie Vartanian (NAVFACSW)	4.7.2 Pest/Predator Control, Management Strategy II. Develop a rodent control/removal plan and implement if introduced species are detected. Comment: Change to "Develop a rodent control/removal plan and implement."	Yes (MZ)	Text revised as follows: "Objective: Control pests around facilities while avoiding and minimizing impacts to non-target individuals. II. Develop a rodent control/removal plan and implement."
88.	4-84	1st Objective on Pg 4-84			Michelle Cox (NAVFACSW)	4.8 Data Integration, Access, and Reporting Objective: Ensure the most effective integration, analysis, and dissemination of monitoring, research, and GIS information on San Nicolas Island and communication of this information to all concerned, so resources are managed effectively. Objective: Ensure the technically sound, practical and appropriate use of library and computer technology to organize, analyze, and communicate natural resource information in support of management decisions. Comment: Delete 1st Objective	Yes (MZ)	Objective deleted per comment.
89.	Ch 5				Mark Zegler (TDI)	5.0 Sustainability and Compatible Use at San Nicolas Island Comment: Ensure that management recommendations are referred to as "Objectives and Strategies" throughout the Chapter.	Yes (MZ)	Chapter reviewed to ensure that management recommendations are consistently referred to as "objectives" and "strategies."

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90.	5-13	Fourth Paragraph			Michelle Cox (NAVFACSW) and Valerie Vartanian (NAVFACSW)	5.1.3 Sustainability in the Built Environment – Current Management Comment: Sustainable Sites Initiative (SSI) is not spelled out the first time the acronym is used or at least the search couldn't find it. Ensure that SSI is identified the first time it is used.	Yes (MZ)	Text revised as follows: "While standards exist for sustainable structures - "green buildings" and "water management" - there are no comprehensive guidelines and performance benchmarks for those who want to create and measure sustainable landscapes in the built environment (SSI 2010). The Sustainable Sites Initiative (SSI) is an interdisciplinary effort by the American Society of Landscape Architects, the Lady Bird Johnson Wildflower Center at the University of Texas at Austin and the U.S. Botanic Garden to create voluntary national guidelines and performance benchmarks for sustainable land design, construction, and maintenance practices (SSI 2010)."
91.	5-15	I.A			Valerie Vartanian (NAVFACSW)	5.1.3 Sustainability in the Built Environment, Management Strategy I.A. Balance short-term mission accomplishments with long-term environmental, social, and economic assets that sustain the mission in the long term. Comment: Delete I.A.	Yes (MZ)	Strategy deleted per comment.
92.	5-22	1st Bullet			Michelle Cox (NAVFACSW)	5.3 Communications Towers, Wind Farms, and Power Lines, Specific Concerns There is concern about growing impacts from communications towers, power lines, and wind farms to migratory birds protected under the MBTA of 1918, as amended. Communications towers may kill from 4-50 million birds per year. Collisions with power transmission and distribution lines may kill anywhere from hundreds of thousands to 175 million birds annually. More than 15,000 wind turbines may kill 40,000 or more birds annually nationwide, the majority in California (Manville 2005). Comment: Replace "Communications towers may kill from 4-50 million birds per year." with "Communications towers may kill from 4-5 million birds per year."	Yes (MZ)	Text revised as follows: "Communication towers may kill from 4-5 million birds per year."

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93.	5-22	1st Bullet			Michelle Cox (NAVFACSW)	5.3 Communications Towers, Wind Farms, and Power Lines, Specific Concerns There is concern about growing impacts from communications towers, power lines, and wind farms to migratory birds protected under the MBTA of 1918, as amended. Communications towers may kill from 4-50 million birds per year. Collisions with power transmission and distribution lines may kill anywhere from hundreds of thousands to 175 million birds annually. More than 15,000 wind turbines may kill 40,000 or more birds annually nationwide, the majority in California (Manville 2005). Comment: Delete last sentence replace with: The avian risk assessment study for the SNI Wind Energy Project EA (NAVFACSW 2010b) estimated 20.13 avian fatalities, including 0.07 raptors per year for the 11 proposed wind turbines.	Yes (MZ)	Specific concern revised as follows: "There is concern about growing impacts from communications towers, power lines, and wind farms to migratory birds protected under the MBTA of 1918, as amended. Communication towers may kill from 4-5 million birds per year. Collisions with power transmission and distribution lines may kill anywhere from hundreds of thousands to 175 million birds annually, and power lines electrocute tens to hundreds of thousands more birds annually. The avian risk assessment study for the SNI Wind Energy Project EA (NAVFACSW 2010b) estimated 20.13 avian fatalities, including 0.07 raptors per year for the 11 proposed wind turbines."

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94.	5-23	Current Management Paragraph			Michelle Cox (NAVFACSW)	5.3 Communications Towers, Wind Farms, and Power Lines, Current Management Guidance on wind energy facilities from the California Energy Commission (CEC) and the CDFG such as the "California Guidelines for Reducing Impacts to Birds and Bats from Wind Energy Development" will also be used to manage these renewable energy facilities (CEC and CDFG 2007). Comment: Revise discussion as follows - "The conservation, avoidance, and minimization measures outlined in the SNI Wind Energy Project B.O. (USFWS 2010) and Wind Energy Project E.A. (NAVFACSW 2010b) will be followed for the proposed wind energy project on Skyline Drive. Guidance on wind energy facilities from the California Energy Commission (CEC) and the CDFG such as the "California Guidelines for Reducing Impacts to Birds and Bats from Wind Energy Development" (CEC and CDFG 2007) was referenced in the SNI Wind Energy Project B.O. and the Wind Energy Project E.A."	Yes (MZ)	Current management paragraph revised as follows: "Impacts associated with communications towers, wind energy facilities, and power lines are generally avoided and minimized through the Project Review Board and the Site Approval and Project Review Process (NBVCINST 11010.1). Guidance on communications towers from the USFWS such as the "Service Guidance on the Siting, Construction, Operation, and Decommissioning of Communications Towers" will also be used to manage these towers (USFWS 2000). The conservation, avoidance, and minimization measures outlined in the SNI Wind Energy Project B.O. (USFWS 2010) and Wind Energy Project E.A. (NAVFACSW 2010b) will be followed for the proposed wind energy project on Skyline Drive. Guidance on wind energy facilities from the California Energy Commission (CEC) and the CDFG such as the "California Guidelines for Reducing Impacts to Birds and Bats from Wind Energy Development" (CEC and CDFG 2007) was referenced in the SNI Wind Energy Project B.O. and the Wind Energy Project E.A."

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95.	5-23	Mgmt Strategy II			Michelle Cox (NAVFACSW)	5.3 Communications Towers, Wind Farms, and Power Lines, Management Strategy II. Use established protocols to evaluate and rank potential sites proposed for wind development. A. Avoid siting turbines in major bird migration corridors or in areas where birds are highly concentrated. B. Avoid placing turbines in areas that attract raptors; specifically, consider setbacks from cliff/rim edges, avoid dips or passes along ridges, and avoid turbine sites in or near ground squirrel colonies. C. Avoid attracting high densities of prey animals consumed by raptors, reduce carrion availability, and avoid creating wetlands adjacent to turbines; D. Where rotor swept area is a risk to wildlife, adjust turbine tower height where feasible to reduce or eliminate the risk from turbine strikes. E. Avoid siting turbines near bat hibernation and breeding colonies, migration corridors, and in flight paths. F. Avoid siting turbines in areas with ESA-listed plants, animals, and designated critical habitat. G. As practical, use less impactive turbine design and operation Comment: Keep Strategy II but delete A-G.	Yes (MZ)	Strategy II. A through II. G deleted. Text revised as follows: "II. Use established protocols to evaluate and rank potential sites proposed for wind development."
96.	5-23	Mgmt Strategy II			Michelle Cox (NAVFACSW)	5.3 Communications Towers, Wind Farms, and Power Lines, Management Strategy II. Use established protocols to evaluate and rank potential sites proposed for wind development. Comment: Add who developed the protocol … "Use established protocols…."	Yes (MZ)	Refer to Martin Ruane (NBVC) comment (see below) for recommended changes to implement Michelle Cox (NAVFACSW) comments regarding this topic.
97.	5-23	Mgmt Strategy II			Martin Ruane (NBVC)	5.3 Communications Towers, Wind Farms, and Power Lines, Management Strategy II. Use established protocols to evaluate and rank potential sites proposed for wind development. Comment: The majority of the guidelines address where to select wind farms across landscapes. NBVC was tied to SNI and with that only two spots that were not impacting NAVAIR and airfield constraints, and the alternative site included natural and cultural resources. This meant that there were few options. The two protocols that you can find online and cite are: CA guidelines for reducing impacts to birds and bats from wind energy development (from the state); USFWS interim guidance on avoiding and minimizing wildlife impacts from wind turbines (from the federal government).	Yes (MZ)	Text revised as follows: "II. Use established protocols, such as the Service Interim Guidance on Avoiding and Minimizing Wildlife Impacts from Wind Turbines (USFWS 2003b) and the California Guidelines for Reducing Impacts to Birds and Bats from Wind Energy Development (CEC and CDFG 2007), to evaluate and rank potential sites proposed for wind development.

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98.	5-24	Mgmt Strategy III			Michelle Cox (NAVFACSW)	5.3 Communications Towers, Wind Farms, and Power Lines, Management Strategy III. Comply with California Energy Commission and CDFG guidelines for reducing impacts to birds and bats from wind energy development (CEC and CDFG 2007). Comment: Add to the end of III "…to the greatest extent possible."	Yes (MZ)	Text revised as follows: "III. Comply with California Energy Commission and CDFG guidelines for reducing impacts to birds and bats from wind energy development to the greatest extent possible (CEC and CDFG 2007)."
99.	5-25 to 5-26	Mgmt Strategy V			Michelle Cox (NAVFACSW)	5.3 Communications Towers, Wind Farms, and Power Lines, Management Strategy V. Comply with USFWS guidelines for reducing fatal bird strikes on communication towers (USFWS 2000) to the greatest extent practicable. Mgmt Strategy V.A – V. L Comment: Keep Strategy V but delete A-L.	Yes (MZ)	Strategy revised as follows: "V. Comply with USFWS guidelines for reducing fatal bird strikes on communication towers (USFWS 2000) to the greatest extent practicable."
100.	5-34	1st and 2nd Objective on Pg 5-34			Michelle Cox (NAVFACSW)	5.7.1 Consistency with Integrated Cultural Resource Management Plan, Current Management Objective: Coordinate any potential natural resource management activity that may impact sensitive cultural resources with the cultural resource program. Objective: Coordinate management activities between the cultural and natural resource management program when a natural resource impacts a cultural resource. Comment: Delete the 1st objective. Comment: Revise 2nd objective "Coordinate management activities between the cultural and natural resource management program when a natural resource impacts, or has the potential to impact, a cultural resource."	Yes (MZ)	Objective revised as follows: "Coordinate management activities between the cultural and natural resource management program when a natural resource impacts, or has the potential to impact, a cultural resource."
101.	5-53	1st and 2nd Objective on Pg 5-53			Michelle Cox (NAVFACSW)	5.12.1 Shoreline Construction, Management Strategy Objective: Seek improved habitat value of developed shorelines and marine structures and their functional contribution to the ecosystem. Objective: Ensure that shoreline construction activities do not increase erosion or adversely impact sensitive natural and cultural resources. Comment: Delete 1st Objective	Yes (MZ)	1st Objective deleted. Objective for section 5.12.1 is as follows: "Ensure that shoreline construction activities do not increase erosion or adversely impact sensitive natural or cultural resources."
102.	5-58 to 5-63				Valerie Vartanian (NAVFACSW)	5.14 Landscaping and Grounds Maintenance Comment: Change all reference of "NBVC Landscape Master Plan" to "San Nicolas Island Landscaping Plant List."	Yes (MZ)	All reference to "NBVC Landscape Master Plan" changed to "San Nicolas Island Landscaping Plant List."
103.	5-59 to 5-60				Working Group Draft Final Doc. Review Mtg. (21 OCT 2010)	5.14 Landscaping and Grounds Maintenance, Current Management Comment: The Working Group discussed the fact that the landscaping list discussed in the "Current Management" section of 5.14 Landscaping and Grounds Maintenance was based on the NBVC Approved Plant List. This Approved Plant List was developed for Point Mugu and was not intended to be applicable for use on SNI. Members of the Working Group from NBVC Environmental Division agreed to review and revise 5.14 Landscaping and Grounds Maintenance in order to reflect the changes that will occur during the development of the new landscaping plat list for SNI.	Yes (MZ)	Refer to Valerie Vartanian (NAVFACSW) comments for recommend changes to implement Working Group comments.

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104.	5-59	1	5		Valerie Vartanian (NAVFACSW)	5.14 Landscaping and Grounds Maintenance, Current Management Future landscaping at SNI will follow the guidance set forth in the NBVC Smart Landscape Master Plan – Landscape Plant Selection Guide. Comment: Change to "Future landscaping at SNI will follow the guidelines set forth in the "San Nicolas Island Landscaping Plant List" (see Appendix F)."	Yes (MZ)	Paragraph revised as follows: "Maintenance of semi-developed and developed grounds is accomplished at SNI with technical assistance from staff in NBVC Environmental Division. Landscaping and grounds keeping work occurs primarily within the Community Support area at SNI. It is anticipated that future native plant landscaping will be developed to accompany facility renovations and improvement around the Community Support Area. Future landscaping at SNI will follow the guidelines set forth in the "San Nicolas Island Landscaping Plant List" (see Appendix F)."
105.	5-59	2	1		Valerie Vartanian (NAVFACSW)	5.14 Landscaping and Grounds Maintenance, Current Management The purpose of the NBVC Smart Landscape Master Plan – Landscape Plant Selection Guide is to provide procedures for base personnel to select appropriate plant stock that is not considered invasive at this time to this region. Comment: Change to "The purpose of the San Nicolas Island Landscaping Plant List is to provide a clear set of approved plants that are not known to be invasive to the island."	Yes (MZ)	Paragraph revised as follows: "The purpose of the San Nicolas Island Landscaping Plant List is to provide a clear set of approved plants that are not known to be invasive to the island. All plant selections (outdoor landscape or indoor plants) for SNI must be approved by appropriate staff in NBVC ED. Specifically, landscape designs and plant lists shall be reviewed and approved by the Installation Natural Resource Specialist and the NAVFAC Landscape Architect in the planning stages of project design."

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106.	5-59	2	2		Valerie Vartanian (NAVFACSW)	5.14 Landscaping and Grounds Maintenance, Current Management The NBVC Landscape Plant Selection Guide – Approved Plant List is the initial guideline for identifying the appropriate landscaping to be used at SNI; however, all plant selections (outdoor landscape or indoor plants) for SNI must be approved by appropriate staff in NBVC ED. Comment: Delete "The NBVC Landscape Plant Selection Guide – Approved Plant List is the initial guideline for identifying the appropriate landscaping to be used at SNI; however." Start sentence with "All plant selections …"	Yes (MZ)	Paragraph revised as follows: "The purpose of the San Nicolas Island Landscaping Plant List is to provide a clear set of approved plants that are not known to be invasive to the island. All plant selections (outdoor landscape or indoor plants) for SNI must be approved by appropriate staff in NBVC ED. Specifically, landscape designs and plant lists shall be reviewed and approved by the Installation Natural Resource Specialist and the NAVFAC Landscape Architect in the planning stages of project design."
107.	5-59	Last			Valerie Vartanian (NAVFACSW)	5.14 Landscaping and Grounds Maintenance, Current Management Comment: Delete "For each landscaping project, California native species from the NBVC Approved Plant List shall constitute 100 percent of the plant material within each stratum (herb, shrub, and tree). The determination of whether cultivars are considered native or exotic will be made on a project-by-project basis by the Installation Natural Resource Specialist and the NAVFAC Landscape Architect."	Yes (MZ)	Paragraph deleted per comment.
108.	5-60	1st Paragraph		Table 5-4	Valerie Vartanian (NAVFACSW)	5.14 Landscaping and Grounds Maintenance, Current Management Plants unacceptable for landscaping at SNI under any circumstances include all plants on the Cal-IPC Invasive Plant Inventory, all plants on the San Diego County Ornamental Invasives Plant Guide, and all non-native grasses. Invasive exotic plants that are unacceptable for landscaping under any circumstances at SNI are identified in Table 5-4. Table 5-4. Naval Base Ventura County Invasive Plant List Comment: Delete 1st paragraph and Table 5-4.	Yes (MZ)	Paragraph and Table deleted per comment.

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109.	5-60	Last Paragraph			Valerie Vartanian (NAVFACSW)	5.14 Landscaping and Grounds Maintenance, Assessment of Current Management Comment: Delete "Please note that not all species on the NBVC Smart Landscape Master Plan - Landscape Plant Selection Guide are appropriate for all settings. For example, in some areas trees may not be approved due to Bird/Animal Aircraft Strike Hazard risks and/or the presence of federally listed species. Additional native species may be included in the landscape design contingent upon the approval of the Installation Natural Resource Specialist and the NAVFAC Landscape Architect. All plants shall be verified for availability in size and quantities needed for each project prior to specifying on plans or scopes of work." Replace with … "Please note that other species may be used for landscaping but must be approved by Installation Natural Resource Specialist and the NAVFAC Landscape Architect prior to specifying on plans or scopes of work. These species must be screened through regional invasive plant lists. Only seed may be brought to the island at this time, no plants in soils. Contact Installation Natural Resource Specialist with any questions or requests for plants not on the approved list."	Yes (MZ)	Paragraph revised as follows: "It is vital that coordination with the Installation Natural Resource Specialist and the NAVFAC Landscape Architect occur early in the planning process to determine site-specific needs and constraints. Please note that other species may be used for landscaping but must be approved by Installation Natural Resource Specialist and the NAVFAC Landscape Architect prior to specifying on plans or scopes of work. These species must be screened through regional invasive plant lists. Only seed may be brought to the island at this time, no plants in soils. Contact Installation Natural Resource Specialist with any questions or requests for plants not on the approved San Nicolas Island Landscaping Plant List. This San Nicolas Island Landscaping Plant List is updated periodically. Prior to initiating a project, please obtain the most recent list from the Installation Natural Resource Specialist."
110.	5-61	Objective			Valerie Vartanian (NAVFACSW)	5.14 Landscaping and Grounds Maintenance, Management Strategy Objective: Improve the visual and aesthetic environment for both civilian and military personnel living, working, or visiting San Nicolas Island, while avoiding the introduction of invasive exotic species, decreasing water use, improving drought tolerance of plant communities, and maintaining the integrity and character of cultural resources. Comment: Change objective to "Sustainably improve the visual and aesthetic environment for both civilian and military personnel living, working, or visiting San Nicolas Island, while maintaining the integrity and character of cultural resources."	Yes (MZ)	Objective revised as follows: "Sustainably improve the visual and aesthetic environment for both civilian and military personnel living, working, or visiting San Nicolas Island, while maintaining the integrity and character of cultural resources."
111.	5-61	I			Valerie Vartanian (NAVFACSW)	5.14 Landscaping and Grounds Maintenance, Management Strategy I. Comply with environmental laws, Eos, and Navy policies by considering environmental factors in landscape planning. Comment: Change I. to "Comply with cultural and environmental laws, EOs, and Navy policies by considering environmental factors and their potential effects on cultural resources in landscape planning."	Yes (MZ)	Strategy revised as follows: "Comply with cultural and environmental laws, EOs, and Navy policies by considering environmental factors and their potential effects on cultural resources in landscape planning."

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112.	5-61	I.A			Valerie Vartanian (NAVFACSW)	5.14 Landscaping and Grounds Maintenance, Management Strategy I.A. Continue to update the NBVC Smart Landscape Master Plan – Landscape Plant Selection Guide for SNI and ensure that the NBVC Smart Landscape Master Plan includes sustainable water use practices, xeriscape approaches, required planting palettes, and "Do Not Plant" vegetation as identified by the Installation Natural Resource Specialist, NAVFACSW Landscape Architect, or CNRSW Botanist. Comment: Change I.A. to "Continue to update the NBVC San Nicolas Island Landscaping Plant List."	Yes (MZ)	Strategy revised as follows: "I.A. Continue to update the NBVC San Nicolas Island Landscaping Plant List."
113.	5-61	I.B.			Valerie Vartanian (NAVFACSW)	5.14 Landscaping and Grounds Maintenance, Management Strategy I.B. Consult with the "Smart Landscape" Point of Contact (e.g. Installation Natural Resource Specialist) for questions, comments, or concerns regarding the NBVC Smart Landscape Master Plan. Comment: Change I.B to "Consult with the Natural Resource Specialist for questions, comments, or concerns regarding landscaping before a project is submitted."	Yes (MZ)	Strategy revised as follows: "I.B. Consult with the Natural Resource Specialist for questions, comments, or concerns regarding landscaping before a project is submitted."
114.	5-61	I.F.			Valerie Vartanian (NAVFACSW)	5.14 Landscaping and Grounds Maintenance, Management Strategy Comment: Add "I.F. Consult with NBVC Cultural Resources Program Manager before starting any landscaping project to make sure no cultural resources will be negatively affected."	Yes (MZ)	Strategy added as follows: "I.F. Consult with NBVC Cultural Resources Program Manager before starting any landscaping project to make sure no cultural resources will be negatively affected."
115.	5-62	IV. F. 1.			Valerie Vartanian (NAVFACSW)	5.14 Landscaping and Grounds Maintenance, Management Strategy IV.F. An approved mowing schedule/map should be incorporated into this Instruction, as well as the groundskeeping contract. IV.F.1. Consider that timing when mowing occurs can help control invasive exotic weeds. Mowing at the onset of flowering, which can occur from May – December, is most effective when two to five percent of the total population of seed heads are in bloom. Mowing too early can cause increased seed production, and my incur resprouting. It can also negatively impact native species (Tu et al. 2001). Mowing too late can promote certain weeds, and mowing young plants can prevent seed production. Comment: Keep IV. F. Delete IV.F.1.	Yes (MZ)	Strategy IV.F.1 deleted. Strategy revised as follows: "IV. F. An approved mowing schedule/map should be incorporated into this Instruction, as well as the groundskeeping contract."

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116.	5-62	V			Valerie Vartanian (NAVFACSW)	5.14 Landscaping and Grounds Maintenance, Management Strategy V. Minimize the use of pesticides and herbicides in landscape management by following the NBVC Integrated Pest Management Plan. Continue to develop an Integrated Pest Management approach to dealing with pest problems at SNI. An Integrated Pest Management program is a long term program for managing pest problems, in contrast with the short term approach of relying on chemicals to abate pests. Integrated Pest Management relies on cultural, physical, mechanical, and biological methods for controlling pests, with minimal dependence on chemical control. Comment: Ensure that Integrated Pest Management Plan (IPMP) acronym is defined where it is first used.	Yes (MZ)	Integrated Pest Management Plan is first used in Chapter 4, Section 4.3.1 Terrestrial Vegetation Communities, Strategy II.A. "Follow the most current Integrated Pest Management Plan (IPMP), including prevention. This IPMP will be applied to invasive non-native species infestations." The IPMP acronym is defined where it is first used in Chapter 4, Section 4.3.1 Terrestrial Vegetation Communities, Strategy II.A.
117.	5-62	V			Valerie Vartanian (NAVFACSW)	5.14 Landscaping and Grounds Maintenance, Management Strategy V. Minimize the use of pesticides and herbicides in landscape management by following the NBVC Integrated Pest Management Plan. Continue to develop an Integrated Pest Management approach to dealing with pest problems at SNI. An Integrated Pest Management program is a long term program for managing pest problems, in contrast with the short term approach of relying on chemicals to abate pests. Integrated Pest Management relies on cultural, physical, mechanical, and biological methods for controlling pests, with minimal dependence on chemical control. Comment: Pull the following text out of "V" and insert the definition into a side bar discussion where IPMP is first used – "An Integrated Pest Management program is a long term program for managing pest problems, in contrast with the short term approach of relying on chemicals to abate pests. Integrated Pest Management relies on cultural, physical, mechanical, and biological methods for controlling pests, with minimal dependence on chemical control."	Yes (MZ)	The following discussion is pulled out into a side bar discussion next to where IPMP is first used in Chapter 4, Section 4.3.1 Terrestrial Vegetation Communities, Strategy II.A. "An Integrated Pest Management Plan is a long term plan for managing pest problems, in contrast with the short term approach of relying on chemicals to abate pests, Integrated Pest Management relies on cultural, physical, mechanical and biological methods for controlling pests, with minimal dependence on chemical control."
118.	5-62	VI.			Valerie Vartanian (NAVFACSW)	5.14 Landscaping and Grounds Maintenance, Management Strategy VI. Perform regular maintenance of any irrigation system and upgrade when appropriate. Use of inadequate landscape irrigation systems may result in over watering. Comment: Delete … "Use of inadequate landscape irrigation systems may result in over watering.	Yes (MZ)	Strategy revised as follows: "VI. Perform regular maintenance of any irrigation system and upgrade when appropriate."
119.	5-62	VI.B.			Valerie Vartanian (NAVFACSW)	5.14 Landscaping and Grounds Maintenance, Management Strategy VI.B. Upgrade manual systems and hand watering to automatic systems. Comment: Change VI.B. to … "Upgrade manual systems and hand watering to automatic "smart" systems.	Yes (MZ)	Strategy revised as follows: "VI.B. Upgrade manual systems and hand watering to automatic "smart" systems."

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120.	5-62	VII			Valerie Vartanian (NAVFACSW)	5.14 Landscaping and Grounds Maintenance, Management Strategy VII. Unless there is an identified conflict with the military mission, avoid groundskeeping practices that may affect some sensitive species, such as mowing natural areas where these species occur. Comment: Change VII to …"Unless there is an identified conflict with the military mission, avoid groundskeeping practices that may affect sensitive species."	Yes (MZ)	Strategy revised as follows: "VII. Unless there is an identified conflict with the military mission, avoid groundskeeping practices that may affect sensitive species."
121.	5-62	VII.B.			Valerie Vartanian (NAVFACSW)	5.14 Landscaping and Grounds Maintenance, Management Strategy Comment: Add "VII. B. Check timing and location of mowing in natural areas to avoid impacts to sensitive species."	Yes (MZ)	Strategy added as follows: "VII. B. Check timing and location of mowing in natural areas to avoid impacts to sensitive species."
122.	5-65	Assessment of Current Mgmt			Michelle Cox (NAVFACSW)	5.16 Outdoor Recreation Current Management, Assessment of Current Management Comment: Add sentence about disability access?	Yes (MZ)	Refer to Working Group comments for recommend changes to implement Michelle Cox (NAVFACSW) comments.
123.	5-65	Assessment of Current Mgmt			Working Group Draft Final Doc. Review Mtg. (21 OCT 2010)	5.16 Outdoor Recreation Current Management, Assessment of Current Management Comment: The Working Group discussed the development of new INRMP guidance that was recently released by the DOD in 2010. This new DOD guidance differs from the 2006 Navy guidance on the development of INRMPs. The Working Group agreed that the SNI INRMP Revision was developed when the 2006 Navy Guidance was current and the format of this INRMP document will follow that guidance. However, one change made in the 2010 DOD INRMP guidance that this INRMP will follow relates to the issue of recreation and handicap access. The Working Group agreed that a brief discussion needs to be developed for Chapter 5 Section 5.16 Outdoor Recreation that states that a future SNI Outdoor Recreation Plan will address recreational access for Navy staff and contractors that is compliant with the requirements associated with the provisions of the Americans with Disabilities Act of 1990 and the Disabled Sportsman Access Act.	Yes (MZ)	Text added as follows to end of Assessment of Current Management discussion: "The planned development of a future SNI Outdoor Recreation Plan will address recreational access for Navy staff and island personnel that ensure that any planned recreational access is compliant with the requirements associated with the provisions of the American with Disabilities Act of 1990 as amended and the Disabled Sportsman Access Act as amended."
124.	5-65	1st and 2nd Objectives on Pg 5-65			Michelle Cox (NAVFACSW)	5.16 Outdoor Recreation, Management Strategy Objective: Promote compatible, sustainable outdoor recreation opportunities which enhance quality of life for military personnel, while conserving natural resources, and without compromising the military mission. Objective: Resolve conflicts between recreation and other uses of San Nicolas Island. Comment: Delete 2nd Objective	Yes (MZ)	Objective deleted per comment.
125.	Ch 6				Mark Zegler (TDI)	6.0 Implementation Strategy Comment: Ensure that management recommendations are referred to as "Objectives and Strategies" throughout the Chapter.	Yes (MZ)	Chapter reviewed to ensure that headings consistently refer to "Objectives and Strategies."

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126.	6-4	2nd and 3rd Objectives on Pg 6-4			Michelle Cox (NAVFACSW)	6.1.4 Personnel Training, Objectives and Guidelines for INRMP Implementation Objective: Provide the organizational capacity, communication, planning functions, staffing, budgeting, and innovative technology support to ensure compliance with environmental laws, stewardship of natural resources, and continued use of San Nicolas Island's lands by the Navy. Objective: Ensure that all appropriate avenues and partnerships are investigated and sought for achieving the goals and objectives of this INRMP, for the best possible management and most efficient use of funds. Comment: Why are Objectives and Guidelines under personnel training?	Yes (MZ)	The "Objectives and Guidelines for INRMP Implementation" are moved to Section 6.5 INRMP Implementation Summary and Schedule.
127.	6-5	Strategy D			Michelle Cox (NAVFACSW)	6.1.4 Personnel Training, Objectives and Guidelines for INRMP Implementation Objective: Provide the organizational capacity, communication, planning functions, staffing, budgeting, and innovative technology support to ensure compliance with environmental laws, stewardship of natural resources, and continued use of San Nicolas Island's lands by the Navy. Objective: Ensure that all appropriate avenues and partnerships are investigated and sought for achieving the goals and objectives of this INRMP, for the best possible management and most efficient use of funds. II. Identify and ensure departments prioritize and allocate funding to support compliance requirements. D. Support the mutual goals and objectives of this INRMP and the California WAP, as well as the Orange County NCCP program, through partnership funding. Comment: D. Is it really Orange County?	Yes (MZ)	Revised as follows: "D. Support the mutual goals and objectives of this INRMP and the California Wildlife Action Plan (WAP), as well as a local Natural Community Conservation Plan (NCCP), through partnership funding."
128.	6-6	1st Objective			Michelle Cox (NAVFACSW)	6.2.1 Annual Update, Review, and Metrics, Objectives and Guidelines for INRMP Annual Review Objective: Incorporate a dynamic, continuous process for decision-making, including future changes or additions to the INRMP (USDOD 4715.DD-R 1996). Objective: Improve and refine natural resources management, by adaptively adjusting success criteria and priorities based on past accomplishments, new risks and threats, new biological information, and changes in policy. Comment: Delete 1st objective and move USDOD 4715.DD-R 1996 to 2nd Objective.	Yes (MZ)	Objective revised as follows: "Improve and refine natural resources management, by adaptively adjusting success criteria and priorities based on past accomplishments, new risks and threats, new biological information, and changes in policy (USDOD 4715.DD-R 1996)."
129.	6-16 to 6-27			Table 6-3	Mark Zegler (TDI)	6.5 INRMP Implementation Summary and Schedule Comment: Ensure that all objectives and management strategies discussed in Chapter 6 are included in Table 6-3 in the Final SNI INRMP.	Yes (MZ)	All objectives and management strategies discussed in Chapter 6 are included in Table 6-3.
130.	6-16 to 6-27			Table 6-3	Mark Zegler (TDI)	6.5 INRMP Implementation Summary and Schedule Comment: Update the INRMP Management Strategy information in Table 6-3 to reflect the changes that have occurred due to implementing comments for Chapter 4, 5, and 6.	Yes (MZ)	Table 6-3 updated to reflect the changes that have occurred due to implementing comments for Chapters 4, 5, and 6.

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131.	6-23	INRMP Management Strategy 4.8		Table 6-3	Michelle Cox (NAVFACSW)	6.5 INRMP Implementation Summary and Schedule 4.8 Data Integration, Access, and Reporting, Project Description "Set up a central clearinghouse for data, reports, and publications pertaining to the NBVC's EMS that addresses natural resources and that is accessible to staff." Comment: Change to "Set up a central clearinghouse for data, reports, and publications pertaining to the NBVC's EMS that addresses natural resources, that is accessible to staff, and that is managed by a designated data manager."	Yes (MZ)	Project description revised as follows: "Set up a central clearinghouse for data, reports, and publications pertaining to the NBVC's EMS that addresses natural resources, that is accessible to staff, and that is managed by a designated data manager."
132.	6-28	First			Working Group Draft Final Doc. Review Mtg. (21 OCT 2010)	6.6 Implementation Funding and Costs "Table 6-5 and Table 6-6 summarize the potential funding source and estimated costs and schedule for implementing all natural resources projects identified in this INRMP. The SAIA requires implementation of this INRMP. Some costs estimates are based on accomplishing tasks with installation staff; others are based on contracting work to specialists. This implementation schedule is suggested for long-term planning purposes; however, the schedule may be modified based on need, resources, and seasonal requirements. For example, the Conservation Program Manager has been very successful at organizing volunteers to conduct tree plantings, and at maintaining cooperative relationships with universities to conduct studies on SNI. This results in significant cost reductions where skilled labor is not required." Comment: The Working Group agreed that funding and costs will not be discussed in the INRMP. The Working Group also agreed that a discussion for Chapter 6 Section 6.6 Implementation Funding and Costs needs to be developed that states that INRMP implementation is subject to the provisions of the Federal Antideficiency Act.	Yes (MZ)	Section Heading revised as follows: 6.6. Implementation Funding Text revised as follows: Table 6-5 summarizes the supporting INRMP management strategies discussed in Chapter 4 and 5, the EPR funding code, project name, and potential funding source for implementing all natural resources projects identified in this INRMP. The SAIA requires implementation of this INRMP; however, INRMP implementation is also subject to the provisions of the Federal Antideficiency Act. Some INRMP projects are accomplished with installation staff; others involve contracting work to specialists. The implementation schedule identified in Table 6-4 INRMP Implementation Summary is suggested for long-term planning purposes; however, the schedule may be modified based on need, resources, and seasonal requirements.

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133.	6-28	First			Michelle Cox (NAVFACSW)	6.6 Implementation Funding and Costs "Table 6-5 and Table 6-6 summarize the potential funding source and estimated costs and schedule for implementing all natural resources projects identified in this INRMP. The SAIA requires implementation of this INRMP. Some costs estimates are based on accomplishing tasks with installation staff; others are based on contracting work to specialists. This implementation schedule is suggested for long-term planning purposes; however, the schedule may be modified based on need, resources, and seasonal requirements. For example, the Conservation Program Manager has been very successful at organizing volunteers to conduct tree plantings, and at maintaining cooperative relationships with universities to conduct studies on SNI. This results in significant cost reductions where skilled labor is not required." Comment: Delete "…and estimated costs."	Yes (MZ)	Text revised as follows: Table 6-5 summarizes the supporting INRMP management strategies discussed in Chapter 4 and 5, the EPR funding code, project name, and potential funding source for implementing all natural resources projects identified in this INRMP. The SAIA requires implementation of this INRMP; however, INRMP implementation is also subject to the provisions of the Federal Antideficiency Act. Some INRMP projects are accomplished with installation staff; others involve contracting work to specialists. The implementation schedule identified in Table 6-4 INRMP Implementation Summary is suggested for long-term planning purposes; however, the schedule may be modified based on need, resources, and seasonal requirements.
134.	6-28	First			Michelle Cox (NAVFACSW)	6.6 Implementation Funding and Costs "Table 6-5 and Table 6-6 summarize the potential funding source and estimated costs and schedule for implementing all natural resources projects identified in this INRMP. The SAIA requires implementation of this INRMP. Some costs estimates are based on accomplishing tasks with installation staff; others are based on contracting work to specialists. This implementation schedule is suggested for long-term planning purposes; however, the schedule may be modified based on need, resources, and seasonal requirements. For example, the Conservation Program Manager has been very successful at organizing volunteers to conduct tree plantings, and at maintaining cooperative relationships with universities to conduct studies on SNI. This results in significant cost reductions where skilled labor is not required." Comment: Delete 3rd sentence on cost estimates.	Yes (MZ)	Text revised as follows: Table 6-5 summarizes the supporting INRMP management strategies discussed in Chapter 4 and 5, the EPR funding code, project name, and potential funding source for implementing all natural resources projects identified in this INRMP. The SAIA requires implementation of this INRMP; however, INRMP implementation is also subject to the provisions of the Federal Antideficiency Act. Some INRMP projects are accomplished with installation staff; others involve contracting work to specialists. The implementation schedule identified in Table 6-4 INRMP Implementation Summary is suggested for long-term planning purposes; however, the schedule may be modified based on need, resources, and seasonal requirements.

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135.	6-29 to 6-31			Table 6-5	Mark Zegler (TDI)	6.6 Implementation Funding and Costs Comment: Ensure that the INRMP Management Strategies identified in Table 6-5 are updated to reflect the changes that have occurred to Chapters 4-6 due to comment implementation.	Yes (MZ)	INRMP Management strategies identified in Table 6-5 are updated to reflect the changes that have occurred to Chapters 4-6 due to comment implementation.
136.	Ch 7				Working Group Draft Final Doc. Review Mtg. (21 OCT 2010)	7.0 References The Working Group did not provide any comments for Chapter 7.	N/A	
137.	App A				Working Group Draft Final Doc. Review Mtg. (21 OCT 2010)	Appendix A – Acronyms The Working Group did not provide any comments for Appendix A during the Draft Final Document Review Meeting.	N/A	
138.	App A				Valerie Vartanian (NAVFACSW)	Appendix A – Acronyms Comment: Ensure that Integrated Pest Management Plan (IPMP) acronym is included in Appendix A.	Yes (MZ)	The Integrated Pest Management Plan (IPMP) acronym is included in Appendix A
139.	App A				Michelle Cox (NAVFACSW)	Appendix A – Acronyms Comment: Ensure that Natural Community Conservation Plan (NCCP) is included in Appendix A.	Yes (MZ)	The Natural Community Conservation Plan (NCCP) acronym is included in Appendix A.
140.	App B				Working Group Draft Final Doc. Review Mtg. (21 OCT 2010)	Appendix B – Laws, Regulations, Instructions, and Directives Comment: The Working Group discussed the development of new INRMP guidance that was recently released by the DOD in 2010. This new DOD guidance differs from the 2006 Navy guidance on the development of INRMPs. The Working Group agreed that the SNI INRMP Revision was developed when the 2006 Navy Guidance was current and the format of this INRMP document will follow that guidance. However, one change made in the 2010 DOD INRMP guidance that this INRMP will follow relates to the issue of recreation and handicap access. The Working Group agreed that a brief discussion needs to be developed for Chapter 5 Section 5.16 Outdoor Recreation that states that a future SNI Outdoor Recreation Plan will address recreational access for Navy staff and contractors that is compliant with the requirements associated with the provisions of the Americans with Disabilities Act of 1990 and the Disabled Sportsman Access Act. Comment: Add the "Americans with Disabilities Act of 1990" and the "Disabled Sportsman Access Act" to a new section titled "B.1.3 Other Federal Laws."	Yes (MZ)	Developed Section B.1.3. Other Federal Laws and included the following Acts in that section: Americans with Disabilities Act, Anti-Deficiency Act, Data Quality Act, Defense Appropriation Act, Disables Sportsman Access Act, Emergency Planning and Right-to-Know Act, Federal Facilities Compliance Act, Military Construction and Authorization Act, Military Construction and Authorization Act – Leases/Non-Excess Property, Military Construction Authorization Act – Military Reservation and Facilities – Hunting, Fishing and Trapping, National Trails System Act, and the Outdoor Recreation – Federal/State Programs Act.

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141.	App C				Working Group Draft Final Doc. Review Mtg. (21 OCT 2010)	Appendix C – List of Projects Members of the Navy planning team commented that codes could be developed to help reference EPR projects and Natural Resource In House Projects. Other members of the Navy planning team responded by identifying that current and future EPR funding codes already represent a coding system that can be used to track INRMP projects. Furthermore, it was noted that Tamara Conkle of the Navy had already signed off and approved the current implementation table and list of projects included in the Draft Final INRMP. At the Draft Final INRMP document review meeting it was agreed that if any further changes are identified by NBVC Environmental Division, they may be able to implement those recommended changes during a future annual INRMP review. Thus, the Implementation Summary Table in Chapter 6 and the List of Projects in Appendix C that were included in the SNI Draft Final INRMP will be also be included in the Final INRMP without any changes or modifications to the coding scheme that has been used.	N/A	The Implementation Summary Table in Chapter 6 and the List of Projects in Appendix C that were included in the SNI Draft Final INRMP are included in the Final INRMP. The only modifications that are made to the Implementation Summary Table or Appendix C are those that reflect changes to management strategies in Chapters 4 and 5. Appendix C also includes the projects supported by management strategies identified in Chapter 6.
142.	App C				Michelle Cox (NAVFACSW)	Appendix C – List of Projects Comment: Ensure that revisions to management strategies in Chapters 4,5 and 6 are updated in Table 6-3 INRMP Implementation Summary and in the list of projects from 2011-2030 included in Appendix C.	Yes (MZ)	Revisions to management strategies in Chapters 4,5, and 6 are updated in Table 6-3 and included in the list of projects from 2011-2030 in Appendix C.
143.	App C				Mark Zegler (TDI)	Appendix C – List of Projects Comment: Ensure that all projects supported by objectives and management strategies discussed in Chapter 6 are included in Table 6-3 and are included in Appendix C in the Final SNI INRMP.	Yes (MZ)	All projects supported by objectives and management strategies discussed in Chapter 6 are included in Table 6-3 and are included in Appendix C.
144.	App D				Working Group Draft Final Doc. Review Mtg. (21 OCT 2010)	Appendix D – Benefits for Endangered Species The Working Group did not have any comments for Appendix D.	N/A	
145.	App D				Mark Zegler (TDI)	Appendix D – Benefits for Endangered Species Comment: Ensure that the objectives and management strategies referenced in Appendix D reflect the changes that occurred to the objectives and management strategies in Chapters 4-6 based on the comments that were received for the Draft-Final SNI INRMP.	Yes (MZ)	The discussion, objectives, and management strategies included in the INRMP have been updated for inclusion in Appendix D.
146.	E-9 to E-15			Table E-4	Michelle Cox (NAVFACSW) and Grace Smith (NAVAIR)	E.2 Invertebrates, Terrestrial – Insects, Spiders, and Related Animals Comment: Add Grace's fly to the current list in Table E-4. INSECTA Diptera (two-winged flies) Therevidae (stiletto flies) *Thereva smithae*, Holston and Irwin 2005	Yes (MZ)	*Thereva smithae* is added to E.2 Invertebrates, Terrestrial – Insects, Spiders, and Related Animals.

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147.	E-22 to E-26			Table E-6	Working Group Draft Final Doc. Review Mtg. (21 OCT 2010)	E.4 Marine Species The Working Group discussed the need to organize the marine species list in Section E.4 into invertebrates, vertebrates, and algae in order to more closely parallel the organization of the species list for the terrestrial environment.	Yes (MZ)	Refer to John Ugoretz (NAVAIR) comments for recommend changes to implement Working Group comments. Marine Species List revised by John Ugoretz (NAVAIR) and is included in Appendix E, Section E.4 of the SNI Final INRMP.
148.	E-22 to E-26			Table E-6	Working Group Draft Final Doc. Review Mtg. (21 OCT 2010)	E.4 Marine Species The Working Group discussed the need to reference the sources used to develop the marine species list.	Yes (MZ)	Refer to John Ugoretz (NAVAIR) comments for recommend changes to implement Working Group comments. Marine Species List revised by John Ugoretz (NAVAIR) and is included in Appendix E, Section E.4 of the SNI Final INRMP.
149.	E-22 to E-26			Table E-6	Working Group Draft Final Doc. Review Mtg. (21 OCT 2010)	E.4 Marine Species The Working Group requested that TDI ensure that the marine species list include marine species such as black abalone, white abalone, pinnipeds, and sea otters.	Yes (MZ)	Refer to John Ugoretz (NAVAIR) comments for recommend changes to implement Working Group comments. Marine Species List revised by John Ugoretz (NAVAIR) and is included in Appendix E, Section E.4 of the SNI Final INRMP.
150.	E-22 to E-26			Table E-6	Michelle Cox (NAVFACSW)	E.4 Marine Species Comment: Add abalone, marine mammals Comment: Categorize marine list	Yes (MZ)	Refer to John Ugoretz (NAVAIR) comments for recommend changes to implement Working Group comments. Marine Species List revised by John Ugoretz (NAVAIR) and is included in Appendix E, Section E.4 of the SNI Final INRMP.
151.	E-22 to E-26				John Ugoretz (NAVAIR)	E.4 Marine Species Comment: I would title Table E-6 “Conspicuous Marine Species.”	Yes (MZ)	Section E.4 titled Conspicuous Marine Species. Section E.4 includes Table E-6 Marine Plants and Algae, Table E-7 Marine Invertebrates, Table E-8 Marine Fishes, and Table E-9 Pinnipeds and Fissiped.

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152.	E-22 to E-26				John Ugoretz (NAVAIR)	E.4 Marine Species Comment: One thing I realized while revising the marine species lists is that these lists are simply not as comprehensive as terrestrial lists (nor can they be). Few (if any) subtidal surveys are actually searching for all species present and many cryptic, small, or transient species are not seen/found. So, I think it is important to have some sort of header/footer that is like what I've added: "It is important to note that marine species lists should not be considered complete listings of all species present in an area. The marine environment is highly dynamic and individual animals may move over great distances. Additionally, surveys of marine species are limited in their ability to detect and document species due to the complex nature of the environment and methodological limitations. The following should be considered lists of relatively abundant or conspicuous species. Cryptic, sparse, or otherwise difficult to identify species may not be represented."	Yes (MZ)	The introductory language to Section E.4 Conspicuous Marine Species is as follows: "It is important to note that marine species lists should not be considered complete listings of all species present in an area. The marine environment is highly dynamic and individual animals may move over great distances. Additionally, surveys of marine species are limited in their ability to detect and document species due to the complex nature of the environment and methodological limitations. The following should be considered lists of relatively abundant or conspicuous species. Cryptic, sparse, or otherwise difficult to identify species may not be represented."
153.	E-22 to E-26				John Ugoretz (NAVAIR)	E.4 Marine Species Comment: I added a column for "status" since two abalone species are endangered, one fish species is overfished, and all the mammals have MMPA protection (at a minimum). Note that I did not label the marine mammal section "marine mammals" since we are really only considering seals / sea lions / southern sea otter. I labeled it "pinnipeds and fissiped."	Yes (MZ)	Table E-6 Marine Plants and Algae, Table E-7 Marine Invertebrates, Table E-8 Marine Fishes, and Table E-9 Pinnipeds and Fissiped all include a "status" column as requested per comment.
154.	E-22 to E-26				John Ugoretz (NAVAIR)	E.4 Marine Species The Working Group discussed the need to organize the marine species list in Section E.4 into invertebrates, vertebrates, and algae in order to more closely parallel the organization of the species list for the terrestrial environment. Comment: Include new "Marine Plants and Algae" table in E.4 Marine Species.	Yes (MZ)	Section E.4 includes Table E-6 Marine Plants and Algae, Table E-7 Marine Invertebrates, Table E-8 Marine Fishes, and Table E-9 Pinnipeds and Fissiped.

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155.	E-22 to E-26				John Ugoretz (NAVAIR)	E.4 Marine Species The Working Group discussed the need to reference the sources used to develop the marine species list. Comment: Reference Sources for the new "Marine Plants and Algae" table: 1) Daniel Pondella, Vantuna Research Group, subtidal surveys conducted as part of the Southern California Coastal Water Research Project's BIGHT '08 program (2008-2009). 2) Pete Raimondi, UCSC, PISCO intertidal surveys conducted as part of the ASBS storm water exemption package. 3) Merkel & Associates, Inc, Naval Base Ventura County, San Nicolas Island Area of Special Biological Significance Biological Survey Report (2007)	Yes (MZ)	Table E-6 Marine Plants and Algae revised as follows: "Sources: Daniel Pondella, Vantuna Research Group, subtidal surveys conducted as part of the Southern California Coastal Water Research Project's BIGHT '08 program (2008-2009). Pete Raimondi, UCSC, PISCO intertidal surveys conducted as part of the ASBS storm water exemption package. Merkel & Associates, Inc, Naval Base Ventura County, San Nicolas Island Area of Special Biological Significance Biological Survey Report (2007)"
156.	E-22 to E-26				John Ugoretz (NAVAIR)	E.4 Marine Species The Working Group discussed the need to organize the marine species list in Section E.4 into invertebrates, vertebrates, and algae in order to more closely parallel the organization of the species list for the terrestrial environment. Comment: Include new "Marine Invertebrates" table in E.4 Marine Species.	Yes (MZ)	Section E.4 includes Table E-6 Marine Plants and Algae, Table E-7 Marine Invertebrates, Table E-8 Marine Fishes, and Table E-9 Pinnipeds and Fissiped.
157.	E-22 to E-26				John Ugoretz (NAVAIR)	E.4 Marine Species The Working Group discussed the need to reference the sources used to develop the marine species list. Comment: Reference Sources for the new "Marine Invertebrates" table: 1) Daniel Pondella, Vantuna Research Group, subtidal surveys conducted as part of the Southern California Coastal Water Research Project's BIGHT '08 program (2008-2009). 2) Pete Raimondi, UCSC, PISCO intertidal surveys conducted as part of the ASBS storm water discharge exemption process (2007-2009). 3) Merkel & Associates, Inc, NAVAL BASE VENTURA COUNTY, SAN NICOLAS ISLAND AREA OF SPECIAL BIOLOGICAL SIGNIFICANCE BIOLOGICAL SURVEY REPORT (2007) 3) Ian Taniguchi, CDFG, pers. comm. 4) John Ugoretz, NAVAIR marine biologist, pers. comm	Yes (MZ)	Table E-7 Marine Invertebrates revised as follows: "Sources: Daniel Pondella, Vantuna Research Group, subtidal surveys conducted as part of the Southern California Coastal Water Research Project's BIGHT '08 program (2008-2009). Pete Raimondi, UCSC, PISCO intertidal surveys conducted as part of the ASBS storm water discharge exemption process (2007-2009). Merkel & Associates, Inc, Naval Base Ventura County, San Nicolas Island Area of Special Biological Significance Biological Survey Report (2007) Ian Taniguchi, CDFG, pers. comm. John Ugoretz, NAVAIR marine biologist, pers. comm."

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158.	E-22 to E-26				John Ugoretz (NAVAIR)	E.4 Marine Species The Working Group discussed the need to organize the marine species list in Section E.4 into invertebrates, vertebrates, and algae in order to more closely parallel the organization of the species list for the terrestrial environment. Comment: Include new "Fishes" table in E.4 Marine Species.	Yes (MZ)	Section E.4 includes Table E-6 Marine Plants and Algae, Table E-7 Marine Invertebrates, Table E-8 Marine Fishes, and Table E-9 Pinnipeds and Fissiped.
159.	E-22 to E-26				John Ugoretz (NAVAIR)	E.4 Marine Species The Working Group discussed the need to reference the sources used to develop the marine species list. Comment: Reference Sources for the new "Fishes" table: 1) Biogeography of the nearshore rocky-reef fishes at the southern and Baja California islands, Daniel J. Pondella II, Brooke E. Gintert, Jana R. Cobb and Larry G. Allen, Journal of Biogeography (J. Biogeogr.) (2005) 32, 187–201 2) Merkel & Associates, Inc, Naval Base Ventura County, San Nicolas Island Area of Special Biological Significance Biological Survey Report (2007) 3) John Ugoretz, NAVAIR marine biologist, pers. Comm.	Yes (MZ)	Table E-8 Marine Fishes revised as follows: "Sources: Biogeography of the nearshore rocky-reef fishes at the southern and Baja California islands, Daniel J. Pondella II, Brooke E. Gintert, Jana R. Cobb and Larry G. Allen, Journal of Biogeography (J. Biogeogr.) (2005) 32, 187-201 Merkel & Associates, Inc, Naval Base Ventura County, San Nicolas Island Area of Special Biological Significance Biological Survey Report (2007) John Ugoretz, NAVAIR marine biologist, pers. comm."
160.	E-22 to E-26				John Ugoretz (NAVAIR)	E.4 Marine Species The Working Group discussed the need to organize the marine species list in Section E.4 into invertebrates, vertebrates, and algae in order to more closely parallel the organization of the species list for the terrestrial environment. Comment: Include new "Pinnipeds and Fissiped" table in E.4 Marine Species.	Yes (MZ)	Section E.4 includes Table E-6 Marine Plants and Algae, Table E-7 Marine Invertebrates, Table E-8 Marine Fishes, and Table E-9 Pinnipeds and Fissiped.
161.	E-22 to E-26				John Ugoretz (NAVAIR)	E.4 Marine Species The Working Group discussed the need to reference the sources used to develop the marine species list. Comment: Reference Sources for the new "Pinnipeds and Fissiped" table: 1) Naval Air Warfare Center Weapons Division (NAWCWD). 2002. Final Environmental Impact Statement / Overseas Environmental Impact Statement for Point Mugu Sea Range. Prepared by U.S. Department of the Navy, Naval Air Systems Command, Naval Air Warfare Center Weapons Division, Point Mugu, California.	Yes (MZ)	Table E-9 Pinnipeds and Fissiped revised as follows: Sources: Sea Range EIS

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162.	App F (F-1 to F-8)				Working Group Draft Final Doc. Review Mtg. (21 OCT 2010)	Appendix F – Landscaping Plant List Comment: The Working Group discussed the fact that the landscaping list included in Appendix F was based on the NBVC Approved Plant List. This Approved Plant List was developed for Naval Air Station Point Mugu and was not intended to be applicable for use on SNI. Members of the Working Group from NBVC Environmental Division agreed to review and develop a landscaping plant list specific for use on SNI.	Yes (MZ)	Refer to Valerie Vartanian (NAVFACSW), Martine Ruane (NBVC), Grace Smith (NAVAIR), John Ugoretz (NAVAIR) comments for recommend changes to implement Working Group comments.
163.	App F (F-1 to F-8)				Valerie Vartanian (NAVFACSW), Martine Ruane (NBVC), Grace Smith (NAVAIR), John Ugoretz (NAVAIR)	Appendix F – Landscaping Plant List Comment: Change the title of this Appendix to "Appendix F – San Nicolas Island Landscaping Plant List."	Yes (MZ)	Appendix F title revised as follows: "San Nicolas Island Landscaping Plant List"
164.	App F (F-1 to F-8)				Valerie Vartanian (NAVFACSW), Martine Ruane (NBVC), Grace Smith (NAVAIR), John Ugoretz (NAVAIR)	Appendix F – Landscaping Plant List Comment: Add the following discussion to Appendix F to introduce the San Nicolas Island Landscaping Plant List. "The following list contains approved native plants for use on San Nicolas Island (SNI). Due to strict biosecurity measures, plants and/or soil may not be brought to the island in order to reduce the threat of transmitting disease or pests. All plants listed below may either be developed from stock on the island or brought in from seed. ANY PLANT MATERIAL MUST BE APPROVED BY NBVC ENVIRONMENTAL BEFORE TRANSPORT TO SNI. Other plants may be requested and approved by NBVC Environmental. Use the Landscaping Guidelines which provide web sources to identify plants that are not known to be invasive at this time. Contact NBVC Environmental to receive these guidelines."	Yes (MZ)	Introductory discussion to Appendix F included as follows: "The following list contains approved native plants for use on San Nicolas Island (SNI). Due to strict biosecurity measures, plants and/or soil may not be brought to the island in order to reduce the threat of transmitting disease or pests. All plants listed below may either be developed from stock on the island or brought in from seed. ANY PLANT MATERIAL MUST BE APPROVED BY NBVC ENVIRONMENTAL BEFORE TRANSPORT TO SNI. Other plants may be requested and approved by NBVC Environmental. Use the Landscaping Guidelines which provide web sources to identify plants that are not known to be invasive at this time. Contact NBVC Environmental to receive these guidelines."

COMMENT MATRIX

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165.	App F (F-1 to F-8)			Table F-1	Valerie Vartanian (NAVFACSW), Martine Ruane (NBVC), Grace Smith (NAVAIR), John Ugoretz (NAVAIR)	Appendix F – Landscaping Plant List Comment: Delete Table F-1. Naval Base Ventura County Approved Plant List. (Native Status: N=Native to Ventura County, CA = Other California Native, E = Exotic, Irrigation Needs: L=Low Water, M=Moderate Water, L-M=Low to Moderate Water).	Yes (MZ)	Table F-1 Naval Base Ventura County Approved Plant List that was included in the Draft Final SNI INRMP is deleted from the Final SNI INRMP.

COMMENT MATRIX

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166.	App F (F-1 to F-8)			Table F-1	Valerie Vartanian (NAVFACSW), Martine Ruane (NBVC), Grace Smith (NAVAIR), John Ugoretz (NAVAIR)	Appendix F – Landscaping Plant List Comment: Replace Table F-1 with the following list of Herbaceous Plants – native perennials grown in the island native plant nursery. *Abornia umbellatum* *Abronia maritima* *Achillea millefolium* *Ambrosia chamissonis* *Artemesia nesiotica*, endemic perennial *Astragalus traskiae*, endemic perennial *Atriplex pacifica* *Atriplex watsonii*, perennial *Baccharis pilularis ssp. consanguinea* *Calystegia macrostegia amplissima*, endemic perennial *Camissonia cheiranthifolia ssp. suffruticosa* *Cirsium occidentale* *Coreopsis gigantea* *Dudleya virens*, endemic perennial, use salvaged or seed grown only *Eriogonum grande*, endemic perennial *Heliotropium curassavicum* *Hemizonia clementina*, endemic perennial *Isocoma menziesii* *Lomatium insulare*, endemic perennial *Lotus argophyllus*, endemic *Lupinus albifrons* *Malocothrix saxatilis var. implicata* *Marah macrocarpus* *Nassella cernua*, from seed only *Stipa diegoensis*, from seed only	Yes (MZ)	Appendix F – San Nicolas Island Landscaping Plant List includes the following list: "Herbaceous Plants - native perennials grown in the island native plant nursery. Abronia maritima Abronia umbellatum Achillea millefolium Ambrosia chamissonis Artemesia nesiotica, endemic perennial Astragalus traskiae, endemic perennial Atriplex pacifica Atriplex watsonii, perennial Baccharis pilularis ssp. consanguinea Calystegia macrostegia amplissima, endemic perennial Camissonia cheiranthifolia ssp. suffruticosa Cirsium occidentale Coreopsis gigantea Dudleya virens, endemic perennial, use salvaged or seed grown only Eriogonum grande, endemic perennial Heliotropium curassavicum Hemizonia clementina, endemic perennial Isocoma menziesii Lomatium insulare, endemic perennial Lotus argophyllus, endemic Lupinus albifrons Malocothrix saxatilis var. implicata Marah macrocarpus Nassella cernua, from seed only Stipa diegoensis, from seed only"

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167.	App G				Working Group Draft Final Doc. Review Mtg. (21 OCT 2010)	Appendix G – Reporting on Migratory Bird Requirements The Working Group did not have any comments for Appendix G.	N/A	
168.	App H				Working Group Draft Final Doc. Review Mtg. (21 OCT 2010)	Appendix H – Biological Opinion The Working Group discussed the need to include both the Programmatic Biological Opinion for Activities on San Nicolas Island, California (1-8-01-F-14) and the Biological Opinion for the San Nicolas Island Wind Energy Project, Ventura County, California (8-8-10-F-35) in Appendix H.	Yes (MZ)	Appendix H – Biological Opinion includes the following BO's in the Final INRMP: (1) Programmatic Biological Opinion for Activities on San Nicolas Island, California (1-8-01-F-14), (2) Biological Opinion for the San Nicolas Island Wind Energy Project, Ventura County, California (8-8-10-F-35).
169.	App H				Michelle Cox (NAVFACSW)	Appendix H – Biological Opinion Comment: Add Wind Energy Biological Opinion.	Yes (MZ)	Appendix H – Biological Opinion includes the following BO's in the Final INRMP: (1) Programmatic Biological Opinion for Activities on San Nicolas Island, California (1-8-01-F-14), (2) Biological Opinion for the San Nicolas Island Wind Energy Project, Ventura County, California (8-8-10-F-35).
170.	App I				Working Group Draft Final Doc. Review Mtg. (21 OCT 2010)	Appendix I – Public Comments Comment: The Working Group discussed the receipt of the Memorandum submitted by the CDFG regarding the NBVC SNI INRMP and agreed that the Memo should be included as part of the public comment record in Appendix I.	Yes (MZ)	CDFG Memorandum dated 20 OCT 2010 included in Appendix I in Final SNI INRMP.
171.	App I				Working Group Draft Final Doc. Review Mtg. (21 OCT 2010)	Appendix I – Public Comments Comment: The Working Group agreed that the Public Notice that announced the 30 day public review of the Draft Final INRMP should also be included as part of the public comment record in Appendix I.	Yes (MZ)	Ventura County Star Public Notice included in Appendix I in the Final SNI INRMP.
172.	App I				Working Group Draft Final Doc. Review Mtg. (21 OCT 2010)	Appendix I – Public Comments Comment: The Working Group agreed that a Master Comment Matrix developed by TDI, which will include all the comments received during the 30 day public comment period as well as other comments offered during a Working Group document review meeting and submitted by CDFG and Navy staff after the comment period had ended, will also be included as part of the public comment record in Appendix I.	Yes (MZ)	Draft Final SNI INRMP Master Comment Matrix included in Appendix I in the Final SNI INRMP.

COMMENT MATRIX

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173.	App J				Working Group Draft Final Doc. Review Mtg. (21 OCT 2010)	Appendix J – Future Surveys The Working Group clarified that this appendix served as a placeholder where the results of all future natural resource surveys can be included in the INRMP as part of the Annual review and update process. The Working Group agreed upon the purpose of this Appendix and did not have any comments for that appendix.	N/A	
174.	App K				Working Group Draft Final Doc. Review Mtg. (21 OCT 2010)	Appendix K – Research Projects TDI explained to the Working Group that the Draft Final INRMP did not include an appendix that identified all of the research projects discussed in Chapter 4 and 5. The 2006 Navy INRMP guidance identified this appendix as a requirement for the development of INRMPs. TDI agreed to review Chapter 4 and 5 and develop an appendix that lists all of the potential research projects identified in the management strategies of the INRMP. TDI agreed to include in the SNI Final INRMP this new appendix as Appendix K – Research Projects.	Yes (MZ)	Appendix K included in the Final SNI INRMP. The introductory discussion to this appendix is as follows: "This appendix fulfills the "Research Requirements Appendix" that is required in INRMP's according to a Memorandum dated August 14, 2006 from the Office of the Under Secretary of Defense for the Deputy Assistant Secretary of the Navy (Environment) regarding the INRMP Template. This 2006 Memo stated that research requirements are projects that would be nice to do by an installation but there is no legal obligation to support. The concept behind this appendix is that it will allow the installation and other entities (e.g., the DOD Strategic Environmental Research and Development Program) to quickly assess if there are any projects available for funding if it became available. Table identifies all the natural resource management strategies included in Chapters 4 and 5 of the SNI INRMP that represent discretionary research tasks that the NBVC ED can perform in support of the conservation and stewardship of SNI's natural resources."

COMMENT MATRIX

NO.	PAGE NO.	PARA-GRAPH	LINE NO.	FIGURE/ TABLE NO.	Commenter	RECOMMENDED CHANGES *(Exact wording of suggested change)*	INCORP *(Yes, No, N/A)*	HOW COMMENT WAS INCORPORATED *(If not incorporated, why?)*
175.	App L				Working Group Draft Final Doc. Review Mtg. (21 OCT 2010)	Appendix L – Tripartite Memorandum of Understanding The Working Group discussed the need to include the 2006 Memorandum of Understanding among the U.S. Department of Defense, the U.S. Fish and Wildlife Service, and the International Association of Fish and Wildlife Agencies for a Cooperative Integrated Natural Resource Management Program on Military Installations in the SNI Final INRMP. This Memorandum of Understanding (MOU) clarifies the roles and responsibilities of the three parties in preparing, reviewing, and implementing INRMPs on military installations. TDI agreed to include in the SNI Final INRMP this 2006 MOU as Appendix L – Tripartite Memorandum of Understanding.	Yes (MZ)	The 2006 Tripartite MOU is included in Appendix L – Tripartite Memorandum of Understanding in the Final SNI INRMP.
176.	App L				Michelle Cox (NAVFACSW)	Appendix L – Tripartite Memorandum of Understanding Comment: Add Tripartite Memo Appendix.	Yes (MZ)	The 2006 Tripartite MOU is included in Appendix L – Tripartite Memorandum of Understanding in the Final SNI INRMP.

Appendix J: Future Surveys

The purpose of this Appendix is to provide SNI resource managers with an opportunity to annually update information in the INRMP with the results of surveys for each year in which they are conducted.

The recurring surveys at SNI include black abalone surveys, white abalone surveys, Western snowy plover surveys, Island night lizard surveys, reptile surveys, San Nicolas Island fox surveys, small mammal surveys, bat surveys, pinniped surveys, seabird surveys, shorebird surveys, resident bird surveys, vegetation surveys, rare plant surveys, wetland delineation surveys, sandy beach surveys, rocky intertidal surveys, unvegetated and vegetated soft bottom surveys, and rocky reef kelp forest surveys. The results of these surveys can be placed in this Appendix for future use and reference.

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J.1 Black Abalone Surveys

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J.2 White Abalone surveys

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J.3 Western Snowy Plover Surveys

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J.4 Island Night Lizard Surveys

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J.5 Reptile Surveys

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J.6 San Nicolas Island Fox Surveys

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J.7 Small Mammal Surveys

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J.8 Bat Surveys

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J.9 Pinniped Surveys

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J.10 Seabird Surveys

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J.11 Shorebird Surveys

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J.12 Resident Bird Surveys

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J.13 Vegetation Surveys

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J.14 Rare Plant Surveys

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J.15 Wetland Delineation Surveys

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J.16 Sandy Beach Surveys

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J.17 Rocky Intertidal Surveys

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J.18 Unvegetated and Vegetated Soft Bottom Surveys

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J.19 Rocky Reef Kelp Forest Surveys

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Appendix K: Research Requirements

This appendix fulfills the "Research Requirements Appendix" that is required in INRMP's according to a Memorandum dated 14 August 2006 from the Office of the Under Secretary of Defense for the Deputy Assistant Secretary of the Navy (Environment) regarding the INRMP Template. This 2006 Memo stated that research requirements are projects that would be nice to do by an installation but there is no legal obligation to support. The concept behind this appendix is that it will allow the installation and other entities (e.g., the DOD Strategic Environmental Research and Development Program) to quickly assess if there are any projects available for funding if it became available. Table K-1 identifies all the natural resource management strategies included in Chapters 4 and 5 of the SNI INRMP that represent discretionary research tasks that the NBVC ED can perform in support of the conservation and stewardship of SNI's natural resources.

Table K-1. Natural Resource Management Strategies for Research from Chapter 4 and 5 of the INRMP.

INRMP Management Strategy
4.1 Ecosystem Approach
IV. Research effects from long-term regional change including but not limited to climate change.
V.A. Support cooperative research ventures with schools, universities, and non-profit scientific research organizations.
VII.B. Design substrates that are amenable to occupation by intertidal and subtidal biota during the refurbishment and construction of new armored shorelines as implemented in the Military Construction Projects (MILCON) P-793 Navy Lighterage Project.
VII. C. Design against the occupation of shoreline stabilizing structures by terrestrial predators that can negatively impact the success of endangered species programs.
4.2.1 Water Resources and Water Quality
I.B.1. Relate the diversity and abundance of marine life to attributes of the substrate and water quality where they live, and manage substrate and water quality directly.
II.A. Assess non-military uses at SNI for contributions to water conservation or impacts to water resources.
4.2.2 Soil Conservation
I.2.a. Assess and evaluate storm runoff and wind erosion and its effect on particularly vulnerable areas.
I.3.a. Investigate the use of permeable ground cover types (e.g. gravel) to slow runoff and increase percolation.
I.C. Implement roadway improvement recommendations and investigate redirecting runway runoff to the ocean.
II.A. Conduct an island-wide soil erosion and restoration assessment to determine what sites are actively eroding, which are not, and which have potential for restoration.
II.B. Assess and implement cost-effective means to reduce gully development or expansion.
IV. In tandem with other monitoring and mapping efforts, assess indicators of soil health.
VI.Map biological crusts.
VII. Support research on biological crust diversity and function in order to understand conservation needs.
VIII. Determine environmental conditions required to maintain functioning biological crust - list threats, strategies to restore, salvage, and promote.
4.2.3 Wildland Fire Management
III.A. Complete a landscape-scale risk/hazard assessment that identifies high values at risk, prescribes preemptive action to protect the values and sets priorities for implementation.
III.A.1.Develop post-fire rehabilitation guidelines appropriate to SNI and these plant communities.
III.A.2.Identify any fine fuels management areas.
IV. Determine fire frequency within habitats when considering future fire planning.
VI. Develop a database to track all fires, including acres burned, how suppressed and agency or personnel who suppressed the fire.
4.3.1 Terrestrial Vegetation Communities
I. Develop threat analysis for each vegetation community.
X. Encourage research that can better define the extent, nature, and value of vegetation resources of SNI, and that helps sort out priority management actions to address risks and vulnerabilities related to these values.
4.3.1.1 Coastal Scrub
II. Define and map the boundaries of all coastal scrub cover types. Compare to historical photographs to evaluate trend and recruitment.

Table K-1. Natural Resource Management Strategies for Research from Chapter 4 and 5 of the INRMP.

INRMP Management Strategy
II.A. Identify the boundaries and condition of coreopsis scrub through the vegetation mapping program.
II.B. Identify the boundaries and condition of caliche scrub through the vegetation mapping program.
4.3.1.4 Investigate the processes such as wildland fire needed to sustain grasslands.
4.3.1.6 Beach and Dune
II. Investigate dune drift processes on SNI.
4.3.3.1 Sandy Beaches
I.A. Support scientifically recognized methodologies and surveys to evaluate individual beaches with special emphasis on indicator species, endemics, invasives, and protected species.
I.B. Complete GIS delineations of sandy beach habitat throughout the island to identify and conserve valuable habitat and reduce operational conflicts.
I.C. Establish acceptable use periods based on the time of year to enhance military training flexibility while maintaining habitat integrity and BMPs.
4.3.3.2 Rocky Intertidal Community
I. Encourage intertidal monitoring at SNI, that is similar to that performed at the other Channel Islands and throughout California, to establish regional trends and understand site specific change.
I.A. Support the compilation and analysis of existing intertidal monitoring data from USGS and other sources.
I.B. Support establishment of scientifically recognized protocols for monitoring locations around SNI in intertidal habitats that represent key indicator species.
I.C. Support annual monitoring of black abalone populations by continuing to conduct density surveys.
I.D. Support GIS mapping of black abalone densities to establish sensitive areas and document trends in recruitment and depletion.
II. Continue to support rocky intertidal monitoring and GIS delineations of rocky intertidal habitat in order to provide site specific information on rocky intertidal species diversity and biogeographic distribution patterns.
II.A. Encourage and support independent scientific research and develop cooperative research agreements focused on recruitment of important indicator species or species of concern.
II.B. Monitor an appropriate set of environmental variables (i.e. water and air temp, nearshore current speed and direction) in order to better understand what is driving the patterns of distribution and abundance.
4.3.3.3 Nearshore Waters - Unvegetated Soft Bottom
I. Encourage and support unvegetated soft bottom monitoring that is performed at SNI and throughout the SCB.
I.A. Support species abundance/diversity surveys to establish general community dominants and baseline conditions.
I.C. Map the extent of unvegetated soft bottom habitat to evaluate the proportion of the habitat in relation to rocky reef habitat and vegetated soft bottom habitat.
I.D. Support multi-beam and Lidar mapping and GIS delineations of subtidal habitat adjacent to SNI to identify habitat types and reduce the potential for operational impacts.
4.3.3.4 Nearshore Waters - Vegetated Soft Bottom
I. Encourage the preservation of vegetated soft bottom (eelgrass) habitat through supporting baseline surveys conducted within SNI waters.
I.C. Support delineations of subtidal habitat to document existing eelgrass beds and habitat to reduce conflicts arising from operational or facility projects.
4.3.3.5 Nearshore Waters - Rocky Reefs and Kelp Forests
I. Support establishment of kelp forest ecosystem monitoring locations around SNI.
I.A. Survey habitats that contain the key indicator invertebrate and fish species associated with kelp forests.
I.D. Utilize scientifically recognized kelp forest ecosystem monitoring protocols to access long term trends in community structure and seasonal variations to ensure ASBS compliance.
II. Encourage state and federal agencies and academic researchers to investigate important community related questions involving recruitment, disturbance, and species diversity that help to access regional trends.
II.A. Support surveys of the federally endangered white abalone to establish the presence/absence of the species within SNI waters.
II.B. Support kelp mapping surveys to examine trends in surface coverage and primary production.
4.4.1 Terrestrial Invertebrates
I. Determine baseline information on the invertebrate community of SNI, with particular emphasis on endemics.
I.A. Consolidate existing information on documented species.
I.B. Add support studies that would inventory insects and also focus on interactions between invertebrates and endemic fauna and flora.
I.B.1. Support completing baseline field surveys for endemic terrestrial invertebrates that focus on understanding endemic invertebrate food resources such as endemic plants and surveys that focus on understanding which endemic invertebrates are utilized by endemic fauna.
I.B.2. Support studies on all federally and state listed endemic plants to determine which invertebrates contribute to their pollination and are essential to their reproduction.
I.B.3. Support completing baseline field surveys that assess interactions between invasive exotic terrestrial invertebrates and endemic flora and fauna.
4.4.2 Reptiles and Amphibians
I. Support regular monitoring of reptiles and amphibians in addition to island night lizard monitoring.
4.4.3 Birds
I.B.2.a. Support efforts to monitor the established point count stations as a long-term standardized population monitoring program by partnering with the USFWS.
I.B.3.a. Investigate the compatibility of the USDA Forest Service (USFS) published guidelines for standardized monitoring techniques for monitoring birds (Ralph *et al.* 1993) for use at SNI.

Table K-1. Natural Resource Management Strategies for Research from Chapter 4 and 5 of the INRMP.

INRMP Management Strategy
I.B.3.b. Determine how current established monitoring programs might contribute to regional databases and monitoring protocols, including the Breeding Bird Survey, Breeding Bird Atlas, Colonial Waterbird Surveys, International Shorebird Survey, Hawk Migration Surveys, Breeding Bird Census, Winter Bird Population Studies, survey information collected locally by federal and state agencies, and the USGS Bird Banding Laboratory. As appropriate, coordinate with Avian Knowledge Network and USDOD e-bird databases to ensure bird monitoring data are submitted.
I.D. Collect and assess information on environmental contaminants and other physical or biological stressors having potential relevance to migratory bird conservation. Where such information is collected in the course of agency actions or supported through federal financial assistance, reasonable efforts shall be made to share such information with the USFWS, USGS-Biological Resources Division, and other appropriate repositories of such data.
II.E. Support biological research of species, interactions with mammalian predators, and impacts from increasing marine mammal presence.
II.K. Investigate use by birds of unused antennae and guy wires, and means to eliminate these as a hazard to migratory birds.
V.A. Support biannual counts (using established methodology) of resident land birds, to determine relative abundance of species during breeding and non-breeding season.
V.A.1. Partner with the USFWS or other organizations when conducting point count surveys in order to support bird inventories for resident land birds.
V.B. Support additional surveys to determine the status of American kestrels.
V.C. Support winter surveys to determine numbers and locations of burrowing owls.
V.D. Investigate breeding bird use areas for land birds through using surveys that require a species-specific research design.
V.D.1. Support studies that investigate the habitat use of orange-crowned warblers on coreopsis or willow-patch.
V.D.2. Support studies that investigate the habitat use of house finches on cactus.
VII.A. Develop a standard format and a database to collect and maintain records of shorebird observations on SNI.
VII.B. Support studies that document the loss of sandy beach habitat to shorebirds as a result of the increased use of those areas by marine mammal pinnipeds.
VII.B.1. Support studies that investigate potential negative interactions between special status avian species such as the western snowy plover and increased use of sandy beach habitat by marine mammal pinnipeds.
VII.E. Determine the status, health, and habitat use of certain target or indicator species not currently listed, including the black oystercatcher.
IX.A. Increase seabird monitoring to capture nesting success.
IX.B. Continue aerial surveys of Brandt's cormorants nesting colonies to determine distribution and breeding population size.
IX.C. Investigate methods to assess distribution of western gull nest sites and reproductive success.
IX.C.1. Support studies that investigate potential negative interactions of the redistribution of western gull nests into western snowy plover habitat.
IX.D. Support outside research of seabird biology, interactions with mammalian predators, and impacts from increasing marine mammal presence.
X.B. Investigate feasibility of fencing cormorant colonies to keep out foxes.
X.C. Continue efforts to remove feral cats from SNI in support of the California WAP recommendation to expand efforts to eradicate introduced predators from all seabird colonies and also in support of the Montrose Settlements Restoration Program Final Restoration Plan to restore seabirds at SNI.
4.4.4 Terrestrial Mammals
I. Support small mammal monitoring programs at SNI that assess home range, movement patterns, and prey abundance for mammalian predators.
I.A. Use the San Nicolas Island deer mouse as an indicator species for a small mammal monitoring program.
II. Support programs that contribute to maintaining endemic populations of the San Nicolas Island deer mouse and the San Nicolas Island fox.
II.A. Continue to focus on mapping populations of the San Nicolas Island fox and San Nicolas Island deer mouse in order to identify their preferred habitat types and subsequently ensure that management measures protect those areas.
III. Support programs to inventory and monitor bat populations on SNI.
4.4.5 Marine Macroalgae and Plants
I. Develop community-level marine macroalgae and plants baseline information.
I.A. Participate in a scientifically recognized program to monitor marine macroalgae and plants.
II.A. Document the extent of existing eelgrass communities.
II.C. Support annual aerial kelp surface coverage monitoring and integrate annual coverages into GIS database.
III. Survey subtidal and intertidal areas near high use locations (piers and barge landing areas) for the introduction of non-native invasive species.
4.4.6 Marine Invertebrates
D. Investigate the potential for remnant populations of white abalone, compile existing information, and document historical occurrences for future NEPA considerations.
4.4.7 Fishes
I. Support the development of a consistent monitoring program to evaluate fish species.
4.4.8. Marine Mammals
III.A. Examine current exclusion practices and propose a pilot exclusion activity focused on excluding pinnipeds from sensitive western snowy plover nesting areas and threatened plant species.
4.5.1.1 Island Night Lizard - Federally Threatened
IV. Support studies to investigate the effectiveness of island night lizard management strategies.
IV.A. Support scientific studies of competition relationships between alligator lizards and island night lizards.
IV.B. Support genetic studies of isolated island night lizard populations to determine population structure and size.

Table K-1. Natural Resource Management Strategies for Research from Chapter 4 and 5 of the INRMP.

INRMP Management Strategy
4.5.1.2 Western Snowy Plover - Federally Threatened
III. Support research to explore the effects of increasing pinniped populations on nesting success of snowy plovers.
4.5.1.3 Black Abalone - Federally Endangered
II.A. Support establishment of rocky intertidal sites on SNI using accepted scientific methodologies to provide complementary data sets documenting trends of key rocky intertidal species assemblages.
II.B. Support scientific studies to investigate recruitment and predation.
II.C. Support the monitoring of key environmental variables that may play an important role in modulating population dynamics.
4.5.1.4 White Abalone - Federally Endangered
I. Support efforts to identify white abalone habitat and densities of individuals around SNI.
I.A. Support regular surveys and integrate historical data sets into SNI databases for management consideration.
I.B. Support mapping of current survey sites to establish functional GIS layers to facilitate management decisions and project review boards.
II.A. Support scientific studies to investigate recruitment and predation.
4.5.1.5 Guadalupe Fur Seal - Federally Threatened
I. Support on-going and new research on distribution and ecology of the Guadalupe fur seal. Encourage academic institutions to facilitate resource data collection.
4.5.2 Management for Other Special Status Species
II.A. Support ongoing and new research on distribution and ecology of species warranting Navy stewardship. Encourage academic institutions to facilitate resource data collection.
4.5.2.1 Special Status Plants - State Endangered, State Threatened, State Rare, and CNPS Rare, Threatened and Endangered
I. Continue to support efforts to conduct an inventory of special status plants on SNI.
I.A. Support vegetation surveys that use the established vegetation monitoring plots.
V. Investigate the potential to restore natural habitat with rare plants whenever the environment it suitable (if necessary).
4.5.2.2 Terrestrial Invertebrates - Federal Species of Concern and CNDDB Extremely Endangered
I.B. Support studies that focus on interactions between invertebrates and endemic fauna and flora.
I.B.1. Support completing baseline field surveys for insects, focusing on special status endemic invertebrate food resources such as endemic plants and surveys that focus on understanding which special status endemic invertebrates are utilized by endemic fauna.
4.5.2.3 Xantus's Murrelet - Federal ESA Candidate
I.A. Support seabird surveys identifying species warranting Navy stewardship known or thought to occur on SNI.
I.B. Support survey of offshore rocks adjacent to SNI to confirm the presence/absence nesting habitat of Xantus's murrelets.
II.A. Support ongoing and new research on distribution and ecology of Xantus's murrelets. Encourage academic institutions to facilitate resource data collection.
4.5.2.4 Ashy Storm Petrel - Federal ESA Candidate
I.A. Support seabird surveys identifying species warranting Navy stewardship known or thought to occur on SNI.
I.B. Support survey of offshore rocks adjacent to SNI to confirm the presence/absence nesting habitat of ashy storm-petrels.
II.A. Support ongoing and new research on distribution and ecology of ashy storm-petrels. Encourage academic institutions to facilitate resource data collection.
4.5.2.7 Southern Sea Otter - Federal ESA Non-Essential Experimental Population
I. Support on-going and new research on distribution and ecology of the southern sea otter at SNI. Encourage academic institutions to facilitate resource data collection.
4.6.1 Terrestrial Invasive Exotic Species
VIII. Support studies that determine if there are impacts from invasive non-native species already present such as non-native snails, alligator lizards, and chukkar.
IX. Investigate and implement methods to control invasive non-native invertebrate species found on SNI.
IX.A. Research control methods for argentine ant and decollete snails.
IX.B. Determine the distribution of argentine ants on SNI.
IX.C. Determine the distribution of decollete snails on SNI.
5.1.2 Adapting to Effects of Climate Change and Regional Growth
II. Identify data and research needs for ensuring an effective response to the consequences of climate change.
II.A. Identify species and communities resilient/vulnerable to climate change impacts by conducting climate change vulnerability assessments.
II.B. Improve the application of models through data collection and validation (as feasible and needed) and for using such science based models in environmental and natural resource management planning.
II.C. Improve the graphical depiction of the potential impacts of climate change scenarios for SNI to address anticipated shifts in species ranges and population abundances in climate change vulnerability assessments.
III.B. Identify restoration projects to provide habitat elements for specific species which may be altered by climate change.
5.1.3 Sustainability in the Built Environment
V. To develop sustainability indicators and best practices, monitor and integrate into SNI planning the work of professional societies, academic institutions, managers, business and government entities on the topic of sustainability with regard to specific disciplines and resource subsets.
V.A. Select sustainability indicators that have the potential to turn the generic concept of sustainability into action.
V.B. Select indicators that improve the quality, regularity of dissemination, and accessibility to the public of sustainability achievement.
V.C. Identify appropriate spatial and temporal resolutions for reporting.
V.D. Consider Life Cycle Assessment as a "composite measure of sustainability." It analyzes the environmental performance of products and services through all phases of their life cycle: extracting and processing raw materials; manufacturing, transportation and distribution; use, re-use, maintenance; recycling, and final disposal.

Table K-1. Natural Resource Management Strategies for Research from Chapter 4 and 5 of the INRMP.

INRMP Management Strategy
V.E. Consider an Environmental Sustainability Index (e.g. Yale Center for Environmental Law and Policy [YCELP], Center for International Earth Science Information Network [CIESIN] of Columbia University, and World Economic Forum and the Directorate-General Joint Research Centre [European Commission] 2004).
5.2 Construction and Facility Maintenance
IV.A. Investigate means to improve successful acquisition of funding for preventive repair of infrastructure, to avoid more environmentally damaging emergency repairs.
5.9 Stormwater Management
I.E.2. Examine location and evaluate need to reposition outfalls in relation to effects on sensitive habitats.
I.F. Target monitoring efforts to evaluate the effectiveness of BMPs and trends in water quality of sub-basins leading into the ocean. Perform adaptive management.
I.F.1. Position monitoring stations at key sites within sub-basins to better track "hot spot" sources of stormwater pollution. Assess results of dry weather and wet weather monitoring.
I.F.2. Evaluate the effectiveness of the applied urban runoff BMPs through the use of a targeted effectiveness and trend monitoring in the watershed.
I.F.3. Continue identifying sources of improper discharges through dry season stormwater monitoring.
I.F.4. Implement a Biological Indicator Development Program to better evaluate the effects of runoff on the nearshore ecosystem.
I.F.5. Re-evaluate the design and use of BMPs based on the results of the monitoring program.
5.10 Remediation of Contaminated Sediments
II.C. Design and implement management practices to prevent the introduction of pathogens to SNI waters.
IV.A. Support monitoring trends in contaminants determined to be present in seafood organisms at levels that may pose significant risks to human consumers.
5.12 Cumulative Effects
I. Standardize the format by which cumulative effects are discussed in environmental documentation (Parry 1990; IPCC Working Group II 2007).
II.C. Identify crucial agents of connection or interaction between habitats that may be affected by projects, such as water/watershed, sediment movement, animal movement, and wind transport.
IV. Support research to improve the adequacy of cumulative effects analysis at predicting when habitat or species effects become significant.
IV.A. Promote research on connections among habitats and species, and the relationship between habitat “quality” and resource use.
IV.B. Support research on the effects of habitat fragmentation, using indicator species.
IV.C. Support research on the minimum size and proximity of habitat parcels as viable habitat for animals of different sizes and dispersal capabilities.
5.12.1 Shoreline Construction
V. Promote experimentation and application of alternative shoreline and underwater habitat structures.
V.C. Identify and prioritize desired ecological function of artificial structures, including: (1) trophic support for native fishes and birds, (2) habitat for migratory birds, (3) nursery/refugia for subtidal species, and (4) habitat for endangered and other special status species.
VI. Promote experimentation and application of alternative LID and habitat-friendly landscaped areas adjacent to the shore.
5.16 Outdoor Recreation
III. Identify and evaluate suitable outdoor recreation opportunities for installation personnel in undeveloped areas that do not contain or have the potential to impact sensitive species.
IV.B. Investigate development of designated hiking trails.
5.17 Environmental Education
VI. Evaluate the effectiveness of existing environmental education programs.

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Appendix L: 2006 Memorandum of Understanding

Memorandum of Understanding among the U.S. Department of Defense and the U.S. Fish and Wildlife Service and the International Association of Fish and Wildlife Agencies for a Cooperative Integrated Natural Resource Management Program on Military Installations (2006)

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MEMORANDUM OF UNDERSTANDING
AMONG
THE U.S. DEPARTMENT OF DEFENSE
AND
THE U.S. FISH AND WILDLIFE SERVICE
AND
THE INTERNATIONAL ASSOCIATION OF FISH AND WILDLIFE AGENCIES
FOR A
COOPERATIVE INTEGRATED NATURAL RESOURCE MANAGEMENT PROGRAM
ON MILITARY INSTALLATIONS

A. PURPOSE

The purpose of this Memorandum of Understanding (MOU) is to establish a cooperative relationship between the U.S. Department of Defense (DoD), the U.S. Department of the Interior, Fish and Wildlife Service (FWS), and the State fish and wildlife agencies as represented by the International Association of Fish and Wildlife Agencies (IAFWA) in preparing, reviewing, and implementing integrated natural resource management plans (INRMPs) on military installations.

B. BACKGROUND

In recognition that military lands have significant natural resources, Congress enacted the Sikes Act in 1960 to address wildlife conservation and public access on military installations. The 1997 amendments to the Sikes Act require the DoD to develop and implement an INRMP for each military installation with significant natural resources. The INRMP must be prepared in cooperation with the FWS and the State fish and wildlife agency (States) and reflect the mutual agreement of the parties concerning conservation, protection, and management of fish and wildlife resources on military lands.

INRMPs provide for the management of natural resources, including fish, wildlife, and plants. They incorporate, to the maximum extent practicable, ecosystem management principles and provide the landscape necessary for the sustainment of military land uses. INRMPs allow for multipurpose uses of resources, including public access necessary and appropriate for those uses, provided such access does not conflict with military land use requirements. Effective partnering among the DoD, the FWS, and the States, initiated early in the planning process at national, regional, and the military installation levels, is essential to the development and implementation of comprehensive INRMPs. When such partnering involves the participation of all parties and synchronization of INRMPs with existing FWS and State natural resource management plans, the mutual agreement of all parties is achieved more easily. Consistent with the use of military installations to ensure the readiness of the Armed Forces, the purpose of INRMPs is to provide for the conservation and rehabilitation of natural resources on military lands. Thus, a clear understanding of land use objectives for military lands should enable DoD, the FWS, and the States to share a common understanding of land management requirements while preparing and reviewing INRMPs.

This MOU addresses the responsibilities of the Parties to facilitate optimum management of natural resources on military installations. It replaces a DoD-FWS MOU on "Ecosystem-based Management of Fish, Wildlife and Plant Resources on Military Lands" which expired May 17, 2004.

C. AUTHORITIES

This MOU is established under the authority of the Sikes Act, as amended, 16 U.S.C. 670a-670f, which requires the Secretary of Defense to carry out a program to provide for the conservation and rehabilitation of natural resources on military installations in cooperation with the FWS and the State fish and wildlife agencies. The DoD's primary mission is national defense. DoD manages approximately 30 million acres of land and waters under the Sikes Act to conserve and protect biological resources while supporting sustained military land use.

The FWS manages approximately 96 million acres of the National Wildlife Refuge System, and administers numerous fish and wildlife conservation and management statutes and authorities, including: the Fish and Wildlife Coordination Act, the Migratory Bird Treaty Act of 1918, the Endangered Species Act, the Marine Mammal Protection Act, the Bald and Golden Eagle Protection Act, the Anadromous Fish Conservation Act, the Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990, the Federal Noxious Weed Act. the Alien Species Prevention Enforcement Act of 1992, the North American Wetland Conservation Act, and the Coastal Barrier Resources Act.

The States in general possess broad trustee and police powers over fish and wildlife within their borders, including – absent a clear expression of Congress' intent to the contrary – fish and wildlife on Federal lands within their borders. Where Congress has given Federal agencies certain conservation responsibilities, such as for migratory birds or species listed as threatened or endangered under the Endangered Species Act, the States, in most cases, have cooperative management jurisdiction.

The Sikes Act (16 U.S.C. 670c-1) allows the Secretary of a military department to enter into cooperative agreements with States, local governments, nongovernmental organizations, and individuals to provide for the maintenance and improvement of natural resources, or to benefit natural and cultural resources research, on DoD installations.

The Sikes Act (16 U.S.C. 670f(b)) also encourages the Secretary of Defense, to the greatest extent practicable, to enter into agreements to use the services, personnel, equipment, and facilities, with or without reimbursement, of the Secretary of the Interior in carrying out the provisions of this section.

The Economy Act (31 U.S.C. 1535 and 1536) allows a Federal agency to enter into an agreement with another Federal agency for services, when those services can be rendered in a more convenient and cost effective manner by another Federal agency.

The Intergovernmental Cooperation Act of 1968 (P.L. 90-577 (82 Stat. 1098)) allows the "improvement of the administration of grants-in-aid to the States, to permit provision of reimbursable technical services to State and local government.

D. RESPONSIBILITIES

The Parties to this agreement hereby enter into a cooperative program of INRMP development and implementation with mutually agreed-upon fish and wildlife conservation objectives to satisfy the goals of the Sikes Act.

1. **The DoD, the FWS and IAFWA (the Parties) mutually agree, in accordance with all applicable Federal, State and local laws and regulations:**

   a. To meet at least annually to discuss implementation of this MOU. The DoD will coordinate the annual meeting and any other meetings related to this MOU. Proposed amendments to the MOU should be presented in writing to the parties at least 15 days prior to the annual meeting. The terms of this MOU and any proposed amendments may be reviewed at the annual meeting. The meeting may also review mutual Sikes Act accomplishments, research and technology needs, and other emerging issues.

   b. To establish a Sikes Act Tripartite Working Group consisting of representatives from the Parties. This Working Group will meet at least quarterly to discuss and develop projects and documents to assist in the preparation and implementation of INRMPs and to discuss Sikes Act issues of national importance.

   c. The Sikes Act Tripartite Working Group will encourage the establishment of INRMP Development and Implementation Teams to facilitate early communication during preparation, review, revision or implementation of an INRMP and to ensure that such INRMPs are comprehensive and implemented as mutually agreed.

   d. Supplemental Sikes Act MOUs or other agreements may be developed at the regional and/or State level.

   e. To recognize the current DoD and FWS Sikes Act Guidelines on http://www.fws.gov and http://www.denix.osd.mil as the guidance for communication and cooperation of the Parties represented by this MOU.

   f. That none of the Parties to the MOU is relinquishing any authority, responsibility, or duty as required by law, regulation, policy, or directive.

g. To engage in sound management practices for natural resource protection and management pursuant to this MOU with due regard for military readiness, the welfare of the public, native fish and wildlife, threatened and endangered species, and the environment.

h. Consistent with DoD's primary military mission and to the extent reasonably practicable, to promote the sustainable multipurpose use of natural resources on military installations, to include hunting, fishing, trapping, and nonconsumptive uses such as wildlife viewing, boating, and camping.

i. To designate the individuals listed below as the national representative from each signatory to participate in the activities pursuant to this MOU. Representatives may also be designated at the regional and local levels to participate in similar Sikes Act planning or coordination activities.

    i. DoD: Conservation Team Leader, ODUSD (I&E) EM, 1225 Clark Street Suite 1500, Arlington, VA 22202-4336

    ii. FWS: National Sikes Act Coordinator, U.S. Fish and Wildlife Service, 4401 North Fairfax Drive, Room 400, Arlington, VA 22203.

    iii. IAFWA: Executive Vice-President, IAFWA, 444 North Capitol Street, NW, Suite 544, Washington, DC 20001.

2. DoD agrees to:

a. Communicate the establishment of this MOU to all DoD Components.

b. Take the lead in the development of policies related to INRMP development and implementation and seek the cooperation of the FWS and the State fish and wildlife agencies during development, review, and implementation.

c. Ensure distribution of the DoD and revised FWS Sikes Act Guidelines to all appropriate DoD offices at every level of command.

d. Encourage military installations to invite appropriate FWS and State fish and wildlife agency offices to participate in developing and updating the INRMPs. All such invitations should be extended well in advance of the needed date for the product or work in order to facilitate meaningful participation by all three Parties.

e. Encourage military installations to take advantage of FWS and State fish and wildlife agency natural resources expertise through the use of Economy Act transfers and cooperative agreements. Priority should be given to projects that:

i. Sustain the military mission;

ii. Consider the strategic planning priorities of the FWS and the State fish and wildlife agency; and

iii. Effectively apply the principles of ecosystem management.

f. Encourage military installation to identify INRMP project requirements and give priority to those that:

i. Ensure conservation of natural resources while sustaining military mission activities;

ii. Achieve compliance with Federal, State, and local laws; and

iii. Provide adequate staffing for the development and implementation of the INRMP.

g. Discuss with the FWS and the State fish and wildlife agencies all issues of mutual interest related to the protection, conservation, and management of fish and wildlife resources on DoD installations, and obtain the mutual agreement of the FWS and the States regarding all INRMP provisions related to activities within their legal jurisdiction.

h. Subject to mission, safety and security requirements, provide public access to military installations to facilitate the sustainable multipurpose use of its natural resources.

i. Identify DoD natural resource research needs, and develop research proposals with input from FWS and/or the IAFWA.

j. Encourage the Military Services to establish natural resources management liaisons to facilitate:

i. Coordination and mutual agreement of INRMPs;

ii. Development and implementation of cooperative regional and local natural resource conservation partnerships and conservation initiatives with FWS and State fish and wildlife agency offices; and

iii. Natural resources conservation technology transfer and training initiatives between the Military Services, Federal land management agencies, and State fish and wildlife agencies.

3. **FWS agrees to:**

   a. Communicate the establishment of this MOU to each FWS Regional Office and appropriate field stations in close proximity to military installations.

   b. Distribute the DoD and revised FWS Sikes Act Guidelines to each FWS Regional Office and appropriate field station in close proximity to military installations.

   c. Designate regional and field station FWS liaisons to develop partnerships and assist the DoD in implementing joint management of ecosystem-based natural resource management programs.

   d. Identify FWS personnel needs for the development, review, updating, and implementation of INRMPs and expedite the fulfillment of those needs, as appropriate, based on funding and FWS priorities.

   e. Provide technical assistance to the DoD in managing Federal trust resources such as endangered species, migratory birds, interjurisdictional fisheries, invasive species, contaminants, wetlands, coastal resources, law enforcement, or other natural resource issues within the scope of FWS responsibilities, funding constraints and expertise.

   f. Work with the DoD to coordinate military natural resource research efforts and the creation of a consolidated source of information, with a particular emphasis on research on listed species and species at-risk.

   g. Disseminate upcoming proposed listing and critical habitat designations to DoD Headquarters offices and potentially affected installations as part of outreach efforts before the Federal Register publication of such proposed designations.

   h. Provide law enforcement support to protect fish, wildlife and plant resources on military installations within the jurisdiction of the FWS.

4. **IAFWA agrees to:**

   a. Communicate the establishment of this MOU to each State fish and wildlife agency director and appropriate field offices.

   b. Distribute the DoD and revised FWS Sikes Act Guidelines to each State fish and wildlife agency director and appropriate field offices.

   c. Facilitate and coordinate with the States to encourage them to:

i. Participate in the development, review, updating and implementation of INRMPs upon request of military installations.

ii. Designate State liaisons to assist in developing partnerships and to assist the DoD in implementing natural resource conservation and management programs.

iii. Identify State wildlife management areas in close proximity to military installations and, where appropriate, participate in the joint management of ecosystem-based natural resource management projects.

iv. Provide technical assistance to the DoD in managing natural resource issues such as endangered species, migratory birds, interjurisdictional fisheries, invasive species, contaminants, wetlands, coastal resources, law enforcement, outdoor recreation, or other natural resource issues within the scope of State responsibility and expertise.

v. Identify State personnel needs for the development, review and implementation of INRMPs and expedite the fulfillment of these needs as appropriate based on available funding and State priorities.

vi. Coordinate current and proposed State natural resource research efforts with those that may relate to DoD installations.

vii. Coordinate with DoD installations in development of comprehensive state wildlife conservation plans.

E. STATEMENT OF NO FINANCIAL OBLIGATION

This MOU does not impose any financial obligation on the part of any signatory.

F. ESTABLISHMENT OF COOPERATIVE AGREEMENTS

The Parties are encouraged to enter into cooperative agreements to coordinate and implement natural resource management on military installations. If fiscal resources are to be transferred in support of this MOU, the Parties must develop a separately funded cooperative agreement. Such cooperative agreements may be entered into under the authorities of the Sikes Act (16 U.S.C. 670a-670f, as amended) and the Economy Act (31 U.S.C. 1535 and 1536). Each funded cooperative agreement shall include a work plan and a financial plan that identify goals, objectives, and a budget and payment schedule. A cooperative agreement to accomplish a study or research also will include a study design and methodology in the work plan. It is understood and agreed that any monies allocated via these cooperative agreements shall be expended in accordance with its terms and in the manner prescribed by the fiscal regulations and/or administrative policies of the party making the funds available.

G. AMENDMENTS

This MOU may be amended at any time by mutual agreement of the parties in writing.

H. TERMINATION

Any party to this agreement may remove itself from this MOU upon sixty (60) days written notice to the other parties.

I. EFFECTIVE DATE AND DURATION

This MOU will be in effect upon date of final signature and will continue for five years from date of final signature. The parties will meet 6 months prior to the expiration of this MOU to discuss potential modifications and renewal terms.

1/31/06 — Alex A. Beehler
Date
Assistant Deputy Under Secretary of Defense
(Environment, Safety and Occupational Health)
U.S. Department of Defense

1/31/06 — H. Dale Hall
Date
Director
Fish and Wildlife Service
U.S. Department of Interior

1/31/06 — [signature]
Date
Executive Vice-President
International Association of Fish and Wildlife Agencies